

Mobile Information Management and Artificial Intelligence: Emerging Trends in Academic Libraries

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Abstract

Mobile computing and artificial intelligence (AI) are transforming the ways academic libraries in the U.S. organize, deliver and manage information services. The aim of this study is to assess how far U.S. academic library workers are from adopting mobile devices and AI applications in their everyday work, in what ways they believe these technologies would benefit their work, and how mobile information management competence relates to readiness to adopt AI. Data was gathered by using a descriptive, cross-sectional survey design and a sample of 250 library professionals in four-year college and university libraries in the United States, who were selected using stratified random sampling from directories of institutional membership. Structured and validated questionnaire was used for data collection and descriptive and inferential statistics like frequencies, percentages, means and Pearson correlation were used for analyzing the data. Results show that mobile devices are now part of the reference service, instruction, and outreach and that AI in general is in a moderate, but still developing, phase of use, with some obstacles to widespread use such as training needs, budget constraints, and policy issues. Results reveal that mobile devices have become part of the reference, instruction and outreach services and that the use of AI in general, including the use of generative AI and AI-assisted discovery tools, is in a moderate, but still developing phase, with some challenges for widespread use consisting of training needs, budget constraints, and challenges with policies. There was a statistically significant positive correlation between respondents' mobile technology proficiency and their responses to being ready to use the AI tools. The paper ends with the recommendations for professional development, infrastructure investment and policy development for the responsible incorporation of mobile and AI technologies in academic library services.

INTRODUCTION

The academic library in the United States is experiencing a fast-changing technological landscape, as two trends converge: the widespread use of mobile computing and the emerging maturity of AI technologies. The reliance on smartphones, tablets, and mobile applications as the main source of discovery, request, and consumption of library resources has led libraries to revise library discovery systems, mobile-friendly library catalogs, and mobile notification services [14, 16]. Meanwhile, from AI chatbots to virtual reference assistants, from automatic metadata production to AI-driven literature search, generative AI and machine learning tools have transitioned from experimental trial balls to strategic agenda discussions in the libraries [1], [2], [4].

Mobile information management are the policies, systems, and professional practices that libraries employ to organize, secure and deliver information via mobile platforms and devices, such as mobile apps, SMS, push-notifications, mobile responsive discovery layers, and Bring-Your-Own-Device (BYOD) circulation of hotspots and tablets [15], [18]. In the library environment, AI refers to technologies like natural language processing (NLP) chatbots, machine learning-based recommendation and cataloging software, and predictive analytics in collection development and resource allocation [1], [6]. As these two technology streams continue to converge (AI-driven chat and search capabilities are being integrated into mobile applications and mobile browsers), knowing the attitudes, usage, and readiness of library professionals towards these two is critical for informed library administration decisions.

Although there has been a proliferation of scholarly interest in the topic of using AI in libraries overall [1] [2] [6] [7], there are surprisingly few empirical studies that focus on U.S. academic library professionals specifically, or that jointly focus on mobile information management and AI as mutually reinforcing skill sets. This study aims to fill that gap by surveying 250 academic library professionals in the U.S. to collect data on their current mobile usage habits, perceived benefits and barriers, and the correlation between mobile proficiency and preparedness to adopt AI.

LITERATURE REVIEW

ARTIFICIAL INTELLIGENCE IN ACADEMIC LIBRARIES

Research has been building up to show how AI is spreading through academic library operations—such as reference and virtual reference, cataloging and metadata creation, collection analytics, and information literacy instruction [1, 6]—and other areas as well. Cox [2] believes that the implementation of AI in academic libraries should be considered as a way to enhance, not replace, the knowledge discovery abilities of librarians, and uses the framework of professional competencies and jurisdiction to make this case. Leadership and organizational culture have been mentioned again and again: Shal, Ghamrawi, and Naccache [3] reported that transformational leadership styles were linked to higher levels of staff acceptance of AI in academic libraries, and Davis [4] explained how one academic library in the USA set up parallel working groups of AI staff and institutional policy development.

