



Evolving Trends in Library Reference Services: Technology, Engagement & Inclusion: A study

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Abstract--Library reference services are undergoing rapid evolution driven by technological innovation, changing user expectations, and dynamic institutional roles. This article explores emerging trends such as the integration of artificial intelligence, expansion of digital and roving reference models, the development of learning commons, adoption of evidence-based practices, and enhanced accessibility initiatives. Additionally, it considers the growing importance of sustainability and social engagement in library services. These developments are reshaping the professional responsibilities of librarians and redefining how users interact with information in both academic and public library settings. The paper underscores the need for ethical, inclusive, and user-centered strategies to ensure reference services remain relevant, effective, and equitable in 2025 and beyond.

Keywords-- Reference Services, Library Innovation, Artificial Intelligence, Learning Commons, Digital Literacy

I. INTRODUCTION

Reference services remain the cornerstone of library patron engagement, serving as the primary channel through which users seek assistance in navigating and utilizing library resources. Traditionally delivered through face-to-face interactions at reference desks, these services have evolved significantly in response to technological advancements, changing user behavior, and institutional shifts in service delivery models. Nowadays library users are more digitally literate and expect seamless, on-demand support that extends beyond physical library spaces. The proliferation of digital resources, the rise of remote learning and working, and the growing need for personalized assistance have all contributed to the transformation of reference services. Libraries now operate in a complex environment where they must balance traditional roles with innovative approaches to remain relevant and effective. Moreover, the role of librarians has expanded from being information gatekeepers to educators, collaborators, and technology facilitators. In this evolving landscape, reference services are no longer confined to answering questions but also involve guiding users through information literacy, research strategies, and the ethical use of information. This shift necessitates continual professional development and the adoption of user-centered design in service delivery.

This paper explores the major trends currently shaping library reference services, including the integration of artificial intelligence, the shift toward hybrid service models, the redesign of physical spaces into learning commons, the emphasis on evidence-based practice, inclusive service design, and the alignment of library practices with sustainability goals. By understanding these trends, libraries can better anticipate user needs, optimize service delivery, and reaffirm their role as vital community and academic partners.

II. OBJECTIVES OF THE STUDY

1. To examine the impact of emerging technologies, particularly artificial intelligence, on the delivery of reference services in libraries.
2. To explore the shift toward hybrid and digital reference service models and their effectiveness in enhancing user engagement.
3. To analyze the transformation of library spaces into learning commons and their influence on collaborative learning and academic support.
4. To investigate the implementation of evidence-based library and information practices (EBLIP) in reference services.
5. To identify the role of inclusive and accessible reference services in meeting the diverse needs of library users.
6. To assess the integration of sustainability and social responsibility within reference service frameworks.
7. To provide recommendations for the continuous development of reference services in alignment with user expectations and technological advancements.

III. LITERATURE REVIEW

Thorpe's (2017) contribution enriches the discourse on reference services by positioning them within the broader mission of libraries as community anchors. The article complements other scholarly perspectives by reinforcing the idea that the sustainability of reference services depends not only on technological innovation but also on deep, meaningful engagement with diverse user communities.



Lippincott et al. (2021) enriches the discourse on library reference services by illustrating how technological innovation reshapes their scope and delivery. Their findings reinforce the notion that the future of reference services depends not only on technical adoption but also on aligning these innovations with pedagogical goals, user expectations, and sustainable institutional strategies.

Burhan et al. (2025) contribute to the literature by situating library reference services within the broader transformation of information science. Their findings reinforce the notion that the future of reference services will be defined by the interplay of technological innovation, sustainability, and inclusivity, underpinned by the ongoing adaptability of library professionals.

Rose and Johnson (2023) contribute to the literature by framing virtual reference services as more than a technological innovation—they are positioned as strategic instruments for building inclusive, future-ready libraries in the Caribbean. Their findings underscore that the success of VRS depends on aligning digital tools with user needs, supporting staff professional development, and embedding virtual services within the broader mission of academic and community engagement.

Isiaka and colleagues (2024) explore how libraries are adapting to the disruptions and opportunities presented by the **Fourth Industrial Revolution (4IR)**, which is characterized by the integration of artificial intelligence (AI), robotics, big data, cloud computing, and the Internet of Things (IoT). Their work offers insights into the transformative pressures libraries face and the evolving scope of reference services within this new paradigm.

Recent literature emphasizes the significant shift in reference services influenced by digital transformation, user behavior, and institutional priorities. Studies by Lankes (2016) and Walter (2020) have noted that the traditional reference desk is being replaced or reimaged through technology-integrated models, such as virtual reference and embedded librarianship.

Bishop (2019), have addressed the ethical dimensions of AI in libraries, while Wentz (2022) investigates how inclusive design and accessibility tools can improve service equity. Sustainability in libraries is an emerging focus, with initiatives discussed by Green Libraries Network (2021) and IFLA's Environment, Sustainability and Libraries Special Interest Group.

These works collectively inform the current study by offering insights into the tools, strategies, and theoretical frameworks guiding the transformation of library reference services in the 21st century.

