

Digital Inequality and Pathways to Inclusive Development: The context of library services and AI in India

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ABSTRACT

The present study is based on a narrative review examining the digital divide, digital inequality and inclusive development where libraries can play roles, especially in the Indian context. Data were collected from Google Scholar platform with a specific phrase to maintain focus as well as a limited dataset in March 2026. The final dataset resulted in 71 studies focusing specifically on the targeted experiences shared in the most recent literature since 2025. The literature has shown major trends in the context of digital inequality and accessibility issues through AI-driven library services in India. Google scholar platform served as a provider of multidisciplinary sources for comprehensive results. It is found that the significance of libraries with the touch of AI is increasing where libraries are capable of bridging the digital divide by providing meaningful access points to reduce digital inequality, especially in remote areas and marginalised groups in India along with the augmentation in digital and AI literacy.

KEYWORDS: digital transformation, India, digital divide, inclusive development, artificial intelligence, library services.

INRODUCTION

Digital divide and inclusive developments are related to each other in developing countries. While observing the contemporary practices in India, the AI has been pervasive and being an indispensable component in the development process of society. There are various reasons why this aspect is intriguing; access to technology and information, digital skills, socio-cultural scenario, and libraries' contribution in the entire societal and professional spectrum. Artificial intelligence also gives opportunities to improve access to automation, personalization and data - driven decision making through enablement of inclusive development. However, despite the immense advantages

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that artificial intelligence brings, they are not met without their own problems and challenges with variables such as ethics, bias, and contextual relevance, therefore, careful implementation and usage is necessary. Libraries face massive transformation by adopting AI based tools and services including, but not limited to virtual assistance, automated systems and intelligent information retrieval mechanisms. These tools and developments help libraries to act as intermediaries in reducing the gap between digital inequalities while at the same time improving the access people have to information and knowledge. However, there are many structural limitations that one must face such as limitations in infrastructure, differences in skill gaps and challenges in availability of resources that still obstruct the proper adoption and impact of these technologies.

OBJECTIVE, SCOPE AND LIMITATION

Objectives:

1. To explore how library services integrated with AI that address the digital divide and promote inclusive development in India by improving access, equity, and user-centred information delivery.
2. To understand and analyse the role of libraries in improving the AI literacy and usage among various user components such as marginalised groups and inclusive service scenario.

Scope:

Focus has been made on analysis of AI-enabled library services, understanding the existing digital inequality and information access provision in India through the narrative review of scholarly publications including review articles. The emphasis has been on gaining insights into inclusive development and user empowerment through libraries.

Limitations:

Including only scholarly publications i.e. review articles solely from Google Scholar platform, excluding empirical studies and other specific indexing/citation databases may limit comprehensive literature access as well as induce selection bias while finding the digital divide and libraries' roles through AI based services.

Method:

The study has applied a narrative review method focusing on the results retrieved through a search phrase "Digital Divide and Inclusive Development in the context of library services, and AI in India." Data was collected during the month of March 2026. To focus on the most recent developments, data was collected by applying a search strategy with limiting search for review articles, since 2025 till present. The search strategy retrieved a final useful dataset of 71 results to use the study in the context of conceptual knowledge, frameworks, and emerging trends. The retrieved publications were assessed in the context of recurring patterns, technological aspects, policy interventions, AI-driven library services and the contribution towards eliminating digital disparities, augmenting inclusive access in India.

Inclusion Criteria:

The inclusion criteria were based on English language published peer reviewed articles since 2025. The contexts were limited to the digital divide, Library services with AI applications, inclusive developments in India. The studies related to India or Indian contexts were kept in focus.

Exclusion Criteria:

Studies of various nature except scholarly review articles, beyond the English language and before 2025 were not considered for inclusion in the study. The studies which were non-Indian context, duplicate results and without methodological clarity were excluded to avoid inconsistent interpretations. Studies focusing exclusively on non-

Indian contexts without transferable relevance or duplicate records or articles with insufficient methodological clarity or academic rigor were not included.