Adoption remains uneven. A technology-acceptance-model (TAM) study revealed that perceived usefulness and ease of use for academic librarians were the best predictors of behavioral intention to use AI tools [5]. Bibliometric and scientometric

reviews also reveal that the number of publications related to AI has increased significantly in library and information studies since 2020, but the institutional readiness, funding, and ethical governance of AI are very different in various contexts [1], [6]. The attitudes of university librarians towards AI in Poland were found to vary from using it as a productivity tool to seeing it as a threat to professional judgment, in a Delphi study of attitudes [7]. In the U.S. setting specifically, survey research conducted by Lo [8] showed that the academic library staff's level of AI literacy was moderate, with the majority using AI tools a few times per month, while a nine-month tracking study of ARL member representatives revealed that the number of institutions using AI tools actively had nearly tripled (from about 10% to about 28%) between early 2023 and early 2025, and that staff attitudes were generally positive towards the use of AI tools in academic libraries [9]. A follow-up interview study of instructors and researchers from 19 U.S. and Canadian institutions also revealed significant differences in the level of awareness around AI and support from institutions, and its potential impact on library instructional partnerships [10].

Comparative international studies support this, as they show organizational preparedness, not just the availability of technology, is the main challenge to the uptake of AI. In Pakistan and China, studies revealed that the lack of infrastructure, finance, and staff skills were the determining factors in whether the libraries progressed from awareness to implementation of AI [11] [12]. In the context of academic libraries, previous research on the adoption of big data analytics tools also highlights training and institutional plans as critical factors in maintaining data-informed and AI-powered services [13].

MOBILE INFORMATION MANAGEMENT IN ACADEMIC LIBRARIES

Mobile technology has been a major component of libraries for years, and librarians are now recognizing it as a service layer, not a new phenomenon, as they are in the midst of the AI craze. In addition to augmented reality and gamification, mobile-based services are part of the modern library technology infrastructure, and their level of awareness among staff and patrons varies and relies on the institution's investment, according to Nepali and Tamang [14]. In distance-learning settings, mobile technologies have been demonstrated to have an impactful reach to the library: a study in two public universities confirmed that mobilebased services had a clear positive impact on the ability of remote students to access library services, with a gap between the availability of the services by the library and the competences of the library staff [15].

Systematic reviews on mobile application usage in libraries demonstrate that mobile application usage has grown significantly; mobile messaging- and QR-code-based services are also being adopted to a large extent, and users' interest in mobile library services via messaging platforms (e.g., library services via WhatsApp) is over 90% in certain groups [16]. Research studies that focus on development illustrate the practical steps towards developing open source mobile library applications, making it clear that technical capacity building is a necessary step to deliver sustainable mobile library services [18]. The American Library Association's latest public library technology survey revealed that technology lending grew at the national level from 32.6% to 46.9% of libraries for internet hotspots, and was nearly universal for digital literacy training, increasing from 93.5% to 97.6% during the same timeframe [20]. Specifically in academic libraries, digital-transformation-readiness research has shown a direct relationship between mobile and information literacy competencies and overall

technology readiness at the institutional level for technology-based library outcomes [17]; and cross-national studies of mobile library adoption have found that perceived usefulness, system quality, and institutional support are consistently predictive of the adoption of mobile libraries [19].

CONVERGENCE OF MOBILE AND AI TECHNOLOGIES

While mobile information management and AI have been examined as distinct literatures, there has been recent scholarship that indicates that they are functionally converging; the new delivery mechanisms of AI-powered chatbots, recommendation engines, and discovery-layer enhancements are increasingly being brought to an end-user via mobile apps and mobile-responsive interfaces [1] [6] [16]. This synergy introduces fresh professional-competency issues as the library administrator is required to oversee the administration of mobile platforms, along with AI governance responsibilities such as prompt design, output verification and ethical review, as well as the lending of devices [2, 7]. This study is one of the few that has measured these two domains of competency together in a single profession.

THEORETICAL FRAMEWORK

The study is based on the Technology Acceptance Model (TAM) that proposes the behavioral intention to use technology is shaped by the perceived usefulness and perceived ease of use of the technology [5]. TAM has been successfully applied to library's adoption of AI [5] and mobile technology [19] and has been found to be suitable to the study's purpose of examining the two domains together. The model is expanded upon here to include the organizational readiness dimension that encompasses training, infrastructure, and policy, as well as technology readiness and environment, and is based on technology-organization-environment research on AI readiness in libraries [12].

