Fee-based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence: A systematic literature review

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Abstract
This study systematically reviewed the literature on fee based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence (AI). The review examined the fee based services currently provided by university libraries, their contribution to service delivery, and AI enabled fee based services that can strengthen library sustainability and innovation. A Systematic Literature Review guided by the PRISMA 2020 framework was adopted. Relevant studies published between 2018 and 2026 were retrieved from Scopus, Web of Science, ERIC, Library and Information Science Source, ScienceDirect, and Google Scholar. Following the screening and eligibility process, 35 empirical studies met the inclusion criteria and were synthesized using a narrative thematic approach. The findings revealed that Nigerian university libraries predominantly provide conventional fee based services such as photocopying, binding, printing, internet access, and consultancy services. These services contribute to improved service quality, operational efficiency, financial sustainability, and user satisfaction. The review further identified AI enabled opportunities including automated literature searching, systematic review support, research data management, AI assisted bibliometric analysis, metadata generation, digital content creation, virtual reference services, AI literacy training, and scholarly communication support. However, inadequate funding, weak digital infrastructure, limited AI competencies, and the absence of institutional AI governance frameworks continue to constrain implementation. The study concludes that integrating AI into fee based library services can diversify revenue sources, enhance research support, and improve service delivery. It recommends increased investment in digital infrastructure, continuous professional development, curriculum reform, and institutional AI governance to promote sustainable and innovative library services in Nigerian university libraries.

Keywords: Artificial intelligence, fee based library services, academic libraries, university libraries, service delivery, digital scholarship, Nigeria, systematic literature review.

Introduction
The rapid advancement of artificial intelligence (AI) is transforming higher education and reshaping the operations of academic libraries worldwide. AI technologies such as machine learning, natural language processing, generative AI, intelligent automation, and predictive analytics are increasingly being integrated into library services to enhance information organization, digital content creation, user engagement, and research support (Alajmi & Alhajri, 2021; Ahmed & Ali, 2020; Liu et al., 2020). These technologies have improved the efficiency, accuracy, and responsiveness of library operations while enabling librarians to deliver innovative services that meet the evolving information needs of users. As universities

continue to embrace digital transformation, academic libraries are expected to provide high quality, technology driven services despite persistent financial and operational constraints.

In developed countries, academic libraries have increasingly diversified their revenue streams in response to rising operational costs and growing demand for specialized information services. Universities in the United States, the United Kingdom, Canada, and Australia offer value added fee based services such as research data management, bibliometric analysis, systematic review support, digitization, scholarly publishing assistance, digital preservation, and information consultancy (Olaseigbe et al., 2025; Tan, 2021; Marshall & Bly, 2019). These services have enabled libraries to supplement institutional funding, improve service quality, and strengthen their contribution to teaching, learning, and research while maintaining equitable access to core library resources. The experiences of these countries demonstrate that well managed fee based services can enhance the financial sustainability and long term relevance of academic libraries.

University libraries play a central role in supporting teaching, learning, research, and community service by acquiring, organizing, preserving, and disseminating information resources. However, many university libraries, particularly in developing countries such as Nigeria, continue to face challenges including inadequate funding, rising costs of information resources, obsolete infrastructure, insufficient technological facilities, and increasing user expectations (Ukaegbu & Okwu, 2023; Ukaegbu & Wegwu, 2019; Saka et al., 2014). These challenges have been exacerbated by the growing demand for digital resources, electronic databases, institutional repositories, research support services, and AI enabled library applications. Consequently, traditional funding mechanisms are often insufficient to sustain the quality and expansion of library services, prompting many university libraries to explore alternative sources of revenue (Olaseigbe et al., 2025).

