

The Evolution of Digital Finance in India: Opportunities, Challenges, and Policy Directions Towards Viksit Bharat 2047

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ABSTRACT

Purpose: The rapid proliferation of digital financial services in India has fundamentally reshaped the country's financial ecosystem, accelerated financial inclusion and fostered innovation. The study examines the evolution of digital financial services in India and evaluates how technological innovations, particularly the Unified Payments Interface (UPI), are influencing financial inclusion and broader socio-economic transformation. It aims to understand the opportunities and challenges shaping India's digital finance landscape as the country progresses toward the vision of Viksit Bharat 2047. This paper traces the trajectory of digital finance from foundational reforms to the dominance of the Unified Payments Interface (UPI) and examines the interplay between technological advancement and socio-economic transformation.

Design/Methodology/Approach: The study draws on secondary data from authoritative sources, including the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI). It documents the sector's exponential growth, highlighted by UPI recording 20.7 billion transactions in October 2025. A comprehensive thematic literature review synthesises scholarly insights on innovation, inclusion, regulatory evolution, and emerging risks in digital finance. The analysis explores opportunities in embedded finance, micro-lending, and global digital public infrastructure leadership, while acknowledging persistent challenges such as cybersecurity threats and the rural-urban digital divide. The study also proposes a forward-looking regulatory framework to support innovation, resilience, and equitable access as India moves toward Viksit Bharat 2047.

Findings: The study finds that India's digital financial ecosystem has witnessed unprecedented growth driven primarily by UPI's adoption and rapid technological innovation. Digital finance has significantly enhanced financial inclusion, improved transactional efficiency, and enabled socio-economic participation across diverse population segments. However, the findings also reveal that despite strong progress, critical challenges remain—especially in cybersecurity preparedness, digital literacy, infrastructure gaps, and disparities between rural and urban adoption. The analysis underscores that sustained innovation must be complemented by strong regulatory oversight and inclusive policy mechanisms to ensure equitable digital financial transformation.

Originality/Value: This paper offers a holistic and future-oriented perspective on India's digital finance journey by integrating technological, regulatory, and socio-economic dimensions. Its value lies in tracing the evolution of digital finance from early reforms to UPI-driven dominance, while positioning India's digital public infrastructure as a potential global benchmark. The study contributes original insights into how India can balance innovation with inclusion and resilience, particularly in the context of achieving Viksit Bharat 2047. By outlining strategic priorities for policymakers and stakeholders, it provides a meaningful roadmap for shaping India's next phase of digital financial growth.

Paper Type: Theme Based Paper

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Introduction

The advent of digital financial services in India represents one of the most profound structural transformations in the nation's post-independence economic history. Enabled by the convergence of widespread mobile penetration, robust digital public infrastructure, and progressive regulatory oversight, digital finance has transitioned from a peripheral phenomenon to the cornerstone of India's financial architecture. By the first half of fiscal year 2025–26, digital modes accounted for 99.8% of total transaction volume by count, underscoring the near-complete shift from cash-based to technology-mediated exchange (Reserve Bank of India, 2025a).

This transformation gains added significance when viewed against the backdrop of India's long-term vision of becoming a developed nation by 2047—the centenary of independence—under the *Viksit Bharat* framework. A \$30–40 trillion economy by 2047 will require sustained annual growth exceeding 8%, a target unattainable without leveraging digital finance to enhance productivity, broaden access to credit, and reduce transaction costs across sectors (NITI Aayog, 2024).

The Pradhan Mantri Jan Dhan Yojana (PMJDY), launched in 2014, has created more than 559 million bank accounts, while direct benefit transfers exceeding ₹34 lakh crore have demonstrated the efficacy of the Jan Dhan–Aadhaar–Mobile (JAM) trinity in bypassing intermediaries and reducing leakage (Ministry of Finance, 2025). Yet, this rapid digitisation has also exposed vulnerabilities, evidenced by the doubling of reported cyber fraud cases between 2022 and 2024 (Indian Computer Emergency Response Team, 2025).