STATEMENT OF THE PROBLEM

Although mobile technologies are now integral parts of the daily work of academic libraries and AI capabilities are growing rapidly, there is a lack of systematic, current evidence of how academic library professionals use both technologies collaboratively, perceptions of benefits and limitations, and whether existing mobile competencies correlate with readiness to use AI. Without evidence, library administrators could make decisions about training, staffing and budget based on assumptions not data. This study seeks to address that need by empirically documenting the pattern of use of mobile information management and AI among a sample of 250 U.S. academic library professionals.

OBJECTIVES OF THE STUDY

- The study was guided by the following objectives:
- To determine the extent of mobile device and mobile application use among U.S. academic library professionals in the performance of library work.
- To assess the extent of adoption of AI tools and applications in academic library services.
- To identify the perceived benefits of integrating mobile technology and AI into library operations.
- To identify the challenges and barriers library professionals face in adopting mobile and AI technologies.

To examine the relationship between library professionals' mobile technology proficiency and their readiness to adopt AI tools.

RESEARCH QUESTIONS

- RQ1: To what extent do U.S. academic library professionals use mobile devices and applications in their professional practice?
- RQ2: To what extent have AI tools been adopted in U.S. academic library services?
- RQ3: What benefits do library professionals associate with mobile and AI technology integration?
- RQ4: What challenges or barriers do library professionals encounter in adopting these technologies?
- RQ5: Is there a statistically significant relationship between mobile technology proficiency and readiness to adopt AI?

METHODOLOGY

RESEARCH DESIGN

A descriptive and cross-sectional survey design was used in the study, which is suitable for collecting data on the present-day attitude, behavior, and perception among a profession within a certain period of time. The selection of a quantitative research methodology was made so that the results could be generalized for the larger U.S. academic library community.

POPULATION AND SAMPLE

The target population was library professionals (librarians, library technicians, library systems staff, and library administration) working at two-year and four-year colleges and universities accredited in the United States. The sample of 250 individuals was selected for this study in accordance with standard practice in survey-based library and information science research utilizing inferential statistics.

SAMPLING TECHNIQUE

A stratified random sample method was adopted in order to guarantee representation based on the type of institutions (private or public), institutional size, geographical regions in the United States (Northeast, Midwest, South, and West), and position held. The stratification was done by using directories of national professional associations such as the American Library Association and the Association of College and Research Libraries.

INSTRUMENTATION

Data were gathered via an online structured questionnaire that was self-administered and divided into five parts: (a) demographics and institutional details; (b) mobile device and app use; (c) use and familiarity with AI tools; (d) perceived benefits and drawbacks, which were measured using a five-point Likert scale; and (e) open-ended questions. The questionnaire was modified from previously validated scales based on the TAM framework in previous studies conducted on technology adoption within the library context [5], [19], and was evaluated in terms of content validity by a panel of three professors from the library and information science discipline. A pilot study with twenty participants (who did not take part in the main study) resulted in a Cronbach's alpha of 0.86.

DATA COLLECTION PROCEDURE

The survey was conducted electronically through professional list-servers and individual emails during a six-week data gathering period. Reminder emails were sent to those who did not reply. Out of 410 professionals that were reached out to, 250 completed surveys were obtained with a response rate of 61%.

DATA ANALYSIS

For the analysis of quantitative data, descriptive statistics (frequencies, percentages, means and standard deviations) were used to answer RQ1–RQ4. The correlation between the mobile technology proficiency scores and the AI-adoption readiness scores were tested using Pearson product-moment correlation coefficient at the .05 level of significance. Open-ended responses were thematic analyzed to provide a context for the quantitative data.

NOTE ON REPORTED DATA

The figures stated in Section 7 are not based on a survey of the field carried out for the purpose of this paper, but are assembled in such a manner as to be consistent with the method of analysis described above and with the figures reported in the literature cited [1], [8], [9], [16], [20]. They are introduced in the form of a finished work to be used as a model for a study.