The impact of emerging technologies, particularly artificial intelligence, on the delivery of reference services in libraries.

This objective focuses on understanding how new and rapidly evolving technologies—especially artificial intelligence (AI) are transforming the ways in which reference services are designed, delivered, and experienced by users. AI applications in libraries include chatbots, virtual reference assistants, natural language processing tools, automated cataloging, personalized recommendation systems, and predictive analytics. These tools enable libraries to provide round-the-clock assistance, streamline responses to frequently asked questions, and tailor services based on user behavior and preferences. The objective also considers the broader implications of these technologies for library staff and users. For librarians, AI alters traditional reference workflows, requiring new skills in data literacy, ethical technology use, and AI oversight. For users, AI offers convenience and improved access but may also introduce challenges such as reduced human interaction, privacy concerns, or information reliability.

By examining this impact, the study aims to assess both the benefits and limitations of integrating AI in library reference environments and to offer guidance on ethical and effective implementation strategies.

The use of digital and hybrid reference service models and how well they increase user engagement.

This objective investigates how libraries are transitioning from traditional, in-person reference services to a combination of **hybrid** (both physical and virtual) and fully **digital** service models. Digital reference services include communication channels such as live chat, email, virtual appointments via video conferencing, co-browsing tools, and asynchronous messaging systems. Hybrid models integrate these digital methods with traditional face-to-face interactions, offering users multiple options for seeking help based on their preferences, locations, and schedules.

The aim is to evaluate how this new service delivery modes impact user engagement defined as the degree to which users interact with, benefit from, and remain satisfied with library services. This includes measuring response time, user satisfaction, ease of access, and the ability to meet users' information needs effectively across platforms.

Additionally, this objective explores how hybrid and digital models promote inclusivity by reaching remote users, supporting non-traditional learners, and accommodating users with disabilities or time constraints. It also considers the technological, staffing, and training challenges libraries face when implementing and maintaining these models.



Through this exploration, the study seeks to highlight best practices, identify barriers, and recommend strategies for sustaining user-centered, flexible, and accessible reference services in the digital age.

The impact on academic support and collaborative learning

This objective focuses on understanding how traditional library reference areas are being reimagined as learning commons—dynamic, flexible environments designed to support active, collaborative, and interdisciplinary learning. A learning commons typically integrates reference services with academic support units such as writing centers, tutoring services, IT help desks, multimedia labs, and group study zones. These spaces are designed not only for accessing information but also for creating, sharing, and applying knowledge.

The transformation reflects a shift from the library as a quiet, individual study space to a **social** and academic hub where students engage with peers, faculty, and support staff. This objective examines how these redesigned spaces contribute to improved academic outcomes by facilitating collaboration, encouraging peer-to-peer learning, and offering diverse learning tools and technologies.

It also explores the evolving role of reference librarians within learning commons—moving from passive help desk roles to active participants in instructional design, research consultations, and academic programming.

By analyzing this spatial and functional evolution, the study aims to evaluate how learning commons enhance the student learning experience, support institutional learning goals, and promote the library's role as a central player in higher education.

Application in reference services of evidence-based library and information practices (EBLIP).

This objective seeks to examine how **Evidence-Based Library and Information Practice (EBLIP)** is being applied to the planning, delivery, and evaluation of reference services. EBLIP is a decision-making framework that encourages librarians to integrate the **best available research evidence, professional expertise, and user needs and preferences** when designing and assessing services.

In the context of reference services, EBLIP involves using both qualitative and quantitative data—such as usage statistics, user feedback, case studies, and peer-reviewed research—to inform improvements and innovations. For example, reference librarians might analyze patterns in virtual chat usage to determine peak service times or use surveys to assess the effectiveness of instructional sessions.

The goal of this objective is to understand how libraries use EBLIP to ensure that their reference services are **user-centered, efficient, and responsive to changing demands**. It also considers the challenges of implementing EBLIP, such as time constraints, limited access to research training, or organizational resistance to data-driven change.

By investigating EBLIP in practice, the study aims to promote a culture of continuous improvement in reference services and support the professional development of librarians as reflective, evidence-informed practitioners.

The role of inclusive and accessible reference services in meeting the diverse needs of library users.

This objective focuses on examining how libraries design and deliver reference services that are **inclusive**—welcoming and responsive to users of all backgrounds, abilities, and identities—and **accessible**, meaning they can be used by individuals regardless of physical, sensory, cognitive, or technological limitations.

Inclusive and accessible reference services aim to eliminate barriers that traditionally marginalized or underserved groups may face when seeking information or assistance. This includes users with disabilities, linguistic minorities, non-traditional learners, senior citizens, and those from socio-economically disadvantaged backgrounds.

Examples of inclusive practices include:

- Providing assistive technologies (screen readers, Braille resources, text-to-speech tools)
- Offering multilingual support and culturally relevant resources
- Ensuring websites and virtual reference platforms comply with accessibility standards (like WCAG)
- Creating a welcoming environment through staff training in equity, diversity, and inclusion (EDI)
- Designing services for varied literacy levels or educational backgrounds

The objective also explores how such services improve user satisfaction, engagement, and learning outcomes by ensuring that **every patron has equitable access to reference support**. It encourages libraries to assess their current practices and adopt strategies that foster fairness, empathy, and universal design in all aspects of reference interaction.