Employing secondary data from the RBI, NPCI, and peer-reviewed studies, this paper systematically examines the evolution, opportunities, challenges, and requisite policy trajectories of digital finance in India. The analysis is structured as follows: a thematic literature review, historical evolution, opportunity assessment, challenge identification, empirical insights, policy recommendations, and concluding observations.

Review of Literature

The literature on digital finance in India has expanded considerably since 2016, reflecting both the dynamism of the sector and its implications for economic development. This review organises the literature thematically to identify convergences, divergences, and lacunae.

Historical Evolution and Institutional Foundations

Extant research consistently identifies the 2016 demonetisation episode and the simultaneous launch of the Unified Payments Interface as inflection points (Basu & Datta, 2023; Kumar & Singh, 2024). The India Stack—comprising Aadhaar biometric identity, e-KYC, and UPI—has been characterised as a unique form of digital public infrastructure that has lowered barriers to entry for private innovators while retaining public oversight (Mukherjee, 2024). Longitudinal analyses highlight a 38-fold increase in non-cash transaction volume between 2014 and 2024, with UPI emerging as the dominant rail (Reserve Bank of India, 2025b).

Financial Inclusion and Socio-Economic Impact

A substantial body of work underscores digital finance's role in advancing financial inclusion. Empirical studies demonstrate that PMJDY accounts have significantly increased savings mobilisation among rural and female populations, with female ownership reaching 55% by 2025 (Sharma & Patel, 2024). Researchers further document reduced gender and geographic disparities in access to formal credit following the integration of alternative data in lending algorithms (Garg & Agarwal, 2025). However, scholars caution that inclusion metrics often emphasise account ownership rather than active usage or meaningful welfare gains (Singh & Kaur, 2023).

Innovation Ecosystems and Market Dynamics

The fintech sector's growth trajectory has attracted considerable attention. Projections estimate the market expanding from USD 44.12 billion in 2025 to approximately USD 95–200 billion by 2030, driven by embedded finance, neo-banking, and insurtech (KPMG, 2025; EY India, 2025). Scholars highlight network effects and low marginal costs as key enablers, while also noting concentration risks among a handful of large platforms (Joshi & Reddy, 2024).

Risks, Vulnerabilities, and Regulatory Challenges

Cybersecurity and data privacy dominate risk-related scholarship. With India recording over 22.6 lakh cyber fraud complaints in financial services in 2024, researchers emphasise the urgency of moving beyond perimeter-based security toward Zero Trust architectures (Data Security Council of India, 2025). Algorithmic bias, predatory lending practices, and the urban-rural digital divide constitute recurring concerns (Verma & Gupta, 2025; Thomas, 2024).



Policy and Governance Frameworks

The literature on regulatory framework advocates “principle-based” rather than “rule-based” approaches to foster innovation while preserving stability (RBI, 2025c). The establishment of regulatory sandboxes, the 2023 Digital Personal Data Protection Act, and ongoing deliberations on central bank digital currency (CBDC) are viewed as steps toward a mature governance ecosystem (Nilekani & Shah, 2024).

The literature collectively affirms digital finance’s transformative potential but identifies the need for more longitudinal, disaggregated studies that move beyond aggregate metrics to examine distributional outcomes and systemic resilience.

Evolution of Digital Finance in India

The evolution of digital finance in India may be **periodised into four phases**: pre-2014 foundational developments, 2014–2016 institutional buildup, 2016–2020 accelerated adoption, and 2020–2025 maturation and global outreach.

The **pre-2014 phase** witnessed the rollout of Aadhaar and early mobile banking initiatives. The watershed period began with PMJDY in August 2014, followed by the Payment Banks framework and the Bharat Bill Payment System. The **launch of UPI** in April 2016 marked a paradigm shift by enabling interoperable, real-time, peer-to-peer and peer-to-merchant payments at near-zero cost.

