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Digital Financial Inclusion in Nationalised Banks in India: A Literature Review

Mr. Abhinav Devidas Jadhav[1], Prof. Dr. Tanaji Dabade[2], Prof. Dr. Sunil Khilari[3], Prof. Dr. Balasaheb Bhamangol[4], Prof. Tushar Nivangune[5]

[1]Research Scholar, Navsahyadri Group of institutions, Savitribai Phule Pune University, Pune, Maharashtra India
[2]Director, Navsahyadri Group of Institutions, Savitribai Phule Pune University, Pune, Maharashtra India
[3]Research Head, Navsahyadri Group of Institutions, Savitribai Phule Pune University, Pune, Maharashtra India
[4]HOD, Navsahyadri Group of Institutions, Savitribai Phule Pune University, Pune, Maharashtra India
[5]Asst. Professor, Navsahyadri Group of Institutions, Savitribai Phule Pune University, Pune, Maharashtra India

ABSTRACT

The integration of Digital technologies into the Indian Banking sector has fundamentally altered the landscape of Financial Inclusion. Nationalised banks, serving as the primary vehicles for government-mandated financial outreach, play a critical role in bridging the gap between traditional banking infrastructure and the unbanked population. This paper presents a comprehensive literature review examining the trajectory, adoption, and impact of Digital Financial Inclusion (DFI) driven by Indian Public Sector Banks (PSBs). By synthesizing existing studies, this review categorizes the literature into key themes: the architectural shift toward digital platforms, the deployment of technology for last-mile delivery, and the socio-technical barriers impeding widespread adoption, such as digital literacy and regional infrastructural disparities. Furthermore, this study identifies critical gaps in the current academic discourse, particularly concerning the specific user-centric challenges of PSB digital interfaces and the long-term operational viability of the Business Correspondent (BC) model. The findings provide a structured foundation for future empirical research aimed at optimizing Digital financial services for targeted demographics.

***Keywords*— Digital Financial Inclusion, Nationalised Banks, Public Sector Banks, Unified Payments Interface (UPI), Financial Literacy, Literature Review.**

INTRODUCTION

Financial inclusion remains a cornerstone of sustainable economic development and poverty alleviation, particularly in emerging economies like India. Historically, the strategy for bringing marginalized and rural populations into the formal economic fold relied heavily on expanding the physical footprint of bank branches. However, the advent of accessible digital technologies has catalysed a paradigm shift, transitioning the focus from brick-and-mortar expansion to Digital Financial Inclusion (DFI). At the forefront of this structural Transformation are India's nationalised or Public Sector Banks (PSBs). Due to their vast geographical networks and inherent mandate to execute Governmental financial policies—most notably the Pradhan Mantri Jan Dhan Yojana (PMJDY)—PSBs bear the primary responsibility for democratizing access to modern financial services.(Reserve Bank of India, 2025; Sen & Srivastava, 2023). While private sector institutions often lead in rapid technological innovation, Nationalised banks face a unique dual challenge: they must modernize extensive legacy systems while simultaneously catering to a highly diverse, often non-digitally native customer base.(Singh & Malit, 2023). The proliferation of the Unified Payments Interface (UPI), mobile banking applications, and Aadhaar-enabled Payment Systems (AePS) has provided PSBs with the mechanisms to significantly reduce the cost and friction of last-mile service delivery.Singh & Sharma, 2024).Yet, achieving meaningful DFI extends beyond mere technological deployment; it requires sustained user engagement, comprehensive digital literacy, and resilient rural network infrastructure.(Koefer& Preziuso, 2024).