Fee based library services have emerged as one of the strategies adopted by university libraries to supplement limited institutional funding and improve service delivery (Ejezie & Okeke, 2021). Such services involve charging users for specialized library products and services that extend beyond the institution's core statutory responsibilities. Common examples include document delivery, interlibrary loan, printing and photocopying, internet access, binding and lamination, plagiarism detection, digitization services, research consultancy, bibliometric analysis, institutional repository support, training workshops, and information literacy programmes. Revenue generated from these services can be reinvested in improving library infrastructure, expanding digital collections, acquiring emerging technologies, and enhancing staff capacity (Olaseigbe et al., 2025). When carefully implemented, fee based services provide libraries with additional financial resources without undermining their primary mission of equitable access to information.

The emergence of AI has further expanded the scope and value of fee based library services. AI powered tools now enable librarians to offer advanced services such as automated literature searching, systematic review support, research data management, AI assisted bibliometric analysis, metadata generation, digital content creation, virtual reference services, research impact assessment, and AI literacy training (Abu & Musa, 2025; Ogungbenro et al., 2025; Yusuf et al., 2022). Generative AI applications also support the development of research guides, instructional materials, digital learning resources, and scholarly communication services that can be delivered as premium value added offerings. These technologies improve service efficiency, reduce routine workloads, enhance research productivity, and create new opportunities for libraries to generate revenue through

innovative digital services. Consequently, AI is repositioning university libraries from traditional information providers to technology enabled knowledge and innovation hubs capable of delivering high quality, user centred, and financially sustainable services while strengthening institutional teaching, learning, research, and scholarly communication (Obi, 2026; Ogungbenro et al., 2025; Stephen & Chatterjee, 2025).

In contrast to the progress recorded in developed countries, the adoption of fee based AI enabled services in Nigerian university libraries remains relatively limited. Existing studies identify persistent barriers including inadequate funding, poor technological infrastructure, unstable internet connectivity, insufficient AI competencies among librarians, weak institutional policies, and limited investment in digital innovation (Igbo et al., 2025; Lakan, 2025). These constraints reduce libraries' capacity to introduce sustainable revenue generating services and fully exploit AI technologies for enhanced service delivery. Although many Nigerian university libraries provide traditional fee based services such as photocopying, printing, internet access, and binding, more advanced AI enabled services remain largely underdeveloped.

Despite growing scholarly interest in fee based library services, library sustainability, and AI adoption, the literature remains fragmented. Existing studies have largely examined these issues independently, with limited synthesized evidence on how fee based library services can enhance service delivery within the context of AI driven transformation in Nigerian university libraries (Igbo et al., 2025; Olaseigbe et al., 2025). Furthermore, little attention has been given to lessons that can be drawn from developed countries where AI supported value added library services have become increasingly institutionalized. This systematic literature review therefore synthesizes existing empirical evidence on fee based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence. Specifically, the review examines the range of fee based services offered by university libraries, lessons from developed countries, the contribution of these services to library performance and sustainability, the influence of AI technologies on fee based service delivery, the challenges affecting implementation, and the strategies required to strengthen sustainable, innovative, and user centered library services. The review provides evidence based insights to guide library managers, university administrators, policymakers, and professional associations in developing financially sustainable and AI enabled library services that can effectively support teaching, learning, research, and innovation in Nigerian universities.

Statement of the Problem

The rapid advancement of AI is reshaping academic libraries by expanding opportunities for innovative service delivery, digital scholarship, and value added information services. AI technologies have enhanced research support, metadata generation, digital content creation, virtual reference services, and data management, enabling libraries to deliver more specialized and user centred services. In developed countries, these advances have been accompanied by the expansion of fee based library services, allowing university libraries to diversify revenue sources, improve financial sustainability, and strengthen teaching, learning, and research. However, the situation in many developing countries, including Nigeria, remains markedly different. Nigerian university libraries continue to face persistent challenges, including inadequate funding, obsolete infrastructure, insufficient technological facilities, unreliable internet connectivity, and limited investment in AI technologies. These constraints have hindered the introduction of innovative fee based services and the effective integration of AI into library operations, making it difficult to meet users' evolving

information needs while sustaining high quality service delivery. Although numerous studies have examined fee based library services, library sustainability, and AI adoption independently, the existing literature remains fragmented and provides limited synthesized evidence on how fee based library services can enhance service delivery in Nigerian university libraries within the context of AI driven transformation. This gap underscores the need for a systematic literature review to examine fee based services, AI enabled service innovation, implementation challenges, and strategies for strengthening financially sustainable and user centered academic library services in Nigeria.