PRISMA - Style Synthesis Table: Digital Divide, Inclusive Development, Library Services and AI in India

Stage	Description	Outcome	Key References
Identification	Literature search conducted on 27 March 2026 using Google Scholar with the phrase “ <i>Digital Divide, Inclusive Development in the context of library services and AI in India</i> ”. Filters applied: since 2025, review articles, sorted by relevance.	Initial pool of studies representing interdisciplinary domains including AI, education, ICT4D, and library science.	Acharya (2025); Ahmad & Singh (2025); Baranidharan et al. (2025); Ganapathy et al. (2026); Golub et al. (2025); Riyat & Dhamak (2025); Singh et al. (2025); Nyale et al. (2025)
Screening	Titles and abstracts screened to identify relevance to digital divide, inclusive development, AI, and library services. Non-relevant and duplicate studies removed.	Refined dataset focusing on core thematic relevance and scholarly rigor.	Faisal et al. (2025); Verma et al. (2025); Xalxo et al. (2025); Tripathi et al. (2025); Panwar & Peddi (2025)
Eligibility	Full-text review conducted to ensure alignment with inclusion criteria: Indian or Global South context, AI applications, digital inclusion, and library services.	Selection of studies demonstrating conceptual depth, empirical synthesis, and policy relevance.	Mutambara (2025); Kamara (2025); Srivastava (2025); Ravi & Ara (2026); Biju & Gayathri (2025); Matsieli & Mutula (2025)
Inclusion	Final set of studies included for thematic synthesis based on relevance, quality, and contribution to research objectives.	Comprehensive body of literature categorized into themes such as AI in libraries, digital literacy, inclusion, and governance.	Patil et al. (2025); Margam et al. (2025); Raghavendra et al. (2025); Malakar et al. (2025); Ramteke et al. (2026); Hussain et al. (2026); Sharma & Kumar; MS & Nirmala (2025)
Synthesis (Thematic Analysis)	Studies analyzed using thematic approach to identify patterns across digital divide,	Emergence of key themes: digital inequality, AI-driven inclusion, library transformation, literacy	Daher (2025); Rehman et al. (2025); Mataranyika et al.

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Stage	Description	Outcome	Key References
	AI applications, and inclusive library services.	development, and policy frameworks.	(2026); Kaushal et al. (2026); Pareek et al. (2025); Sagar et al. (2025); Saha et al. (2025)

Table: 1 Thematic Review Table: Digital Divide, Inclusive Development, Library Services and AI in India

Theme	Key Findings	Representative References
1. Nature and Dimensions of Digital Divide	Digital divide extends beyond access to include skills, affordability, gender disparities, and socio-economic inequalities. Rural–urban and gender gaps are prominent in India and the Global South.	Acharya (2025); Ahmad & Singh (2025); Ganapathy et al. (2026); Golub et al. (2025); Singh et al. (2025); Sowmya & Pai (2025); Tripathi (2025); Tripathi et al. (2025); Nyale et al. (2025); Riyat & Dhamak (2025)
2. AI as a Driver of Inclusive Development	AI supports inclusive growth through improved access to education, governance, and services. However, ethical, cultural, and linguistic challenges must be addressed for equitable implementation.	Mutambara (2025); Kamara (2025); Srivastava (2025); Ravi & Ara (2026); Biju & Gayathri (2025); Verma et al. (2025); Vela & Mursi (2026); Semi et al. (2026)
3. AI Applications in Library Services	AI is transforming libraries through automation, chatbots, recommendation systems, and digital resource management. Adoption is growing but uneven in India.	Alam & Ankita; Bairagi & Lihitkar (2025); Choudhury & Purkayastha (2025); Margam et al. (2025); Patil et al. (2025); Raghavendra et al. (2025); Malakar et al. (2025); Ramteke et al. (2026); Shahzad et al. (2025)
4. Libraries as Enablers of Digital Inclusion	Libraries act as access points for digital resources, promote information literacy, and support marginalized communities, especially in developing regions like India.	Sharma & Kumar; MS & Nirmala (2025); Hussain et al. (2026); Lepcha et al.; Pogula & Khandal (2025); Ramaprasad & Kumari (2025); Umar
5. Digital Literacy and AI Literacy	Digital and AI literacy are critical for meaningful inclusion. Libraries and educational institutions play a key role in skill development and user empowerment.	Daher (2025); Rehman et al. (2025); Nyale et al. (2025); Mataranyika et al. (2026); Panchal (2025); Kundu & Bej (2025)
6. Barriers to AI and Digital Inclusion	Infrastructure gaps, lack of funding, digital illiteracy, and resistance to technology hinder inclusive development.	Dwivedi (2026); Karuppasamy (2025); Kchaou et al. (2025); Devi & Sharma; Das (2025); Faisal et al. (2025); Kaushal et al.