Despite a rapidly growing body of literature addressing financial technology (FinTech) in India, a consolidated review focusing exclusively on the efforts, challenges, and outcomes of DFI within the specific operational context of nationalised banks is highly necessary. Academic discourse frequently conflates the digital initiatives of private and public banks, which obscures the distinct socio-economic obligations, regulatory pressures, and customer demographics unique to PSBs. (Ministry of Micro, Small and Medium Enterprises [MSME], 2025; Agarwal, 2024).This evolution is further complicated by the emergence of Artificial Intelligence (AI), which presents both

leadership opportunities and complex civilisational challenges for the Indian banking legacy (Sharma, 2026).Consequently, this paper aims to systematically review and synthesize the existing literature on DFI initiatives undertaken by Indian nationalised banks. By mapping the current state of research, this review highlights the thematic progression of digital banking adoption, evaluates the persistent barriers to inclusion, and identifies critical empirical gaps in the existing literature. The subsequent sections of this paper are organized as follows: Section II details the methodology of the literature review process; Section III provides a thematic analysis of the synthesized research; Section IV outlines the identified research gaps; and Section V concludes the paper while offering concrete directions for future study.

REVIEW METHODOLOGY

To address the need for a consolidated review highlighted above, this study adopted a systematic approach to ensure a rigorous and comprehensive theoretical foundation, to identify, filter, and analyze relevant academic literature and policy documents. The methodology was designed to capture the multidimensional nature of Digital Financial Inclusion (DFI) by examining it through the intersecting lenses of computer management and business management, specifically focusing on the critical evolution seen between 2020 and 2025 **(**Dadasaheb & Bhosale, 2026). This dual approach facilitates a deeper theoretical understanding of how advanced technological deployments—ranging from mobile interfaces to artificial intelligence—align with the operational frameworks and public mandates of Indian nationalised banks.(JETIR, 2026; World Bank, 2025).

A. Search Strategy and Data Sources

The literature search was conducted across multiple prominent academic databases to ensure a wide and representative sample of current scholarly work. The primary databases utilized included Scopus, Web of Science, IEEE Xplore, and Google Scholar. Additionally, to capture localized theoretical frameworks and indigenous research highly relevant to the Indian context, the Shodhganga repository was consulted. The search utilized targeted Boolean keyword combinations to isolate pertinent studies, focusing on the latest developments in technological architecture (Chatterjee, 2023). The primary search strings included: ("Digital Financial Inclusion" OR "DFI" OR "Digital Banking") AND ("Nationalised Banks" OR "Public Sector Banks" OR "PSB") AND ("India" OR "Rural Finance" OR "Financial Technology").

B. Inclusion and Exclusion Criteria

To maintain the academic integrity and theoretical focus of the review, strict inclusion and exclusion criteria were established.

Inclusion: The review incorporated peer-reviewed journal articles, national and international conference proceedings, and authoritative policy reports published by regulatory bodies such as the Reserve Bank of India (RBI) and the National Bank for Agriculture and Rural Development (NABARD). The timeframe for inclusion was restricted to publications from the last decadewith a specific emphasis on the post-2020 digital acceleration to capture the most recent waves of digital transformation, particularly following the widespread adoption of the Unified Payments Interface (UPI)on banking ecosystems (Reserve Bank of India, 2025; Singh & Sharma, 2024).

Exclusion: Articles that were not peer-reviewed, generalized opinion pieces, and studies exclusively analyzing private sector banks or international financial institutions without relevance to the Indian PSB framework were excluded. This ensured the synthesized literature remained strictly focused on the unique operational realities of nationalised banks.(Mishra & Rao, 2023).