Research Questions

The following research questions were answered in this study:

- What fee based library services are provided in university libraries?
- How do fee based library services contribute to enhanced service delivery in university libraries?
- What AI enabled fee based library services can university libraries in Nigeria provide?

Literature review

Fee-based library services provided in university libraries

Empirical evidence from Nigeria indicates that the provision of fee based library services remains largely concentrated on traditional services, with relatively limited adoption of technology driven and AI enabled offerings. Idubor and Stella (2025), drawing on the Resource Based View (RBV) theory, found that Nigerian university libraries provide fee based services such as binding, photocopying, and user registration, whereas more specialized services, including data analysis and laptop lending, are rarely offered. The study concluded that although fee based services contribute to improved service delivery, their scope remains limited because of inadequate technological resources and institutional capacity. Similarly, Odusanya et al. (2024) reported that private university libraries in Ede, Osun State, offered fee based services including computer typesetting, consultancy services, online searching, internet browsing, and overdue fines, demonstrating a gradual expansion from conventional to technology supported services. Likewise, Tsenongu and Otuza (2024) found that private university libraries in Akwa Ibom State primarily relied on traditional revenue generating services such as photocopying, membership registration, library card replacement, overdue fines, lamination, and binding, with little evidence of advanced digital or AI enabled services. Furthermore, Nuhu and Aliyu (2022) investigated fee based electronic information services in Nigerian federal university libraries and revealed that only the University of Lagos had partially implemented electronic fee based services, specifically internet access and laptop lending. Collectively, these studies suggest that while fee based services have become an important strategy for supplementing library funding, their implementation remains largely conventional, highlighting substantial opportunities for Nigerian university libraries to diversify their service portfolios through AI enabled, value added services that can enhance service delivery, research support, and financial sustainability.

Contribution of fee-based library services to enhanced service delivery

Empirical evidence consistently demonstrates that fee based library services contribute significantly to enhanced service delivery in university libraries by improving service quality, operational efficiency, financial sustainability, and user satisfaction. Idubor and Stella (2025) found that fee based services positively influence both the quality and

efficiency of library service delivery, with the availability of a wider range of fee based services significantly enhancing users' perceptions of service quality in Nigerian university libraries. Similarly, Odusanya et al. (2024) reported that fee based library services have a meaningful positive impact on service delivery in private university libraries by expanding access to specialized information services. Likewise, Tsenongu and Otuza (2024) observed that fee based services increase internally generated revenue, improve service standards, and promote innovation in library operations. Supporting these findings, Nuhu and Aliyu (2022) revealed that the implementation of fee based electronic information services at the University of Lagos generated additional income and increased users' patronage of library services. Collectively, these studies indicate that fee based library services provide an important mechanism for strengthening service delivery, improving resource availability, and enhancing the long term sustainability of university libraries.

AI enabled fee based library services that university libraries can provide

Empirical evidence indicates that AI is creating new opportunities for university libraries to expand fee based service delivery through innovative, technology driven offerings. Across the reviewed studies, AI technologies have been increasingly integrated into reference services, research support, instructional services, workflow automation, metadata management, and scholarly communication, resulting in improved efficiency, faster service delivery, enhanced personalization, and increased research productivity (Sheikh, 2026; Egbe, 2026; Kim, 2025). Luo (2025) reported that academic librarians increasingly utilize generative AI for literature searching, brainstorming, drafting instructional materials, and supporting reference services, while Kim (2025) observed that AI powered chatbots and intelligent virtual assistants have transformed academic libraries into proactive research and knowledge support centres. The reviewed literature further demonstrates that these technological advancements provide opportunities for university libraries to introduce premium AI enabled services. These include automated literature searching and advanced search strategy support (Boateng, 2024), systematic review assistance through AI supported screening and evidence mapping (King's College London Libraries & Collections, 2025), research data management (Mwantimwa & Msoffe, 2025), AI assisted bibliometric analysis and research impact assessment (Hussain & Ahmad, 2024), metadata generation for institutional repositories, digital content creation, virtual reference services and AI chatbots (Tella, 2023), AI literacy training (Lo, 2024), and scholarly communication support, including manuscript preparation and research dissemination (Raghavendra et al., 2025). Collectively, these studies suggest that AI enabled fee based services can diversify library revenue, strengthen institutional research support, improve operational efficiency, and enhance user satisfaction. Nevertheless, successful implementation depends on skilled librarians, robust digital infrastructure, and appropriate ethical oversight to ensure responsible, accurate, and trustworthy AI supported service delivery.

