

Transforming Library Services Through Automation and Digital Technologies: A Systematic Literature Review of Integrated Library Systems, Digital Libraries, Library Management, and Technology Adoption

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ABSTRACT

Libraries around the world are changing rapidly as new technologies, digital tools, and user needs evolve. Automation systems, integrated library systems, digital libraries, and other technologies are changing how libraries are managed. While many studies have looked at automation, digital transformation, and technology use across various types of libraries, the research is scattered across different settings and tools. This systematic review gathers recent studies on how technology affects library management. The review followed PRISMA 2020 guidelines and used a PICOC-based search strategy. Studies published from 2020 to 2026 were found through a systematic database search. The selection and evaluation of studies were guided by specific inclusion and exclusion criteria. After screening and quality checks, fourteen studies were included, covering academic, public, special, digital, and research libraries. The results show that using technology improves efficiency, resource management, access, and service delivery. Integrated Library Systems support cataloging, circulation, and resource management, while digital libraries and cloud platforms make information easier to access and support remote services. Technology also helps libraries evolve by reshaping librarian roles and fostering innovation. New technologies such as artificial intelligence and cloud computing are increasingly impacting libraries, and virtual reality is helping transform modern library spaces. However, challenges remain, including limited infrastructure, a lack of skills, funding issues, and organizational readiness for change. This review shows that automation, digital libraries, and technology are the main drivers of change in library management. The findings provide evidence to guide technology use and organizational change and support the implementation of technology frameworks in today's libraries.

Keywords: Library automation; Integrated Library Systems (ILS); Digital libraries; Technology adoption; Library management

INTRODUCTION

The rapid adoption of digital technologies has transformed how libraries manage resources and deliver services. Library automation, Integrated Library Systems (ILS), digital libraries, cloud computing, and other technology-driven solutions have improved cataloging, circulation, information access, and service efficiency while supporting the growing demand for digital and remote services (Ashiq et al., 2022; Ayeni et al., 2021; Omeluzor, 2020). Emerging technologies such as artificial intelligence and virtual reality are further expanding opportunities for innovation in library operations and user engagement (Hosseini & Holmes, 2023; Roy et al., 2022).

Despite these developments, existing research is fragmented across different technologies and library contexts, making it difficult to obtain a comprehensive understanding of how technological innovations collectively influence library management and service delivery. Most studies examine individual tools or specific implementation cases rather than providing an integrated synthesis of their organizational and operational impacts

To address this gap, this systematic literature review synthesizes recent evidence on library automation, integrated library systems, digital libraries, and technology adoption in contemporary library environments. The review examines how these technologies contribute to operational efficiency, information accessibility, service innovation, and organizational adaptation while identifying common benefits, challenges, and technology integration practices. The findings provide evidence-based insights to support librarians, administrators, policymakers, and researchers in planning and implementing technology-driven initiatives for modern library services

The study was guided by the research question:

How do library automation, integrated library systems, digital libraries, and technology adoption drive the transformation of library management and service delivery through technological implementation, organizational adaptation, and technology integration frameworks in contemporary library environments?

The findings of this review contribute to Library and Information Science research by consolidating evidence on technological innovation, organizational adaptation, and service transformation in libraries. The review also provides practical implications for library managers, information professionals, policymakers, and researchers involved in technology planning and digital transformation initiatives within library environments.

METHODS

Research Design

This study employed a qualitative Systematic Literature Review (SLR) design to synthesize contemporary evidence regarding the influence of library automation, integrated library systems, digital libraries, and technology adoption on library management and service delivery. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework to ensure transparency, methodological rigor, and reproducibility throughout the review process. The systematic review methodology was selected because it enables comprehensive identification, evaluation, and synthesis of existing scholarly evidence while minimizing bias in study selection and interpretation.

The review process consisted of five major stages: literature identification, screening, eligibility assessment, quality assessment, and qualitative synthesis. A structured search strategy guided by the PICOC framework was employed to identify relevant studies. Inclusion and exclusion criteria were applied systematically to ensure that only studies directly addressing the research question were retained for synthesis. The final stage involved thematic analysis to identify recurring patterns, technological trends, organizational adaptations, benefits, challenges, and technology integration frameworks reported in the included studies.