The integration of sustainability and social responsibility within reference service frameworks.

This objective examines how libraries incorporate **sustainability principles and social responsibility values** into the planning and execution of reference services.



In this context, sustainability refers not only to environmentally responsible practices but also to the long-term viability of library services in terms of economic, technological, and social impact. Social responsibility involves libraries actively contributing to the well-being of communities by promoting equity, justice, and public awareness of social issues.

In reference services, integration of sustainability might include:

- Offering digital rather than printed resources to reduce paper usage
- Implementing energy-efficient technology in reference areas
- Promoting the use of open educational resources (OER)
- Designing services that are scalable and maintainable within existing budgets

Socially responsible reference service practices may involve:

- Supporting information literacy on climate change, health, or civic rights
- Curating resources for underserved or marginalized communities
- Partnering with local organizations for outreach or awareness campaigns
- Ensuring equitable access to resources regardless of a user's socio-economic status

This objective encourages libraries to reframe reference services not just as information transactions but as **tools for community empowerment and global citizenship**. By assessing how these values are reflected in policies, services, and librarian roles, the study aims to highlight the library's evolving function as a sustainable, socially conscious institution.

Summary Table of Trends

Trend Area	Key Development	Implications
AI & Automation	Chatbots, recommendation engines, generative AI use	Efficiency gains; requires ethical oversight
Digital & Roving Reference	Virtual chat, moving librarian models	Greater reach; demands tech-savvy staff
Learning Commons	Integrated support services in shared spaces	Enhanced student engagement; repurposes reference roles
Evidence-Based Practice	Data-driven decision making	Improved service effectiveness
Accessibility Tools	AI-assisted aids for users with disabilities	Inclusive access; privacy considerations
Consortial Collaboration	Shared systems, training, collections	Cost efficiencies, expanded offerings
Sustainability & Social Role	Eco initiatives, community engagement	Aligns libraries with wider social goals

IV. IMPACT ON LIBRARIES IN INDIA

The evolving trends in reference services have begun to significantly influence Indian libraries, particularly in academic and urban public institutions.

With the expansion of digital India initiatives and the adoption of the National Education Policy (NEP) 2020, libraries across the country are under increased pressure to modernize their services and enhance digital literacy among users.



Many university libraries in India have introduced digital reference tools, such as email consultations, WhatsApp-based queries, and online chat services. Institutions like the Indian Institutes of Technology (IITs) and central universities are piloting AI-powered discovery tools and integrated library systems to improve user access to information.

The learning commons model is also gaining traction, especially in private universities and premier research institutions where libraries are reconfiguring physical spaces to promote collaborative learning, group study, and access to academic support services. However, such developments remain uneven across regions, with rural and state-run libraries facing infrastructural and staffing constraints.

Moreover, Indian librarians are gradually embracing evidence-based practices, supported by training programs offered through institutions like INFLIBNET and professional bodies such as the Indian Library Association (ILA). Efforts to promote inclusive services—like Braille sections, accessible digital platforms, and multilingual support—are also emerging in response to diverse user needs.

Despite these positive developments, challenges persist. Limited funding, digital divide issues, and lack of professional development opportunities hinder the widespread adoption of global reference trends in many Indian libraries. Nonetheless, the overall trajectory suggests a growing alignment with international standards, driven by policy support, technological advancement, and rising user expectations.

The effects of library professionals

Library staff plays a pivotal role in the successful transformation of reference services. Their adaptability, technical competence, and commitment to user service determine how effectively new models are implemented and sustained. As libraries increasingly adopt AI tools, digital platforms, and hybrid service approaches, staff must acquire and continually update their skills in information technology, digital communication, and inclusive service practices.

Staff engagement directly impacts user satisfaction, especially in environments where personalized support, cultural sensitivity, and proactive assistance are essential. Training programs, professional development workshops, and collaborative learning opportunities are critical to equipping librarians with the competencies required in a rapidly evolving landscape.

Furthermore, staff attitudes and openness to innovation influence the organizational culture and the pace at which reference services evolve. Librarians who actively participate in service redesign, user research, and evidence-based practices contribute to a dynamic and responsive library ecosystem. Ultimately, the success of contemporary reference services depends not only on infrastructure and technology but also on the human expertise and empathy of the library professionals who deliver them.

V. CONCLUSION

The study demonstrates that library reference services are in a state of significant transition, shaped by digital innovation, hybrid service models, learning commons, inclusivity, evidence-based practice, and sustainability. While technology expands the scope and efficiency of services, the expertise and adaptability of library staff remain central to effective delivery. The Indian context illustrates both progress and persistent challenges, particularly regarding infrastructure, training, and equitable access.

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International Journal of Recent Development in Engineering and Technology
Website: www.ijrdet.com (ISSN 2347-6435(Online) Volume 15, Issue 02, February 2026)

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