Methodology

Research Design

This study adopted a Systematic Literature Review (SLR) design to synthesize existing evidence on fee-based library services and their contribution to enhanced service delivery in Nigerian university libraries within the context of AI. A systematic literature review was considered appropriate because it enables the identification, selection, critical appraisal, and synthesis of relevant evidence in a transparent, rigorous, and reproducible manner while minimizing selection bias. The review also facilitates the identification of emerging trends,

research gaps, and future directions regarding the integration of AI into fee-based library services.

Review Protocol

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. The PRISMA framework guided the identification, screening, eligibility assessment, and inclusion of studies to ensure methodological transparency, consistency, and reproducibility throughout the review process.

Data Sources

A comprehensive literature search was conducted between 10 June and 25 June 2026, with the final search completed on 25 June 2026. Six major scholarly databases were searched because of their broad coverage of library and information science, higher education, management, and technology-related literature.

The databases searched were:

- Scopus
- Web of Science
- Library and Information Science Source (EBSCOhost)
- ERIC
- ScienceDirect
- Google Scholar

These databases were selected because they index high-quality peer-reviewed literature relevant to university libraries, AI, library management, and service innovation.

Search Strategy

The search strategy employed Boolean operators (**AND**, **OR**) and truncation where appropriate. The principal search terms included:

- "Fee-based library services"
- "Revenue generation"
- "Income generating services"
- "Cost recovery"
- "Academic libraries"
- "University libraries"
- "Artificial Intelligence"
- "AI"
- "Library services"
- "Service delivery"
- "Nigeria"

An example of the search string was:

("Fee-based library services" OR "Income generating services" OR "Cost recovery") AND ("University libraries" OR "Academic libraries") AND ("Artificial Intelligence" OR AI) AND ("Service delivery") AND Nigeria

The search was limited to studies published between 2018 and June 2026. Retrieved records were exported into Microsoft Excel for organization, duplicate identification, and screening.

Eligibility Criteria

Studies were selected using predefined inclusion and exclusion criteria.

Inclusion Criteria

Studies were included if they:

- were published in peer-reviewed journals or scholarly books/book chapters;
- were published between 2018 and 2026;

- were written in English;
- focused on university or academic libraries;
- examined fee-based library services, cost recovery, revenue generation, or paid information services;
- discussed AI or digital technologies where relevant to library service delivery; and
- reported empirical findings or systematic, scoping, or narrative reviews relevant to the study objectives.

Exclusion Criteria

Studies were excluded if they:

- were conference abstracts, editorials, opinion papers, commentaries, or book reviews;
- were duplicate records;
- were published in languages other than English;
- focused on non-library settings;
- did not address fee-based library services or enhanced library service delivery; or
- lacked sufficient methodological information.

Study Selection and Screening

The study selection process followed the four stages recommended by the PRISMA 2020 framework.

Identification

Relevant studies were retrieved from the selected databases using the predefined search strategy.

Screening

Duplicate records were removed, after which titles and abstracts were screened against the inclusion and exclusion criteria.

Eligibility

The full texts of potentially eligible articles were retrieved and assessed independently using the predefined eligibility criteria.