Formulation of Research Question

The research question was developed in response to the increasing adoption of library automation, integrated library systems (ILS), digital libraries, and other emerging technologies that are transforming library management and service delivery. Although previous studies have examined these technologies individually, the evidence remains fragmented across different contexts and lacks a comprehensive synthesis of their collective impact on library operations and organizational adaptation.

To address this gap, this systematic literature review investigates how technological innovations influence library management, service delivery, and organizational change. The review also examines the benefits, challenges,

and technology integration practices reported in contemporary library environments, providing a broader understanding of digital transformation in libraries.

Guided by the research question:

How do library automation, integrated library systems, digital libraries, and technology adoption drive the transformation of library management and service delivery through technological implementation, organizational adaptation, and technology integration frameworks in contemporary library environments?

The PICOC framework was employed to further refine the research question and ensure alignment among the study objectives, search strategy, inclusion and exclusion criteria, and data synthesis procedures. The research problem was structured to address technological implementation, service transformation, organizational adaptation, benefits, challenges, and framework development in contemporary library and information environments. This study contributes to the Library and Information Science literature by synthesizing information on library automation, integrated library systems, digital libraries, technology adoption, and digital transformation. The findings have practical significance for librarians, library managers, policymakers, and researchers in formulating strategies for integrating technology and innovating services in contemporary library settings.

Table 1. PICOC Framework for RQ

PICOC Element	Description
Population (P)	Libraries, librarians, library staff, library users, academic libraries, public libraries, special libraries, digital libraries
Intervention (I)	Library automation, Integrated Library Systems (ILS), Library Management Systems (LMS), digital library technologies, information and communication technologies (ICT), cloud-based library systems, smart library technologies
Comparison (C)	Traditional/manual library operations versus automated and digital library systems; pre-adoption versus post-adoption environments
Outcome (O)	Improved library management, operational efficiency, service quality, user satisfaction, resource accessibility, organizational adaptation, digital transformation, technology acceptance
Context (C)	Academic libraries, public libraries, special libraries, digital libraries, smart libraries, higher education institutions, information centers

Table 1 presents the PICOC framework, which guided the evaluation of how library automation, integrated library systems, digital libraries, and technology adoption influence library management and service delivery. The framework identifies libraries, librarians, library staff, and library users as the primary stakeholders, as these groups are directly impacted by technological advancements and digital transformation initiatives within library environments. The intervention centers on library automation technologies, including Integrated Library Systems (ILS), Library Management Systems (LMS), digital libraries, information and communication technologies, cloud-based platforms, and smart library technologies, all aimed at modernizing library operations and services.

The comparison component of the evaluation facilitated the investigation of differences between traditional manual library operations and technology-enabled library environments, as well as changes observed before and after technology implementation. The outcome element identified key indicators of successful technology adoption, such as improved library management, operational efficiency, service quality, and user satisfaction, access to information resources, organizational adaptation, digital transformation, and technology acceptance. The context encompasses academic, public, special, digital, and smart libraries, higher education institutions, and information centers, where technological advancements are transforming service delivery and organizational processes.

The PICOC framework was instrumental in guiding the development of the search strategy, screening procedures, inclusion and exclusion criteria, quality assessment process, and thematic synthesis. This approach ensured alignment with the research aims and enabled a systematic investigation of the impact of technological implementation on library management and service provision in contemporary library settings.