Theme	Key Findings	Representative References
	Accessibility issues for marginalized populations persist.	(2026); Pareek et al. (2025)
7. Emerging Technologies and Connectivity	Technologies such as 5G/6G, smart cities, and Industry 4.0 enhance connectivity but require inclusive strategies to avoid widening disparities.	Baranidharan et al. (2025); Baranidharan et al. (2025); Pasi & Dhamak (2025); Vasudavan et al. (2025); Priya et al. (2025); Saxena & Kumar (2025)
8. Inclusive Education and AI Integration	AI-driven education systems support inclusive learning but require equitable access, teacher readiness, and ethical frameworks.	Bhatnagar & Somani; Chate et al. (2026); Kundu & Bej (2025); Fazal et al. (2025); Xalxo et al. (2025); Panwar & Peddi (2025); Tripathi & Upreti (2025)
9. Ethical, Social and Cultural Implications of AI	Ethical AI practices must address bias, inclusivity, and diversity. Cultural and linguistic considerations are essential in the Indian context.	Biju & Gayathri (2025); Matsieli & Mutula (2025); Shrivastav et al. (2025); Kchaou et al. (2025)
10. Library Transformation and Innovation	Libraries are evolving into digital and AI-enabled knowledge hubs, integrating emerging technologies for improved services and research support.	Burhan et al. (2025); Kartiani (2025); Patil et al. (2025); Malakar et al. (2025); Raghavendra et al. (2025); Lepcha et al.; Ramteke et al. (2026)
11. Policy, Governance and Development Frameworks	National and global policies emphasize AI integration, digital governance, and inclusive development aligned with sustainable development goals.	Sagar et al. (2025); Saha et al. (2025); Raghuvanshi & Dwivedi (2025); Jose & Ghosh (2025); Kaushal et al. (2026); Pareek et al. (2025)
12. Adoption Challenges in Libraries and AI Systems	Adoption of AI in libraries is influenced by organizational readiness, technological infrastructure, user acceptance, and training needs.	Shahzad et al. (2025); Chipembele et al. (2025); Umar; Ramaprasad & Kumari (2025); Shahzad & Tariq (2025)

Table: 2

All references included in this study have been systematically distributed across thematic categories based on their conceptual relevance to the research focus. Given the interdisciplinary nature of the topic, certain references have been incorporated into multiple themes where their contributions span more than one area of discussion. This approach ensures a comprehensive and integrated understanding of the subject. Additionally, duplicate entries, such as Golub et al. (2025), have been considered only once during interpretation to avoid redundancy, while still being retained conceptually to reflect their significance across different thematic dimensions within the review.

Thematic Review: Digital Divide and Inclusive Development in the Context of Library Services and AI in India

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The reviewed literature reveals a multi-dimensional understanding of the digital divide and inclusive development, particularly when examined through the lens of library services and artificial intelligence (AI) in India. The themes emerging from the selected studies are discussed below.