Inclusion

Studies meeting all eligibility requirements were included in the final synthesis.

A PRISMA 2020 flow diagram was used to document the number of records identified, screened, excluded, and included at each stage.

Data Extraction

Data extracted from each eligible study included the authors, publication year, country of study, study objectives, research design, study setting, types of fee-based library services investigated, reported contributions of fee-based services to library service delivery, AI-enabled fee-based library services identified, implementation challenges, and the key findings relevant to the research questions. The extracted information was organized in Microsoft Excel and subsequently synthesized using thematic analysis.

Table 1: Characteristics of the Included Studies

S/N	Author(s)	Year	Study Type	Main Theme
1	Ahmed & Ali	2020	Empirical	AI opportunities and challenges in libraries
2	Alajmi & Alhajri	2021	Systematic Review	AI applications for accessibility
3	Boateng	2025	Empirical	Generative AI access services
4	Egbe	2026	Empirical	AI and reference services
5	Hussain & Ahmad	2024	Bibliometric Study	AI research trends in academic libraries
6	Igbo et al.	2025	Empirical	AI adoption requirements and challenges
7	Kim	2025	Empirical	Generative AI in academic libraries
8	Liu, Zhang & Li	2020	Empirical	AI-powered virtual reference services
9	Lo	2025	Review	Generative AI and scholarly publishing
10	Luo	2025	Survey	Librarians' use of generative AI
11	Marshall & Bly	2019	Conceptual	Intelligent information spaces
12	Mwantimwa & Msoffe	2025	Scoping Review	Generative AI in library operations
13	Obi	2026	Systematic Review	AI-enhanced library services
14	Ogungbenro et al.	2025	Empirical	AI in cataloguing and information access
15	Raghavendra et al.	2025	Systematic Review	Generative AI in LIS
16	Sheikh	2026	Systematic Review	AI reference services and librarian roles
17	Stephen & Chatterjee	2025	Review	Smart libraries
18	Tan	2021	Case Study	Library chatbots
19	Tella	2023	Systematic Review	AI for reference services
20	Yusuf et al.	2022	Empirical	AI adoption in Nigerian academic libraries
21	Abu & Musa	2025	Literature Review	AI for enhanced service delivery
22	Lakan	2025	Empirical	AI adoption, challenges and prospects
23	King's College London Libraries	2025	Professional Guideline	AI tools in evidence synthesis
24	Idubor & Stella	2025	Empirical	Fee-based library services
25	Ejezie & Okeke	2021	Empirical	Fee-based services
26	Nuhu & Aliyu	2022	Empirical	Electronic fee-based services
27	Odusanya et al.	2024	Empirical	Fee-based service delivery
28	Olaseigbe et al.	2025	Empirical	Sustainable fee-based initiatives
29	Tsenongu & Otuza	2024	Empirical	Fee-based services implementation
30	Ukaegbu & Okwu	2023	Empirical	Library collaboration
31	Ukaegbu & Wegwu	2019	Empirical	ICT resources in libraries

Quality Assessment

The methodological quality of the included studies was assessed using the appropriate Joanna Briggs Institute (JBI) Critical Appraisal Checklist according to each study's research design. The appraisal considered the suitability of the research design, sampling procedures, data collection methods, analytical techniques, validity and reliability of findings, and overall methodological rigor. Based on the appraisal outcomes, studies rated as low methodological quality were excluded from the final synthesis, while studies rated as moderate or high quality were retained. Only studies that met the predefined methodological quality threshold were retained for the final synthesis. Consequently, 31 studies satisfied both the eligibility criteria and quality assessment requirements and were included in the qualitative synthesis.

Data Synthesis

Findings were synthesized using narrative thematic synthesis because the included studies employed diverse research designs, settings, and outcome measures, making statistical meta-analysis inappropriate. The thematic synthesis focused on:

- Fee-based library services provided in university libraries;
- The contribution of fee-based library services to enhanced service delivery in university libraries; and
- AI-enabled fee-based library services that can be implemented in Nigerian university libraries.