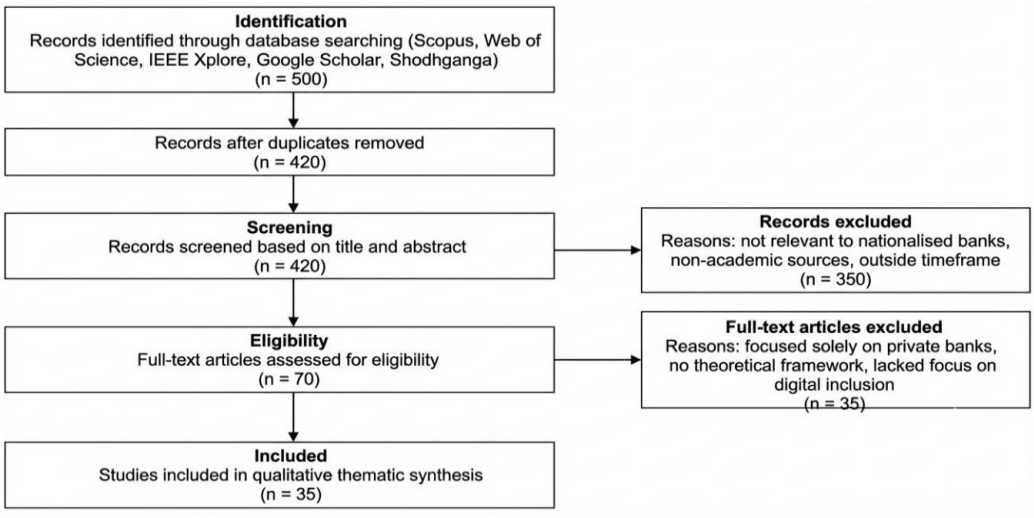

Fig. 1. PRISMA flow diagram illustrating the systematic literature selection process.

C. Thematic Synthesis Approach

Given the predominantly theoretical nature of this paper, a descriptive and thematic synthesis method was employed rather than a statistical meta-analysis. The selected literature was critically evaluated to identify recurring conceptual models, operational challenges, and strategic innovations. The analysis specifically focused on how nationalised institutions manage the integration of complex digital systems while navigating the socio-economic barriers inherent in serving unbanked and marginalized populations.(Kumar & Gupta, 2024).

The synthesized data was subsequently categorized into distinct thematic domains—ranging from technological architecture to socio-economic empowerment—which are discussed extensively in the following section. This categorization aligns with modern ethical frameworks for financial inclusion in developing economies (IISPPR, 2026).
As illustrated in the conceptual framework (see Fig. 2), a critical synthesis of recent studies yields three primary thematic domains. The extant literature on Digital Financial Inclusion (DFI) within the Indian context reveals a complex interplay between technological advancement, socio-economic realities, and institutional mandates. A critical synthesis of recent theoretical and empirical studies yields three primary thematic domains: the evolution of technological architecture, the socio-technical barriers to adoption, and the socio-economic empowerment of targeted demographics. These intersecting domains are illustrated in the conceptual framework as follows. (seeFig. 2).