Post-demonetisation momentum, compounded by the COVID-19 pandemic, propelled digital adoption. UPI transaction volumes grew from 1.6 billion in FY 2018–19 to 131 billion in FY 2024–25, reflecting a compound annual growth rate exceeding 80% (National Payments Corporation of India, 2025). Concurrently, fintech entities proliferated, surpassing 10,000 startups by mid-2025 (KPMG, 2025).

The ongoing **maturation phase** is characterised by embedded finance, account aggregators, and the phased introduction of the e-rupee CBDC. Regulatory milestones—including guidelines on digital lending (2022) and peer-to-peer insurance platforms—reflect a shift toward principle-based supervision that balances innovation with consumer protection.

Opportunities

Digital finance presents **four principal opportunities** for India’s development trajectory.

First, **deepening financial inclusion** remains paramount. With 559 million PMJDY accounts and the Financial

Inclusion Index rising to 67 in 2025, digital channels have extended formal finance to previously unbanked populations, particularly women and rural households (Reserve Bank of India, 2025d).

Second, **embedded finance and open banking architectures** enable seamless integration of financial services into non-financial platforms, expanding credit penetration among micro, small, and medium enterprises (MSMEs) and gig workers. The embedded finance market is projected to reach USD 24.03 billion in 2025, growing at 12.4% annually (Business Wire, 2025).

Third, **technological leapfrogging** through artificial intelligence, blockchain, and big-data analytics offers scope for cost reduction and risk management. Alternative credit scoring models have demonstrated potential to increase formal credit access by 20–30% among thin-file borrowers (Garg & Agarwal, 2025).

Fourth, **global leadership** in digital public goods positions India to export its DPI stack, potentially generating significant service exports and soft-power dividends by 2047.

Challenges

Despite remarkable progress, several structural and emerging challenges persist.

Cybersecurity constitutes the foremost risk. The exponential increase in transaction volumes has been accompanied by a surge in fraud, with reported cases rising from 10.29 lakh in 2022 to over 22.68 lakh in 2024 (Ministry of Home Affairs, 2025). Sophisticated social engineering and API vulnerabilities continue to exploit consumer trust.

The **rural-urban digital divide** remains pronounced. Although mobile penetration exceeds 80%, high-speed broadband reaches only 35% of rural households, constraining meaningful engagement with sophisticated financial products (TRAI, 2025).

Regulatory arbitrage, data privacy concerns, and algorithmic opacity pose additional hurdles. The absence of comprehensive legislation governing non-bank lenders until recently contributed to instances of exorbitant interest rates and coercive recovery practices.

Finally, **over-reliance** on a limited number of payment rails raises systemic risk considerations, particularly in the context of potential technological disruptions or coordinated cyberattacks.

Empirical Analysis Using Secondary Data

Secondary data from official sources provide compelling evidence of both achievement and remaining gaps.

Table 1: Key Indicators of Digital Finance Growth (2020–2025)

Indicator	2020	2025(H1)	CAGR(%)
UPI transaction volume (billion)	22.4	125.5	84
UPI transaction value (₹ lakh crore)	41	153.3	72
PMJDY accounts (million)	404	559	7
Financial Inclusion Index	53.9	67.0	-
Reported cyber fraud cases (lakh)	4.3	11.3	174

Sources: NPCI (2025); RBI (2025a); Ministry of Finance (2025)

The data reveals a clear dichotomy: extraordinary expansion in transaction volume coexists with escalating fraud incidence, underscoring the imperative for concomitant investment in security infrastructure.