The synthesis enabled comparison of findings across different institutional and geographical contexts, facilitating the identification of recurring themes, emerging trends, similarities, differences, and gaps in the existing literature.

Limitations of the Review

This review was limited to English-language studies published between 2018 and 2026 and indexed in the selected databases. Grey literature, dissertations, conference proceedings, unpublished reports, and other non-peer-reviewed publications were excluded. Consequently, some relevant studies may not have been captured. Nevertheless, the selected databases provided comprehensive coverage of high-quality literature relating to fee-based library services, artificial intelligence, and service delivery in university libraries.

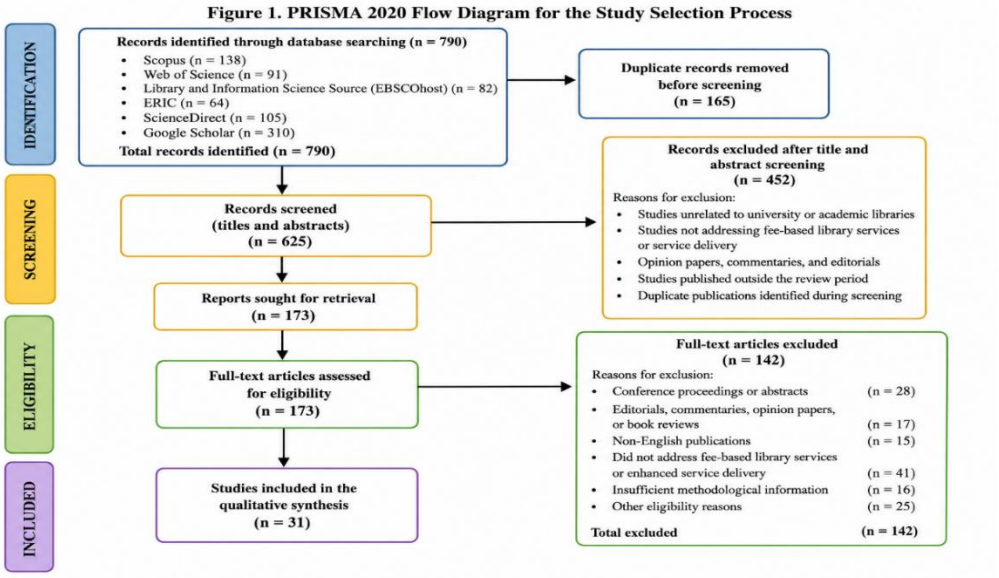


Figure 1. PRISMA 2020 flow diagram illustrating the study selection process.

Figure 1 presents the PRISMA 2020 study selection process employed in this review. A total of 790 records were identified through searches of six electronic databases. Following the removal of 165 duplicate records, 625 records remained for title and abstract screening. During the screening stage, 452 records were excluded because they did not meet the inclusion criteria. Subsequently, 173 full-text articles were assessed for eligibility. Of these, 142 articles were excluded for reasons including publication type, language, insufficient methodological information, and lack of relevance to the review objectives. Consequently, 31 studies met all eligibility and quality assessment criteria and were included in the final qualitative synthesis.

PRISMA Flow Summary

Identification

- Records identified through database searching (n = 790)
    - Scopus (n = 138)
    - Web of Science (n = 91)
    - Library and Information Science Source (EBSCOhost) (n = 82)
    - ERIC (n = 64)
    - ScienceDirect (n = 105)
    - Google Scholar (n = 310)
    - Duplicate records removed before screening (n = 165)

Screening

- Records screened (titles and abstracts) (n = 625)
- Records excluded (n = 452)

Eligibility

- Full-text articles assessed for eligibility (n = 173)
- Full-text articles excluded (n = 142)
    - Conference proceedings or abstracts (n = 28)
    - Editorials, commentaries, opinion papers, or book reviews (n = 17)
    - Non-English publications (n = 15)
    - Studies not addressing fee-based library services or enhanced service delivery (n = 41)
    - Insufficient methodological information (n = 16)
    - Other reasons not meeting the eligibility criteria (n = 25)