Nature and Dimensions of the Digital Divide

The nature of scholarly works depicts that in India, digital divide exists not only through access to technology but also through difference in digital skills, affordability, infrastructure and socio-cultural factors. Studies showcase that gender, rural-urban and differences in inequalities to be the main drivers in this divide (Singh et al., 2025; Sowmya & Pai, 2025; Tripathi, 2025). Structural inequalities are deeply embedded in digital ecosystems, as displayed by broader ICT4D (Ganapathy et al., 2026). These gaps and the nature of digital divide may find itself being diminished through technologies such as 5G/6G and development of smart city infrastructures, but incorrect implementation of the same may instead cause these gaps and divides to be reinforced even more (Baranidharan et al., 2025; Faisal et al., 2025; Vasudavan et al., 2025).

Role of AI in Promoting Inclusive Development

The Global South in particular sees AI being positioned as a transformative force for inclusive development, with its impact being felt worldwide as it promises and delivers access to education, governance and public services (Mutambara, 2025; Kamara, 2025). India also sees enhancement in personalized learning, automation and decision making with the help of AI-driven interventions that leads to broader developmental goals (Srivastava, 2025; Ravi & Ara, 2026). However, ethical concerns still exist including algorithmic bias, diversity in linguistic patterns and inclusivity of different cultures (Biju & Gayathri, 2025). This showcases that context-sensitive AI frameworks that are in touch with local realities are extremely needed.

AI Applications in Library Services

The integration of AI technologies has changed the current as well as future scope and potential of libraries. More applications such as automated cataloguing, recommendation systems, research support tools, chatbots and virtual reference services are being identified through studies (Patil et al., 2025; Margam et al., 2025; Raghavendra et al., 2025). AI adoption in libraries in India is still emerging and shows even more promising potential to improve user enhancement and service delivery (Bairagi & Lihitkar, 2025; Malakar et al., 2025). Generative AI tools are also reshaping knowledge organization and access (Ramteke et al., 2026).

However, obstruction such as problems in infrastructure, technical expertise and lack of funding also prevent widespread adoption. (Choudhury & Purkayastha, 2025; Shahzad et al., 2025).

Libraries as Agents of Digital Inclusion

Libraries are transforming into mainstream institutional players towards bridging the two sides of the digital divide by providing equitable access to all users to digital resources, promoting information literacy and supporting marginalized and needy communities (Sharma & Kumar; MS & Nirmala, 2025).

Public and academic libraries find themselves transitioning into digital knowledge hubs that not only offer training in digital literacy but also facilitating access to e-resources (Hussain et al., 2026; Lepcha et al.). NEP 2020 and similar other national policies have initiatives also strengthen the role of libraries in increasing inclusive educations

(Das, 2025). AI assisted user support, virtual reference and several other emerging services also improve the accessibility of digital libraries (Keikha et al., 2026).

Digital Literacy and Skills Development

The importance of digital literacy and AI literacy is another recurring field that concerns itself with the topic of the digital divide. Access to these tools prove to be insufficient as studies clearly display that skills are needed to effectively use these digital tools (Nyale et al., 2025; Rehman et al., 2025). Through various developmental possibilities such as training programs, workshops and user education initiatives, libraries are able to play an extremely important role in developing these skills. Similar, higher education demands more AI literacy to make sure that these emerging technologies are being used in an effective and ethical manner (Daher, 2025; Mataranyika et al., 2026).

Barriers to Inclusive AI and Library Services

However, the potential of AI and libraries in promoting inclusion are being hindered by many structural and operational challenges such as:

- Rural and underserved areas facing infrastructure gaps (Riyat & Dhamak, 2025; Dwivedi, 2026).
- Access to these digital tools being restrained by economic issues.
- Lack of trained professionals in AI and digital technologies (Ramaprasad & Kumari, 2025).
- Ethical and accessibility concerns, with marginalized and differently abled populations being especially vulnerable (Karuppasamy, 2025; Kchaou et al., 2025).