Policy Directions Toward Viksit Bharat 2047

Achieving the vision of a developed India by 2047 necessitates a forward-looking policy architecture anchored in five pillars:

1. Robust Cybersecurity Framework: Mandatory adoption of Zero Trust architecture, real-time fraud monitoring, and public–private threat intelligence sharing.
2. Universal Digital Infrastructure: Accelerated deployment of rural broadband and digital literacy programmes targeting 100% teledensity and 80% financial literacy by 2035.
3. Innovation-Friendly Regulation: Expansion of regulatory sandboxes, principle-based oversight for emerging technologies, and harmonised data governance under the Digital Personal Data Protection Act.
4. Inclusive Design Imperatives: Gender-disaggregated targets, accessibility standards for persons with disabilities, and incentives for vernacular-language fintech solutions.
5. Global Leadership Strategy: Proactive export of India Stack components, participation in cross-border payment interoperability initiatives, and advocacy for inclusive global standards.

Implementation of these measures, supported by sustained public investment and international collaboration, is essential to translate technological potential into equitable prosperity.

Conclusion

Digital finance has emerged as a pivotal enabler of India's economic transformation, significantly advancing financial inclusion and transactional efficiency. However, realising the Viksit Bharat 2047 vision demands resolute policy action to mitigate cyber risks, bridge digital divides, and maintain an innovation-friendly yet prudent regulatory environment. With strategic foresight and coordinated effort, India is well positioned to establish itself as a global benchmark for inclusive, resilient, and technologically sophisticated financial systems.

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Annexure 17.3.3

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Reviewers Memorandum



Reviewer's Comment 1: The manuscript addresses a highly topical and policy-relevant issue by examining the evolution of digital finance in India within the broader vision of *Viksit Bharat 2047*. The integration of technological, regulatory, and socio-economic perspectives is a notable strength and enhances the paper's practical relevance. To further strengthen the academic contribution, the authors may consider more explicitly articulating how this study advances existing literature beyond descriptive synthesis, particularly by highlighting its unique analytical or policy-oriented insights which provide scope for future studies.

Reviewer Comment 2: The use of authoritative secondary data from institutions such as the RBI and NPCI adds credibility and robustness to the analysis. The thematic organisation of literature and empirical indicators is clear and informative. As a minor improvement, the paper could benefit from briefly clarifying the criteria used for selecting secondary data sources and indicators, which would enhance methodological transparency and strengthen the empirical grounding of the study.

Reviewer Comment 3: The discussion of opportunities and challenges in India's digital finance ecosystem is comprehensive and well-structured. The paper effectively balances optimism regarding innovation with caution around cybersecurity and inclusion gaps. Future studies could link empirical trends and policy recommendations, thereby strengthening the causal logic connecting observed challenges to the proposed policy directions.

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Editorial Excerpt



The article has 1% of plagiarism which is the accepted percentage as per the norms and standards of the journal for publication. As per the editorial board's observations and blind reviewers' remarks the paper had some minor revisions which were communicated on a timely basis to the authors (Sonakshi and Kishan), and accordingly, all the corrections had been incorporated as and when directed and required to do so. The comments related to this manuscript are noticeably related to the theme "**The Evolution of Digital Finance in India: Opportunities, Challenges, and Policy Directions Towards Viksit Bharat 2047**" both subject-wise and research-wise. The manuscript is well-written, clearly structured, and maintains a consistent academic tone throughout. The progression from historical evolution to policy directions is logical and reader-friendly, allowing the arguments to unfold coherently. With minor refinements in paragraph conciseness and smoother transitions, particularly in longer sections the narrative flow can be further strengthened. After comprehensive reviews and editorial board's remarks the manuscript has been categorized and decided to publish under "**Theme Based Paper**" category.

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The acknowledgement section is an essential part of all academic research papers. It provides appropriate recognition to all contributors for their hard work and effort taken while writing a paper. The data presented and analyzed in this paper by (Sonakshi and Kishan) were collected first handily and wherever it has been taken the proper acknowledgment and endorsement depicts. The authors are highly indebted to others who facilitated accomplishing the research. Last but not least, endorse all reviewers and editors of GJEIS in publishing in the present issue.

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