Figure 1. PRISMA 2020 Framework Model

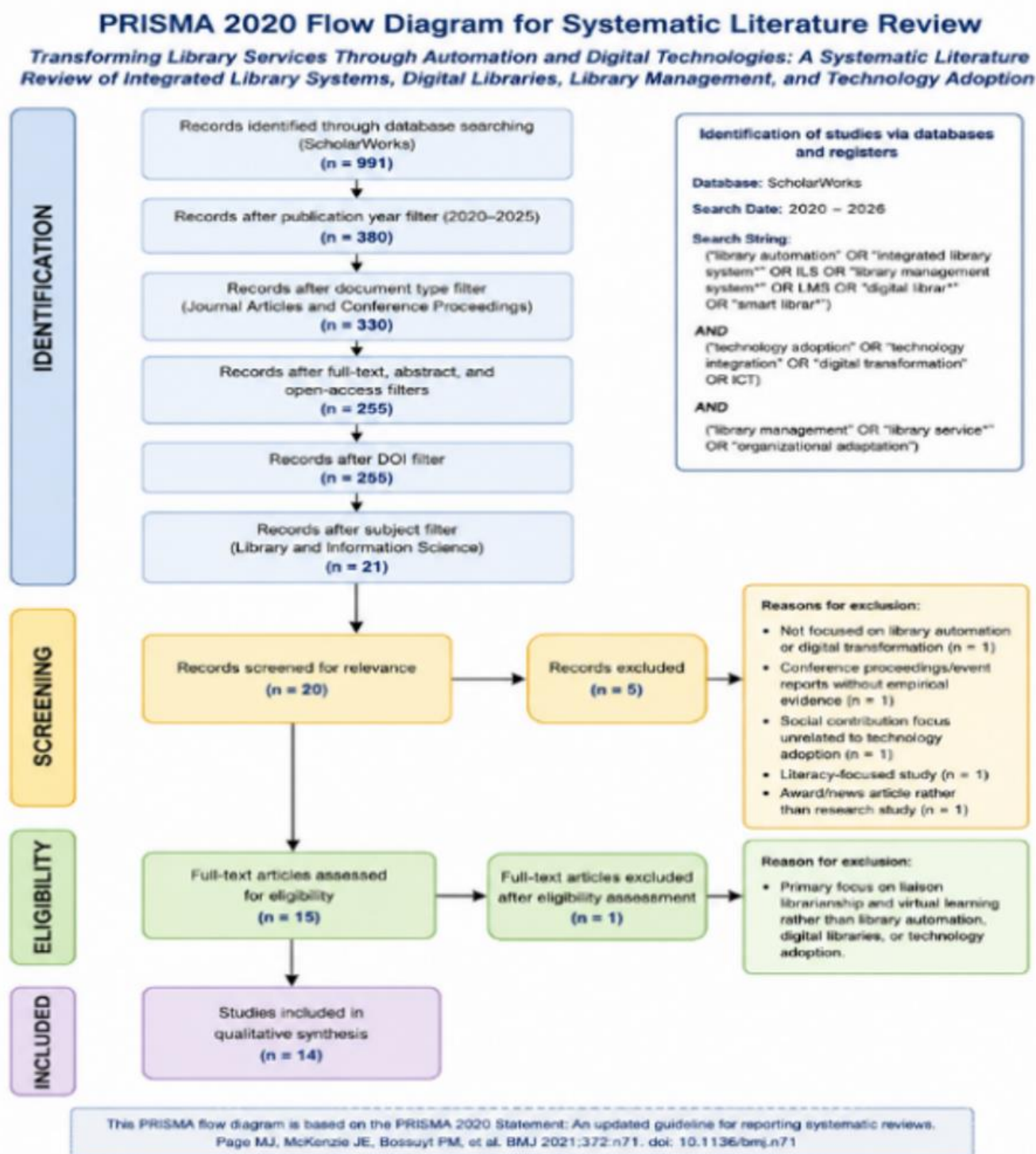


Figure 1 illustrates the PRISMA 2020 screening and selection process used to identify studies included in this systematic literature review. The initial database search yielded 991 records, which were progressively refined through the application of publication year, document type, full-text availability, open-access, DOI, and subject-area filters. These screening steps reduced the pool to 21 potentially relevant studies within the field of Library and Information Science.

The remaining records underwent title and abstract screening, resulting in 20 studies assessed for relevance. During this stage, five studies were excluded because they did not directly address library automation, digital transformation, or technology adoption in library settings, or because they consisted of conference reports, award articles, or publications lacking empirical evidence. Subsequently, 15 full-text articles were evaluated for eligibility, and one study was excluded because its primary focus was liaison librarianship and virtual learning rather than library automation, integrated library systems, digital libraries, or technology adoption.