Included

- Studies included in the qualitative synthesis (n = 31)

Results

Fee-based library services provided in university libraries

The reviewed studies indicate that university libraries predominantly provide conventional fee based services, with relatively limited adoption of technology driven and AI enabled services. Commonly reported services include photocopying, binding, printing, internet access, online searching, consultancy services, user registration, overdue fines, library card replacement, lamination, and laptop lending. Although some private and federal university libraries have expanded into electronic information services such as online searching and internet access, advanced digital services remain uncommon. Overall, the findings suggest that fee based services in Nigerian university libraries are still largely traditional and have not fully evolved to meet the growing demand for technology enabled and research oriented library services.

Contribution of fee-based library services to enhanced service delivery

The reviewed literature consistently demonstrates that fee based library services contribute positively to university library service delivery. The studies indicate that these services improve operational efficiency, generate additional revenue, enhance the quality of library services, increase users' patronage, and promote service innovation. Revenue generated from fee based services enables libraries to support infrastructure development, maintain existing services, and improve access to specialized information resources. Overall, the evidence suggests that fee based services represent an important strategy for strengthening the financial sustainability and effectiveness of university libraries.

AI-enabled fee based library services that university libraries can provide

The review shows that artificial intelligence has significantly expanded opportunities for university libraries to introduce innovative fee based services. The most frequently identified AI enabled services include automated literature searching, systematic review support, research data management, AI assisted bibliometric analysis, research impact assessment, metadata generation, digital content creation, virtual reference services, AI powered chatbots, AI literacy training, and scholarly communication support. These services have been reported to improve service efficiency, reduce routine workloads, enhance research productivity, and provide personalized user support. The findings further indicate that AI enabled services have considerable potential to diversify library revenue while strengthening teaching, learning, research, and institutional visibility. However, their successful implementation depends on adequate digital infrastructure, skilled librarians, institutional support, and appropriate ethical and governance frameworks.

Discussion

Fee-based library services provided in university libraries

The findings indicate that fee based library services in Nigerian university libraries remain largely concentrated on conventional services such as photocopying, binding, printing, internet access, and consultancy, with relatively limited integration of technology driven and AI enabled services. This suggests that although university libraries recognize the importance of internally generated revenue, they have yet to fully exploit emerging digital technologies to diversify their service portfolios. The predominance of traditional services may reflect persistent challenges such as inadequate funding, poor technological infrastructure, insufficient digital competencies, and weak institutional support for innovation. These findings are consistent with Idubor and Stella (2025), who found that Nigerian university libraries primarily provide conventional fee based services, with limited provision of specialized services such as data analysis and laptop lending. Similarly, Tsenongu and Otuza (2024) observed that most private university libraries continue to rely on traditional revenue generating services including photocopying, binding, and library registration. The findings therefore suggest that Nigerian university libraries need to transition from conventional fee based services to technology enabled and knowledge intensive services that better support contemporary teaching, learning, and research.

Contribution of fee-based library services to enhanced service delivery

The findings demonstrate that fee based library services contribute significantly to improved service delivery by generating additional revenue, enhancing operational efficiency, improving service quality, and increasing user patronage. This implies that fee based services have become an important mechanism for addressing persistent financial constraints confronting university libraries. Revenue generated through these services enables libraries to maintain infrastructure, expand collections, improve access to digital resources, and

introduce innovative services that may not be adequately supported through institutional funding alone. These findings corroborate those of Idubor and Stella (2025), who reported that fee based services positively influence both the quality and efficiency of library service delivery. Likewise, Odusanya et al. (2024) found that fee based services significantly enhance service delivery by expanding access to specialized information services. The findings therefore reinforce the view that well managed fee based services can strengthen the financial sustainability and long term effectiveness of university libraries without compromising their core educational mission.