THEMATIC ANALYSIS OF LITERATURE

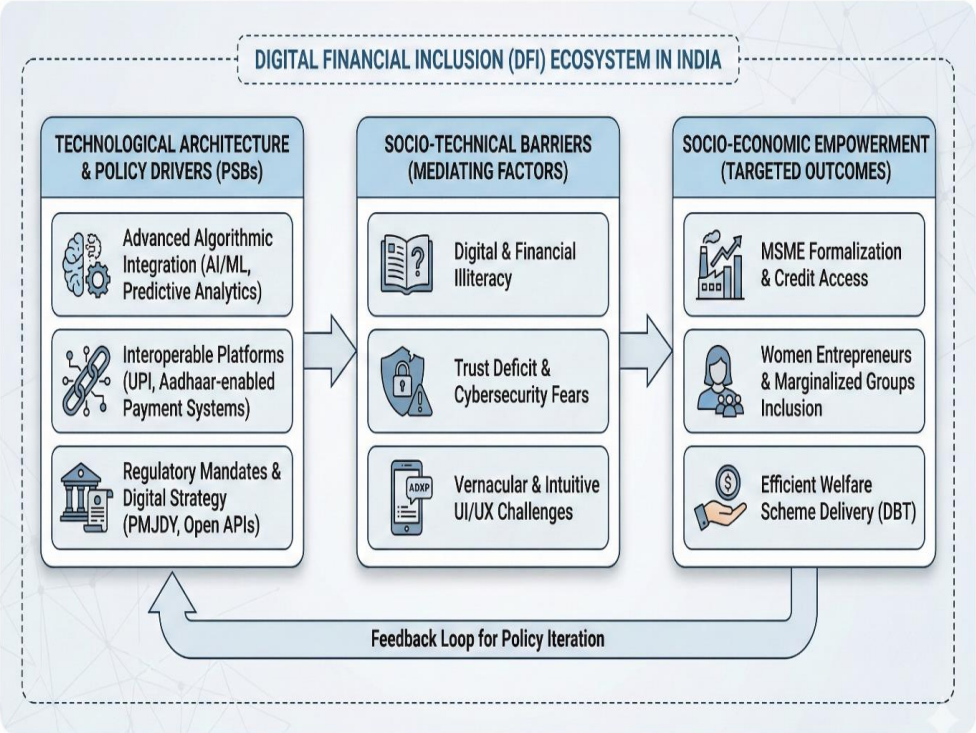

Fig. 2. Conceptual Framework illustrating the interplay of technology, barriers, and empowerment in PSB-driven DFI.

Fig. 2. Conceptual framework illustrating the interplay of technology, socio-economic barriers, and institutional policy in PSB-driven DFI.

A. Technological Architecture and Advanced Algorithmic Integration:

The foundational theme prevalent in the literature centres on the architectural evolution of Public Sector Banks (PSBs). Early studies predominantly focused on basic digitization, such as the deployment of core banking solutions (CBS) and automated teller machines (ATMs). However, recent scholarship highlights a critical transition toward advanced digital ecosystems and interoperable architectures (JETIR, 2026; Chatterjee, 2023). Current theoretical models emphasize the integration of Artificial Intelligence (AI) and machine learning algorithms within global finance and their localized application in Indian DFI.(Sharma, 2026; Verma & Khanna, 2025).

Literature suggests that nationalised banks are increasingly utilizing AI-driven predictive analytics to develop alternative credit scoring models. These models bypass traditional collateral requirements, analyzing alternative data points (such as mobile usage and utility payments) to extend credit to the historically unbanked. (Sharma & Desai, 2025; NITI Aayog, 2023)Furthermore, researchers emphasize the theoretical importance of interoperable architectures, most notably the Unified Payments Interface (UPI). The literature robustly supports the premise that an open-API (Application Programming Interface) ecosystem is fundamental to scalable DFI, allowing PSBs to interface seamlessly

with third-party FinTech providers without compromising regulatory oversight.(Singh & Sharma, 2024; Chatterjee, 2023)

B. Socio-Technical Barriers to Adoption

A significant portion of the academic discourse is dedicated to the friction between digital availability and actual user adoption. Theoretical frameworks in this domain frequently draw upon the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT). When applied to the demographic base of nationalised banks, researchers identify a pronounced "digital divide" characterized by infrastructural and psychological barriers. (Kumar & Gupta, 2024; Dadasaheb & Bhosale, 2026).

The literature consistently identifies digital illiteracy as the primary impediment to DFI. While mobile penetration in rural India is high, financial digital literacy remains disproportionately low. (Koefer& Preziuso, 2024). Scholars note that the user interfaces (UI) of many PSB applications are often designed with urban, English-speaking consumers in mind, creating cognitive barriers for rural usersand highlighting the need for vernacular-intuitive design. (Mishra & Rao, 2023). Additionally, trust deficit emerges as a recurring theoretical construct. Studies indicate that a lack of robust cybersecurity awareness, coupled with the fear of digital fraud, deters marginalized populations from transitioning away from cash-based transactions, despite the availability of digital infrastructure.(Agrawal, 2026; Kumar & Gupta, 2024).

C. Socio-Economic Empowerment of Targeted Demographics and MSMEs

The final, and perhaps most economically critical, theme within the literature explores the targeted impact of DFI on specific socio-economic strata. Nationalised banks function as the primary conduits for government welfare schemes, making their digital outreach pivotal for inclusive growth.(Reserve Bank of India, 2025; Sen & Srivastava, 2023). Academic analysis frequently measures the success of DFI through its impact on Micro, Small, and Medium Enterprises (MSMEs) and women entrepreneurs.(Agarwal, 2024; Ministry of Micro, Small and Medium Enterprises [MSME], 2025).