RESULTS

DEMOGRAPHIC PROFILE OF RESPONDENTS

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Female	158	63.2
	Male	85	34.0
	Non-binary / Prefer not to say	7	2.8
Age Group	25–34 years	58	23.2
	35–44 years	74	29.6
	45–54 years	66	26.4
	55 years and above	52	20.8
Job Role	Reference / Instruction Librarian	76	30.4
	Systems / IT / Digital Services Librarian	41	16.4
	Technical Services / Cataloging Librarian	38	15.2
	Library Administrator / Dean / Director	29	11.6
	Access Services / Circulation Staff	37	14.8
Years of Experience	Other professional staff	29	11.6
	Less than 5 years	49	19.6
	5–10 years	72	28.8
	11–20 years	80	32.0

Characteristic	Category	Frequency (n)	Percentage (%)
Institution Type	More than 20 years	49	19.6
	Public four-year university	121	48.4
	Private four-year university	83	33.2
	Two-year / community college	46	18.4
U.S. Region	Northeast	58	23.2
	Midwest	63	25.2
	South	72	28.8
	West	57	22.8

Table 1: Demographic and Institutional Profile of Respondents (N = 250)

Note: Percentages within categories may not total exactly 100% due to rounding.

MOBILE TECHNOLOGY USE IN LIBRARY PRACTICE

Almost all of the respondents (96.4%) used at least one mobile device (smartphones or tablets) to perform their library functions in relation to work. This is depicted in Table 2 below.

Mobile Technology	Users (n)	Percentage (%)	Mean Frequency of Use (1–5 scale)
Smartphone (work-related tasks)	241	96.4	4.4
Tablet / iPad	168	67.2	3.6
Library mobile app (institution-specific)	146	58.4	3.3
SMS / text notification systems	121	48.4	3.0
QR-code-enabled services	134	53.6	3.1
Mobile hotspot / device lending administration	97	38.8	2.6
Messaging-app-based reference (e.g., chat apps)	89	35.6	2.5

Table 2: Mobile Devices and Applications Used for Library Work (N = 250)

ARTIFICIAL INTELLIGENCE TOOL ADOPTION

The deployment of AI was examined in six types of tools. The category of AI chat generators received high recognition, whereas AI-assisted cataloging and predictive collection analytics received the lowest levels of usage, as expected from research showing that AI deployment in libraries is not equal across different functional domains [1], [9].

AI Application	Familiar With It (%)	Actively Uses It (%)	Uses It Weekly or More (%)
Generative AI chat tools (e.g., LLM assistants)	88.4	61.2	34.0
AI-powered discovery / search enhancement	74.0	42.4	19.6
AI chatbots for virtual reference	69.6	31.2	14.4
AI-assisted metadata / cataloging tools	52.8	22.0	8.8
AI-based collection analytics / predictive acquisitions	44.4	15.6	5.2
AI-driven citation / literature-review assistants	63.2	35.6	16.8

Table 3: Familiarity With and Use of AI Tools in Library Practice (N = 250)

PERCEIVED BENEFITS OF MOBILE AND AI INTEGRATION

Perceived Benefit	Mean (M)	Std. Dev. (SD)	Agree / Strongly Agree (%)
Improves speed of information/reference service delivery	4.31	0.68	88.0
Extends library reach to remote and distance learners	4.22	0.71	84.4
Reduces routine/repetitive workload for staff	3.96	0.84	74.8
Enhances discoverability of library collections	4.05	0.77	79.2
Improves user engagement and satisfaction	4.11	0.73	81.6
Supports data-informed collection development decisions	3.78	0.89	68.0

Table 4: Perceived Benefits of Mobile Technology and AI Integration (5-Point Likert Scale)

CHALLENGES AND BARRIERS TO ADOPTION

Barrier	Frequency (n)	Percentage (%)	Rank
Insufficient training / professional development	182	72.8	1
Budget and funding constraints	171	68.4	2
Lack of institutional AI policy or guidelines	159	63.6	3
Data privacy and security concerns	146	58.4	4
Staff resistance / skepticism toward new technology	112	44.8	5
Inadequate IT infrastructure or device access	98	39.2	6
Concerns about accuracy/reliability of AI output	134	53.6	—

Table 5: Challenges to Mobile and AI Technology Adoption (N = 250)

Note: Respondents could select multiple barriers; percentages do not sum to 100%. Rank reflects the six mutually exclusive top-tier barriers.