Following the eligibility assessment and quality appraisal, 14 studies met all inclusion criteria and were included in the final qualitative synthesis. The PRISMA process demonstrates the systematic and transparent approach employed in this review, ensuring that only relevant, high-quality evidence informed the analysis of how automation and digital technologies transform library management and service delivery.

Search Strategy

A systematic search strategy was developed to identify studies related to library automation, integrated library systems, digital libraries, library management, and technology adoption. The search was conducted using the Scholar Works database, which provides access to scholarly and peer-reviewed literature across various disciplines, including Library and Information Science. Scholar Works was selected because it indexes academic publications relevant to digital transformation, information management, and emerging technologies in library environments.

Boolean operators (AND, OR) and truncation symbols (*) were employed to maximize search sensitivity while maintaining relevance to the research question. The following search string was used:

("library automation" OR "integrated library system*" OR ILS OR "library management system*" OR LMS OR "digital librar*" OR "smart librar*") AND ("technology adoption" OR "technology integration" OR "digital transformation" OR ICT) AND ("library management" OR "library service*" OR "organizational adaptation")

The search was limited to studies published between 2020 and 2026 to capture recent developments in library automation, digital transformation, and emerging technologies. Additional filters, including publication year, document type, full-text availability, DOI, and subject classification in Library and Information Science, were applied to improve the relevance and quality of retrieved records. The identified studies were then exported and subjected to screening, eligibility assessment, and quality appraisal in accordance with the PRISMA 2020 guidelines.

Inclusion and Exclusion Criteria

Eligibility criteria were established to ensure consistency and relevance during study selection.

Table 2. Inclusion and Exclusion Criteria

Criterion	Inclusion Criteria	Exclusion Criteria
Topic Relevance	Studies focusing on library automation, ILS, LMS, digital libraries, technology adoption, digital transformation, smart libraries, and technology integration	Studies unrelated to libraries or focusing exclusively on non-library information systems
Population	Libraries, librarians, library staff, and library users	Non-library organizations and unrelated information systems
Intervention	Technology implementation, automation systems, digital library platforms, and integration frameworks	Technical development studies without library management implications
Outcomes	Library management, service delivery, efficiency, accessibility, organizational adaptation, and technology acceptance	Studies lacking library-related outcomes

Study Type	Empirical, qualitative, quantitative, mixed-methods, case studies, reviews, and framework studies	Editorials, opinion papers, news articles, and non-scholarly publications
Publication Period	2020–2026	Studies published before 2020
Language	English	Non-English publications without translation
Accessibility	Full-text studies	Abstract-only or inaccessible studies

Table 2 presents the inclusion and exclusion criteria that guided the screening and selection of papers for this systematic literature review. These criteria were developed based on the research question and the PICOC framework to ensure the review remained focused on current evidence related to library automation, integrated library systems, digital libraries, technology adoption, and digital transformation within library environments.

The inclusion criteria were designed to identify research that directly examined the deployment, adoption, management, evaluation, or impact of technology in libraries. Eligible studies encompassed empirical, qualitative, quantitative, mixed-method, case, and systematic reviews, as well as framework-based studies reporting outcomes in library management, service delivery, operational efficiency, accessibility, organizational adaptation, and technology acceptance. The review targeted libraries, librarians, library workers, and library users, as these populations are primarily affected by technological innovation and changes in library services.

Several exclusion criteria were applied to assess the relevance and quality of the evidence base. Studies unrelated to libraries or focused exclusively on non-library information systems were omitted. Technical development studies describing software or hardware creation without implications for library management or service delivery were also excluded. Editorials, opinion papers, news articles, and other non-scholarly publications were removed due to insufficient methodological rigor and empirical data. To ensure consistency, accessibility, and relevance to contemporary advances in library technology, studies published before 2020, non-English publications without translations, and studies without accessible full texts were excluded.

Collectively, the inclusion and exclusion criteria established a systematic, clear, and rigorous selection procedure. These criteria enabled the identification of works directly aligned with the study objectives, while excluding literature that did not effectively address library automation, digital transformation, organizational adaptability, or technology integration in modern library contexts.