Theoretical studies highlight that digital inclusion significantly lowers the cost of capital and transaction friction for MSMEs, integrating them into the formal supply chain. (Singh & Malit, 2023). Furthermore, literature reviewing government procurement initiatives and reservation policies often intersects with DFI research. Scholars argue that digital platforms managed by PSBs are instrumental in facilitating the transparent disbursement of targeted credit facilities to women and marginalized entrepreneurial communities. (Agarwal, 2024; Singh & Sharma, 2024).By digitizing the financial footprint of these micro-enterprises, nationalised banks theoretically enable a transition from informal, exploitative credit markets to structured, policy-backed financial empowerment.(Verma & Khanna, 2025; World Bank, 2025).

Table I provides a synthesized summary of the critical studies informing the thematic framework of this review.

Table I: Summary of Key Literature on Digital Financial Inclusion in PSBs.

Year	Author(s)	Thematic Focus	Methodology	Key Contributions
2026	**Agrawal**	Financial Regulation	Legal Review	Analyzed the "balancing act" between AI innovation and RBI regulatory guardrails.
2026	**Dadasaheb & Bhosale**	PSB Performance	Longitudinal	Assessed the 2020-2025 period; found that deep-rural adoption is the "final frontier."
2026	**IISPPR**	Ethical AI	Case Study	Proposed a localized ethical framework specifically for AI in Indian Public Sector Banks.
2026	**JETIR**	Tech Architecture	Systematic	Examined how DFI success depends on the underlying "digital rails" of the bank.
2026	**Sharma, R.**	AI Legacy	Policy Analysis	Defined AI integration in DPI as a civilizational shift for the Indian economy.
2025	**MeitY**	AI Governance	Policy Report	Provided the definitive national guidelines for governing AI in public sectors.
2025	**RBI (FREE-AI)**	Ethical AI	Committee Report	Outlined the framework for "Responsible and Ethical Enablement" of AI in banking.
2025	**Reserve Bank of India**	Banking Trends	Annual Report	Provided the baseline statistics for the growth of DFI and PSB social mandates.
2025	**Sharma & Desai**	MSME Credit	Conceptual	Proved that alternative credit scoring is vital

Year	Author(s)	Thematic Focus	Methodology	Key Contributions
				for unbanked small businesses.
2025	**Verma & Khanna**	Machine Learning	Empirical	Found that ML models are more accurate than traditional scoring for rural users.
2025	**World Bank**	Global Inclusion	Global Review	Contextualized the Indian DFI model against other Global South economies.
2024	**Agarwal, N.**	Gender Gap	Mixed Methods	Proved that digital banking directly empowers women-led micro-enterprises.
2024	**Bello**	Algorithmic Fairness	Theoretical	Argued that user satisfaction in DFI depends heavily on perceived "algorithmic fairness."
2024	**Koefer&Preziuso**	Digital Literacy	Working Paper	Identified digital illiteracy as a greater barrier than actual physical bank access.
2024	**Kumar & Gupta**	TAM & Trust	Survey/TAM	Proved that "fear of fraud" is the primary deterrent for mobile banking in rural India.
2024	**Singh & Sharma**	UPI & Interoperability	Qualitative	Analyzed UPI as the central catalyst for the interoperable banking architecture.
2023	**Chatterjee, R.**	Open-API Systems	Technical Review	Demonstrated that Open-APIs are foundational for PSB-FinTech collaboration.
2023	**Mishra & Rao**	UI/UX & Bias	Human-Computer	Identified cognitive barriers caused by non-vernacular (English-only) interfaces.
2023	**NITI Aayog**	Credit Accessibility	Strategic Paper	Outlined the roadmap for using AI to reach the "last mile" of credit delivery.
2023	**Sen & Srivastava**	Institutional Mandate	Case Study	Established that PSBs bear the primary burden of PMJDY compared to private banks.
2023	**Singh & Malit**	Digital Transformation	Issues Review	Highlighted the core challenges (legacy systems vs. modern needs) facing PSBs.