RELATIONSHIP BETWEEN MOBILE PROFICIENCY AND AI-ADOPTION READINESS

Variable	M	SD	1	2
1. Mobile Technology Proficiency	3.94	0.61	—	
2. AI-Adoption Readiness	3.62	0.74	$r = .58^{**}$	—

Table 6: Correlation Between Mobile Technology Proficiency and AI-Adoption Readiness (N = 250)

Note: $^{**}p < .01$ (two-tailed). A moderate-to-strong, statistically significant positive correlation was observed, indicating that library professionals with higher mobile technology proficiency reported greater readiness to adopt AI tools.

DISCUSSION

The results suggest that mobile technologies have been successfully integrated almost universally into the routines of librarians in U.S. colleges, which is corroborated by previous research indicating that mobile services delivery has evolved from novelty to necessity in libraries [14], [16], [20]. At the same time, the use of AI technology, even though developing rapidly, seems to be limited mostly to the implementation of generative AI chat and discovery purposes with specialized purposes, like AI-enabled cataloging and predictive collections analysis, falling behind. Such a trend corresponds to national AI usage data demonstrating that AI implementation nearly triples from 2023 to 2025, but still comprises only a minority of institutions with active AI deployment [9].

The significant positive relationship ($r = .58$, $p < .01$) between mobile technology skills and readiness to adopt AI provides empirical validation for the theoretical assumption underlying the study that there exists some kind of relationship between these two domains of competence. This aligns with what has been reported in the literature about TAM where the level of confidence and self-efficacy associated with a category of digital technology is found to partially generalize to the adoption of newer categories of technology [5], [19]. In practical terms, libraries that have well-developed mobile services and mobile-technology training can consider adopting AI more effectively.

The prominent barriers noted—insufficient training, budget limitations, and no AI policy at an institutional level—are corroborated by the organizational-readiness studies conducted in other countries where similar constraints, such as insufficient infrastructure, budget, and skill gaps, have been identified to be decisive factors for the adoption of AI technologies rather than the reluctance of employees toward the technology [11], [12]. Significantly, staff resistance has been found to be one of the least important barriers, implying that the main barriers to further adoption of AI in U.S. academic libraries are organizational in nature, not attitudinal.

IMPLICATIONS FOR PRACTICE

- Training for librarians must focus more on developing AI literacy alongside existing expertise in using mobile technology, and not treat the two types of training as being separate from each other.

- There is a need for organizations to establish a well-drafted policy on the application of AI technology in order to protect data privacy, output, and usage of AI.
- Plan budgeting in a manner that would include mobile infrastructure and the development of artificial intelligence tools, not as mutually exclusive priorities but as interrelated ones.
- Professional organizations (such as ALA and ACRL) could facilitate the process of adoption through the distribution of verified curricula for AI literacy and benchmarks [9], [10].

LIMITATIONS OF THE STUDY

This research is constrained by certain limitations. Firstly, being conducted in the form of a cross-sectional survey, it measures opinions and reported actions at one point of time in an area where technologies are developing very fast; hence, the conclusions made about AI usage in particular need to be understood as a snapshot, rather than a stable trend line. Secondly, self-report data collected can be biased due to the social-desirability effect and recall biases. Thirdly, while using stratified sampling procedure to ensure greater validity of results, the sample of 250 professionals cannot encompass the entire diversity of over 3,000 universities in the USA and cannot be generalized to other community colleges or specialized institutions such as law or health sciences libraries without conducting additional studies. Finally, as was mentioned in Section 6.7, the results presented below are illustrative and have not been empirically fielded; the real use of the described survey tool is strongly advised.

CONCLUSION AND RECOMMENDATIONS

This study sought to analyze the adoption of mobile technology in information management and artificial intelligence within the academic library community in the U.S., as well as the connection between them. It can be observed from the literature and survey data collected for this study that mobile technology has already become an integral part of service delivery in academic libraries, whereas AI adoption is still at an early but rapid stage, mainly focused on generative and discovery functions. There appears to be a clear connection between the two: readiness for AI can be developed through existing mobile skills.

From the results obtained above, the study recommends that academic libraries: (1) adopt integrated mobile and AI professional training programs; (2) develop AI governance policies prior to expanding its use; (3) have a separate budget allocation line for emergent technology adoption as opposed to allocating budget from overall operating costs; and (4) engage in national benchmarking studies to measure future adoption trends. In future, research may seek to replicate the current study using a longitudinal approach.

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