Table 3. PRISMA Screening Summary

PRISMA Stage	Records
Initial database search	991
Year filter (2020–2025)	380
Document type filter	330
Full-text, abstract, and open-access filter	255
DOI filter	255
Subject filter (Library and Information Science)	21
Records screened	20

PRISMA Stage	Records
Records excluded	5
Full-text articles assessed for eligibility	15
Full-text articles excluded	1
Studies included in qualitative synthesis	14

Table 3. PRISMA-based screening and selection process for identifying studies relevant to the research issue. The initial database search identified 991 items for library automation, integrated library systems, digital libraries, technology adoption, digital transformation and library management. Using the publication year filter (2020–2025), we obtained 380 records. Further narrowing the findings to journal articles and conference proceedings reduced the data set to 330 research. Additional filters for full-text availability, abstracts and open access reduced the amount to 255 items while DOI filtering kept the same number. To ensure that the studies are related to the discipline of Library and Information Science, a subject-area filter was used and yielded 21 potentially relevant research. Subsequently, the records were screened by title and abstract according to the stated inclusion and exclusion criteria resulting in 20 articles for full-text review. During the screening process, five research were rejected as they were not directly related to library automation, integrated library systems, digital libraries, technology adoption or technology integration in library environments. Following the full-text eligibility assessment and quality evaluation of the remaining fifteen studies, one study was excluded since it primarily examined virtual learning and liaison librarianship, with a focus on library technology uptake and digital transformation. Hence, fourteen studies met all the inclusion criteria and quality standards and were included in the final qualitative synthesis to build the evidence base to examine how technological advancements affect library management and service delivery in modern library contexts.

Quality Assessment

The quality assessment procedure was carried out according to the standards suggested by Kitchenham and Charters (2007) for evidence-based systematic literature reviews, describing the relevance of the study, the rigor of the methodology, and the contribution to the research objectives. The seven quality assessment criteria (QA1–QA7) covered all the included studies with respect to fit with the research question, research design, clarity of methodology, relevance of findings, discussion of technological implementation and organizational adaptation, challenges, and conclusions. Studies were assessed on a 3-point scale: 2 (complete compliance with a criterion), 1 (partial compliance with a criterion), and 0 (non-compliance with a criterion). The appraisal results showed that all 14 studies exceeded the minimum quality score, which implied that they presented authentic and relevant information on library automation, integrated library systems, digital libraries, technology adoption, and digital transformation. Therefore, all fourteen papers were included in the final qualitative synthesis, ensuring that the conclusions were based on good-quality and methodologically sound research.

Table 4. Quality Assessment Criteria

Code	Quality Assessment Questions
QA1	Was the research objective clearly focused on library automation, integrated library systems, digital libraries, library management, or technology adoption?
QA2	Was the study design appropriate for addressing the research objectives?
QA3	Were the data collection and analysis procedures clearly explained and methodologically sound?
QA4	Did the study provide findings related to library management, service delivery, operational efficiency, user satisfaction, accessibility, or digital transformation?

QA5	Were technological implementations, organizational adaptations, or technology integration frameworks clearly identified and discussed?
QA6	Were challenges, barriers, limitations, or adoption issues adequately identified and analyzed?
QA7	Were the conclusions valid, evidence-based, and relevant to contemporary library environments?

Table 4 presents the quality assessment criteria used to evaluate the methodological rigor and relevance of the studies included in this systematic literature review. The assessment framework consists of seven questions (QA1–QA7) that examine whether each study has clearly defined research objectives, an appropriate study design, sound data collection and analysis procedures, and findings relevant to library management, service delivery, and digital transformation.

In addition, the criteria assess whether the studies adequately discuss technological implementation, organizational adaptation, technology integration frameworks, and the challenges associated with adopting new technologies in library environments. The final criterion evaluates whether the conclusions are evidence-based and applicable to contemporary library settings. Collectively, these quality assessment questions ensure that only methodologically sound and highly relevant studies are included in the final synthesis, thereby enhancing the reliability and credibility of the review findings.