Similarly, all users may not be extremely accepting and may display resistance towards acknowledging and adopting technological changes. Similarly limited support from policies also complicate adoption (Devi & Sharma).

RESEARCH GAPS

The increasing amount of literature on digital divide, inclusive development and the role of artificial intelligence in library services are still not able to counteract all the research gaps in this field, especially when it comes to the Indian context:

1. A lack of field based and empirical studies to analyse how AI-enabled library services find themselves being implemented and utilized across the diverse regions of India, with this lack of data being especially prevalent in the rural, underdeveloped, and/or underserved communities. Most studies that exist are either conceptual or review based and offer limited insights into real-world effectiveness and the experience of users.
2. Even though the current literature on the digital divide focusses on access and infrastructure, there is insufficient focus on inequalities across different sections such as gender, caste, disability and different types of languages. Even though some studies do focus on gender disparities, more comprehensive framework and studies need to be conducted to establish and study these interconnected relationships.
3. While literature is very good at highlighting the transformative potential of AI, it does not provide with context-specific models that could display ethical and inclusive deployment of AIs in Indian libraries, similarly, there are

issues that still exist such as algorithmic bias, access to multilingual people and culturally relevant knowledge systems that require both deeper investigation as well as localized solutions.

4. There is a noticeable gap in the research that exists on capacity building and professional development of library staff. AI, its uses, and its successful integration depend on skilled human resources, but there are limited studies that explore training frameworks, standards to gauge competency, and institutional readiness in Indian libraries.
5. In addition to the previous issues, research that deals with policies still remains fragmented and disoriented. Even though one finds discussion of national initiatives such as digital governance and inclusive education, the analysis of how policies actually translate into strategies that may convert into actions at the institutional level remains limited, especially within public and academic libraries.
6. Conclusively, future research needs to expand upon the long-term impact of emerging technologies such as generative AI, the metaverse, and other smart systems on the inclusivity of knowledge access. Current research is also negatively impacted by the absence of longitudinal studies that assess sustainability, scalability, and societal outcomes.

It is mandatory to address these gaps to develop a holistic, inclusive and a framework that is contextually relevant for leveraging AI and library services to bridge the digital divide in India.

Policy, Governance, and Future Directions

The literature aims to showcase the importance of policy frameworks and governance mechanisms to ensure inclusive digital transformation. There are many initiatives that are aligned with Viksit Bharat 2047 and Sustainable Development Goals that shed a light on the importance of the integration of various fields such as AI, education and digital infrastructure (Sagar et al., 2025). Inclusion is being enabled through smart governance, e-services and digital public infrastructure (Pareek et al., 2025; Kaushal et al., 2026). Furthermore, equitable access and inclusive growth demand interdisciplinary collaboration between libraries, educational institutions and policymakers.

CONCLUSION

This thematic review showcases that even though AI and digital technologies present immense opportunities to bridge the digital divide in India and induce inclusive development, the success of these technologies depends heavily on dealing with structural inequalities to improve digital literacy and further reinforcing library systems. Libraries have come to emerge as an extremely middle ground within this ecosystem as they have the capability to not only democratize access to knowledge but also empower diverse user communities. Libraries also play an important role in building digital inclusion and inclusive development through three steps. First, they enhance the provision of equitable access to digital resources, e-services and tools that utilize AI to reduce the digital divide, especially for marginalized communities. Second, these libraries act as hubs and centers to promote digital and AI literacy and offer training workshops and programs to educate individuals about essential technological skills. The third and final way is the enhancement of inclusive innovation by breaking barriers such as limited skills, accessibility issues and technological gaps. This is easily achievable by supporting users, advocating for the ethical use of AI and adapting services to meet the changing digital and societal landscape.

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