IDENTIFIED RESEARCH GAPS

Despite the proliferation of literature surrounding digital banking in India, a critical synthesis reveals substantial theoretical and empirical gaps, particularly concerning the operational realities of Public Sector Banks (PSBs). The existing academic discourse frequently adopts a generalized view of financial technology, inadvertently overlooking the nuanced intersections of computer management, global financial technologies, and localized socio-economic mandates. (Agrawal, 2026; Dadasaheb & Bhosale, 2026; Sharma, 2026).

Gap in Localized AI Frameworks: While current literature extensively covers the theoretical applications of Artificial Intelligence in global finance, there is a pronounced scarcity of research focusing on how these sophisticated algorithmic models can be adapted for the low-resource, localized environments typical of PSB rural branches.(IISPPR, 2026; JETIR, 2026). Empirical studies lack robust frameworks evaluating the deployment of AI-driven alternative credit scoring specifically designed for unbanked populations with zero formal credit historycreating a disconnect between high-level policy and grassroots implementation (Reserve Bank of India, 2025 [FREE-AI Report]; NITI Aayog, 2023).

Omission of Procurement and Policy-Driven Inclusion: The literature robustly discusses Micro, Small, and Medium Enterprises (MSMEs) in a broad economic context. However, there is a significant research deficit regarding how Digital Financial Inclusion (DFI) directly enables marginalized micro-enterprises—particularly those led by women—to leverage specific government reservation policies and public procurement quotas.(Agarwal, 2024; Ministry of Micro, Small and Medium Enterprises [MSME], 2025). The mechanisms through which PSBs digitize the operational footprint of these enterprises to facilitate institutional credit and policy compliance remain underexploredin current scholarship (Singh & Malit, 2023; World Bank, 2025).

Algorithmic Bias and Vernacular Interface Design:
Current socio-technical research predominantly utilizes generalized models like the Technology Acceptance Model (TAM) to explain the digital divide.(Kumar & Gupta, 2024).Yet the literature inadequately addresses the specific UI/UX challenges and potential algorithmic biases inherent in PSB digital platforms.(Bello, 2024). There is a critical need for studies examining how non-vernacular interfaces and globally trained algorithms fail to accommodate the cognitive and linguistic realities of India's rural demographic, necessitating a shift toward more inclusive, "responsible" enablement of technology (Agrawal, 2026; Mishra & Rao, 2023).

CONCLUSION AND FUTURE SCOPE

The imperative for Digital Financial Inclusion has transitioned from a supplementary banking service to a core macroeconomic objective, with Indian nationalised banks serving as the primary architects of this inclusion. (Reserve Bank of India, 2025; Sen & Srivastava, 2023). This comprehensive literature review synthesized the current academic discourse, mapping the trajectory of DFI through the lenses of technological architecture, socio-technical barriers, and targeted demographic empowerment. The analysis indicates that while PSBs have successfully deployed foundational digital infrastructure, such as the Unified Payments Interface (UPI) and localized Business Correspondent networks, systemic barriers regarding digital literacy and interface accessibility persist.(Koefer& Preziuso, 2024; Mishra & Rao, 2023).

Furthermore, the review highlights that the academic focus must pivot from broad technological adoption toward the granular application of advanced computational models in driving equitable economic growth.(Sharma, 2026; Agrawal, 2026) The identified gaps in the literature underscore a critical need for localized, empirically grounded research.(MeitY, 2025; IISPPR, 2026)

Future Scope: The findings of this review pave the way for future empirical investigations situated at the intersection of computer management and business strategy.(JETIR, 2026). Subsequent research should focus on developing localized AI frameworks that allow nationalised banks to execute targeted financial inclusion mandates more efficiently.(Reserve Bank of India, 2025 [FREE-AI Report]) Specifically, future studies must empirically measure the impact of AI-driven digital credit delivery on the formalization of marginalized MSMEs and women entrepreneurs, thereby aligning advanced global finance technologies with grass-roots economic empowerment.(Agarwal, 2024; Sharma & Desai, 2025).

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