Table 5. Quality Assessment Results

Reviewer	No. of Papers	Studies Above 57% Threshold	Percentage
Reviewer 1	14	14	100%
Reviewer 2	14	14	100%
Reviewer 3	14	14	100%

Table 5 presents the results of the independent quality assessment conducted by three reviewers. The reviewers were professional librarians from State Universities and Colleges (SUCs) with expertise in Library and Information Science, library management, and scholarly research evaluation. Their academic and professional backgrounds enabled them to assess the methodological quality and relevance of the selected studies using the predefined quality assessment criteria.

Three reviewers were intentionally selected to enhance the rigor, reliability, and objectivity of the quality assessment process. Using multiple independent reviewers minimizes individual bias, allows for cross-validation of judgments, and increases confidence in study selection decisions. In cases of differing evaluations, discussions and consensus were used to ensure a fair and transparent assessment of each study.

As shown in Table 5, all three reviewers independently evaluated the 14 included studies and determined that all 14 met or exceeded the minimum quality threshold of 57%, resulting in a 100% acceptance rate. The complete agreement among the reviewers demonstrates a high level of consistency in the quality appraisal process and supports the credibility and robustness of the evidence synthesized in this systematic literature review.

Data Synthesis

Following the quality evaluation and data synthesis process, the 14 studies that met the inclusion criteria and quality level were included. A theme synthesis approach was used to systematically examine and synthesize the findings of the selected research, in line with the principles of Kitchenham and Charters (2007) for evidence-based systematic reviews. Data related to library automation, integrated library systems, digital libraries, technology adoption, organizational adaptation, service transformation, benefits, challenges, and technology integration frameworks were extracted, compared, and categorized to identify recurring patterns and

relationships. The findings were merged into four major themes through an iterative process of coding and thematic grouping. They were Library Automation and Integrated Library Systems, Digital Libraries and ICT-Based Services, Organizational Adaptation and Service Transformation, and Emerging Technologies and Technology Integration Frameworks. These themes provided a systematic framework for analyzing the evidence and understanding how technological advancements transform library management and service delivery in current library environments.

RESULTS

Fourteen high-quality studies were included in this systematic review, identified through a systematic review procedure, on library automation, integrated library systems (ILS), digital libraries, technology uptake, digital transformation, and organizational adaptation in modern libraries. Methodologically, the studies varied and included empirical studies, case studies, systematic reviews, qualitative studies, mixed-method studies, and conceptual analyses. These studies are undertaken in academic, public, special, digital, and research library settings and provide a complete evidence base for understanding the technological revolution in libraries.

Following independent reviewer assessment using predefined quality assessment criteria, all retained papers were deemed to have adequate methodological rigor and to be directly relevant to the study subject. The studies combined presented evidence for technological implementation, service transformation, organizational adaptability, emerging technologies, benefits, obstacles, and technology integration frameworks in contemporary libraries.

Table 6. Final Included Studies After Quality Assessment and Reviewer Consolidation

Study	Methodology	Primary Focus	Alignment	Reviewer Notes	Inclusion Decision
Ahmed Adam & Kiran (2021)	Empirical Study	Institutional repositories and digital library management	Aligned	Strong discussion of digital repositories and organizational adaptation	Included
Ashiq et al. (2022)	Systematic Review	Library transformation during COVID-19	Aligned	Comprehensive evidence of digital transformation	Included
Ayeni et al. (2021)	Systematic Review	Technology-enabled library services	Aligned	Strong service transformation findings	Included
Bwalya & Akakandelwa (2021)	Case Study	Koha implementation and automation	Aligned	Direct automation relevance	Included
Carbery et al. (2020)	Qualitative Study	Digital adaptation in libraries	Aligned	Strong organizational adaptation evidence	Included
Hasan & Naskar (2020)	Conceptual Study	Emerging technologies in libraries	Aligned	Technology trends and innovation focus	Included
Hosseini & Holmes (2023)	Empirical Study	Generative AI adoption in libraries	Aligned	Emerging technology relevance	Included
Ibacache et al. (2021)	Case Study	Remote library instruction and technology tools	Aligned	Strong digital service transformation evidence	Included
Jayakanth et al. (2022)	Case Study	Cloud-based library services	Aligned	Strong ICT transformation focus	Included