AI-enabled fee based library services that university libraries can provide

The findings reveal that artificial intelligence presents significant opportunities for university libraries to diversify their fee based services through innovative, technology driven offerings that extend beyond traditional library operations. Services such as automated literature searching, systematic review support, AI assisted bibliometric analysis, research data management, digital content creation, virtual reference services, AI literacy training, and scholarly communication support reflect the evolving role of academic libraries in supporting research and digital scholarship. These findings suggest that AI is not only improving operational efficiency but also creating new revenue generating opportunities through specialized, high value information services. The findings align with Luo (2025), who reported that generative AI enhances literature searching, instructional content development, and research support within academic libraries. Similarly, Kim (2025) found that AI powered chatbots and intelligent virtual assistants are transforming libraries into proactive knowledge and research support centres. The findings therefore indicate that successful implementation of AI enabled fee based services will require sustained investment in digital infrastructure, continuous professional development, institutional commitment, and ethical governance to ensure that AI technologies are deployed responsibly while maximizing their benefits for teaching, learning, research, and institutional sustainability.

Practical implications for academic libraries

The findings of this review have important implications for university administrators, library managers, policymakers, and professional associations. Although fee based library services have enhanced service delivery, their implementation in Nigerian university libraries remains largely conventional. Libraries should diversify their services by introducing AI enabled offerings such as automated literature searching, systematic review support, AI assisted bibliometric analysis, research data management, virtual reference services, and AI literacy training to improve research support, user satisfaction, and revenue generation. Achieving this requires sustained investment in digital infrastructure, AI technologies, reliable internet connectivity, continuous professional development, curriculum reform in Library and Information Science education, and the establishment of institutional AI governance frameworks and ethical guidelines to support responsible AI adoption.

Research gaps and future research directions

Although this review provides a comprehensive synthesis of the existing literature, several important research gaps remain. First, empirical evidence on AI enabled fee based library services is still limited, particularly within African countries and Nigerian university libraries. Most existing studies focus on traditional fee based services or general AI adoption, with relatively few examining the integration of AI into revenue generating library services. Second, the majority of reviewed studies employed descriptive and cross sectional research

designs, providing limited evidence on the long term impact of AI enabled fee based services on library sustainability, research productivity, user satisfaction, and institutional performance. Future studies should therefore adopt longitudinal, mixed methods, and comparative research designs to evaluate the effectiveness and sustainability of AI enabled library services across different institutional contexts. Future research should also investigate users' willingness to pay for AI enabled library services, librarians' readiness and competencies for AI driven service delivery, the cost effectiveness of AI based services, and the development of governance frameworks that address ethical, legal, and privacy concerns associated with AI implementation. Comparative studies between developed and developing countries would further provide valuable insights into best practices for strengthening AI enabled fee based library services in Nigerian university libraries.

Conclusion and Recommendations

This systematic literature review synthesized empirical evidence on fee based library services as a catalyst for enhanced service delivery in Nigerian university libraries in the era of artificial intelligence. The review found that university libraries continue to rely predominantly on traditional fee based services, which contribute to improved service quality, operational efficiency, financial sustainability, and user satisfaction. It also revealed that artificial intelligence offers significant opportunities to diversify library services through innovative offerings such as automated literature searching, systematic review support, AI assisted bibliometric analysis, research data management, digital content creation, virtual reference services, and AI literacy training. These services have the potential to strengthen research support, enhance institutional visibility, improve user satisfaction, and generate sustainable revenue. Despite these opportunities, the adoption of AI enabled fee based services remains constrained by inadequate funding, weak digital infrastructure, limited AI competencies among librarians, and the absence of comprehensive institutional policies and governance frameworks. To maximize the benefits of AI, university libraries should diversify their service portfolios by adopting innovative AI enabled services, while universities and government agencies should invest in digital infrastructure, AI technologies, and continuous staff development. Furthermore, Library and Information Science curricula should incorporate AI related competencies, and institutions should establish appropriate AI governance and ethical frameworks. These measures will strengthen the sustainability, innovation, and relevance of Nigerian university libraries in supporting teaching, learning, research, and scholarly communication.

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