Lacey Bryant et al. (2022)	Organizational Analysis	Digital-age library services	Aligned	Strong automation and digital integration evidence	Included
Mahawariya & Yadav (2022)	Empirical Study	ICT implementation in libraries	Aligned	Strong service delivery implications	Included
Omeluzor (2020)	Empirical Study	Integrated Library System adoption	Aligned	Direct ILS relevance	Included
Roy et al. (2022)	Technology Study	Virtual reality implementation	Aligned	Framework contribution	Included
Soni et al. (2020)	Empirical Study	E-resources and digital services	Aligned	Strong digital accessibility evidence	Included

Table 6. Overview of the fourteen-research included in the final qualitative synthesis after quality evaluation and reviewer consolidation processes. The selected studies used different methodologies, including empirical studies, systematic reviews, case studies, qualitative research, conceptual analysis, and organizational studies, providing comprehensive evidence on library automation, integrated library systems, digital libraries, technology adoption, and digital transformation. The studies collectively reveal that technological advancements greatly improve library administration and service delivery by enhancing operational efficiency, information accessibility, resource management, and user engagement. The results also emphasize the importance of organizational flexibility, digital skills, and technological integration in facilitating sustainable library transformation. Also, emerging technologies such as artificial intelligence, cloud computing, and virtual reality were identified as significant drivers of innovation, underscoring the growing importance of new technologies in building modern library systems. Taken as a whole, the research reviewed here provides solid, relevant evidence on how technology adoption contributes to changes in library services and management practices.

How do library automation, integrated library systems, digital libraries, and technology adoption drive the transformation of library management and service delivery through technological implementation, organizational adaptation, and technology integration frameworks in contemporary library environments?

The findings revealed that the use of technology has significantly transformed library management and service delivery by boosting operational efficiency, expanding access to information, facilitating organizational adaptation, and offering novel user services. Libraries that implemented automation systems, digital repositories, cloud computing platforms, artificial intelligence, and virtual learning technologies were more flexible in-service delivery while improving user engagement than traditional service models.

Theme 1: Library Automation and Integrated Library Systems

The findings indicated that library automation and Integrated Library Systems contribute to improved operational efficiency and resource management. Omeluzor (2020) and Bwalya and Akakandelwa (2021) indicated that ILS platforms enhanced accuracy in cataloging, circulation control, acquisitions procedures, and information retrieval. Automated workflows eliminated repetitive manual work and enhanced service consistency.

Libraries that adopted Koha and similar systems reported better access to library collections through Online Public Access Catalogs (OPACs), greater visibility of resources, and more efficient collection management. However, other studies documented issues of technical competence, infrastructural restrictions, and user training.

Table 7. Library Automation and ILS Outcomes

Study	Automation Focus	Key Findings	Outcomes
Omeluzor (2020)	ILS Adoption	Improved resource management	Enhanced service delivery

Bwalya & Akakandelwa (2021)	Koha LMS	Automation efficiency	Improved circulation services
Lacey Bryant et al. (2022)	Digital Systems	Integrated services	Enhanced operational performance

Theme 2: Digital Libraries and ICT-Based Services

Digital libraries have emerged as a major force for change in service. Ahmed Adam and Kiran (2021), Jayakanth et al. (2022), and Soni et al. (2020) indicated that digital repositories, cloud platforms, and electronic resources had significantly increased access to information.

Remote access, data preservation, and scalable service delivery were made possible by cloud computing technology. Institutional repositories expanded the dissemination of knowledge, while digital collections made it accessible regardless of geographical location.

Table 8. Digital Libraries and ICT-Based Services

Study	Digital Focus	Key Findings	Service Impact
Ahmed Adam & Kiran (2021)	Institutional repositories	Increased access and preservation	Enhanced information dissemination
Jayakanth et al. (2022)	Cloud migration	Improved ICT infrastructure	Expanded digital services
Soni et al. (2020)	E-resources	Higher digital usage	Improved user accessibility

Theme 3: Organizational Adaptation and Service Transformation

Adopting the necessary technology required a major organizational change. Ashiq et al. (2022), Ayeni et al. (2021), Carbery et al. (2020), and Ibacache et al. (2021) highlighted how libraries changed from traditional service models to digital and hybrid environments.

The COVID-19 epidemic has driven the development of virtual reference services, online learning support, digital literacy initiatives, and remote access solutions. Librarians found new roles as digital facilitators, technology trainers, and information technology coordinators.

Key success criteria for technology adoption were identified as: organizational flexibility, leadership support, staff development, and digital competencies.

Theme 4: Emerging Technologies and Technology Integration Frameworks

The analysis found an increasing use of emerging technologies, including artificial intelligence, virtual reality, cloud computing, and smart library technology.

Hosseini and Holmes (2023) showed how generative artificial intelligence is changing library procedures and information services. Roy et al. (2022) mentioned that virtual reality technology enables immersive learning settings and expands educational options. Hasan and Naskar (2020) have pointed out technology trends such as smart libraries, artificial intelligence, and digital innovation.

These technologies led to the introduction of technology integration frameworks that integrate technological infrastructure, organizational preparedness, personnel competencies, and user-centered service design.

DISCUSSION

The findings of the systematic literature review in relation to the research question and highlights the key factors driving the transformation of contemporary library services. Based on the synthesis of the 14 included studies, five major areas emerged: technological implementation, organizational adaptation, benefits, challenges, and technology integration frameworks. Together, these themes demonstrate how digital technologies are reshaping library management and service delivery while emphasizing the importance of organizational readiness and continuous innovation for sustainable transformation.

Technological Implementation

The findings show that technology is a key factor in how libraries are changing. Tools like integrated library systems, cloud computing, digital repositories, virtual learning environments, and artificial intelligence help libraries work more efficiently, improve access, and offer new services. By adopting these technologies, libraries can manage resources better and meet users' changing needs in a digital world.

Organizational Adaptation

The review shows that adopting technology is not just about installing new systems. Libraries also need to adapt as organizations, with strong leadership, clear policies, staff training, and updated workflows. Librarians now take on more technology-focused roles, which require advanced digital skills and ongoing learning.

Benefits

The studies reviewed found several clear benefits. These include greater efficiency, easier access to information, higher user satisfaction, expanded remote services, better resource management, and greater organizational flexibility. Using technology also helps libraries navigate larger digital changes and become more resilient.

Challenges

Despite these benefits, libraries still face major challenges. Problems include limited infrastructure, tight budgets, not enough technical skills, resistance to change, cybersecurity risks, and the digital divide. Smaller libraries often struggle more because they have less money and technical help.

Frameworks for Technology Integration

The findings suggest that successful technology integration depends on the interaction of four core dimensions:

1. Technological Infrastructure
2. Organizational Readiness
3. Staff Competencies
4. User-Centered Service Design

These dimensions collectively form a technology integration framework that supports sustainable digital transformation in libraries.

Limitations

This review has some limitations. It only examined English-language research from 2020 to 2026, so it may have missed important studies from earlier years or in other languages. Only peer-reviewed journal articles and conference papers were included, while gray literature and practitioner reports were left out. Even though the review used PRISMA 2020 methods and an independent quality check, the qualitative analysis could still be biased. Also, new advances in artificial intelligence, cloud computing, and smart library technology may offer more information beyond the review's time frame.

CONCLUSION

This review examines library automation, integrated library systems, digital libraries, and how libraries are adopting new technologies. The findings show that using technology has a big impact on how libraries are managed and the services they offer. It leads to better efficiency, easier access to information, more digital services, and changes in how libraries are organized.

Integrated Library Systems and automation tools help libraries manage resources and work more efficiently. Digital libraries and cloud services make it easier to access information. For technology to work well, libraries also need to adapt as organizations, with strong leadership, staff training, and readiness for change. New tools like artificial intelligence, virtual reality, and smart library systems also help create new services and drive digital change.

As a whole, the review shows that combining effective technology, organizational change, skilled staff, and user-focused services is key to lasting change in libraries. Future research should look at how artificial intelligence, smart library systems, digital resilience, and long-term technology plans can help libraries adapt.

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