



Digital transformation in public infrastructure: A catalyst for financial inclusion in India

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Abstract

The Financial Inclusion (FI) journey of India is driven by a powerful mix of policy innovation, digital revolution and community outreach. Technology has brought financial services closer to people in last 11 years, especially in rural and remote areas. This growth can be seen in the rising rate of Financial Inclusion Index of Reserve Bank of India (RBI) from 53.9 in March 2021 to 67.0 in March 2025 and contribution of digital economy in national income with 11.74% in 2022–23 to 13.42% by 2024–25. The digital public infrastructure in India has transformed access to financial services. In 2025, PMJDY accounts crossed 55.98 crore and Rs.24.03 lakh crore payments by UPI while poverty rate decline from 29.17% in 2013-14 to 11.28% in 2022-23 in India. From direct transfers to low-cost investments, every step is bringing banking, credit, saving closer to every citizen and builds a secure tomorrow. Even after years of efforts, many people in India are still excluded from formal financial system due to challenges in digital financial inclusion. This study explores financial inclusion, government digital initiatives, their benefits and challenges, and suggests ways to promote safe and inclusive digital finance.

Keywords: Digital transformation, Financial Inclusion, India, JAM, PMJDY, UPI

Introduction

The economic growth of a country depends on bridging the financial gap, achievable through financial inclusion and equal access for all. It supports 7 of the 17 SDGs adopted by the United Nations. RBI defines FI as ensuring affordable and transparent access to financial services for all, especially vulnerable groups. It provides access to credit, savings, insurance, payments, financial literacy, and consumer protection, supporting business growth, entrepreneurship, women's empowerment, and risk management. It strengthens economic activity, productivity, and growth. In India, with its vast and diverse population, financial inclusion is vital to integrate marginalized groups, reduce reliance on informal lenders, bridge the rural-urban divide, improve low-income household stability, and deliver government benefits efficiently through digital platforms.

To promote infrastructure development and uplift marginalized communities, the Indian government has implemented several initiatives over the years, including bank nationalization (1969), Priority Sector Lending Banks (1971), Regional Rural Banks (1975), NABARD (1982), SHG-Bank Linkage programs (1992), NABARD's one million SHG goal (1998–2005), SIDBI microcredit foundation (2000), "no-frills" accounts (2005), Rangarajan Committee recommendations (2008), and Business Correspondent model with simplified KYC (2010–2014). Despite these efforts, benefits often failed to reach poor people. The reason behind this failure is corruption and system leakages.

To reduce leakages, the Pradhan Mantri Jan Dhan Yojana (PMJDY) was launched by government on 28 August 2014. Its objective was to enable direct benefit transfers and driving massive account openings. To achieve this, the government pursued digitalization. Now PMJDY is the largest financial inclusion program in world. Combined with the JAM Trinity, it ensures direct transfer of funds from the central government to beneficiaries. It is also connecting the marginalized populations to India's growing economy. The Indian government introduced two strategies—National Strategy for Financial Inclusion (NSFI) 2019–2024 and National Strategy also for Financial Education (NSFE) 2020–2025. Both strategies aim to promote banking for all, financial literacy, and consumer protection, achieving key milestones by mid-2025.

To monitor global financial access, the World Bank publishes the Global Findex Database. India also introduced its Financial Inclusion Index (FI-Index) in 2021 to track policy progress and promote universal access to finance. The FI-Index ranges from 0 (no inclusion) to 100 (full inclusion) and comprises three sub-indices—Access (35%), Usage (45%), and Quality (20%). Growth has been observed across all three sub-indices alongside the overall rise in the index. The FI-Index of RBI has reached to 67 in March 2025 from 64.2 in March 2024. This rise in index indicates the comprehensive growth in financial access, usage, and quality. As per Global Findex 2025, the account ownership has reached to 89% in India since 2011 which indicates the strengthening of FI and financial literacy initiatives in India. It is also highlighting the

continuous dedication of government of India to include every citizen of country in growing digital financial infrastructure. The country has also made progress in share of adults with active accounts. Their main focus is to provide empowerment and opportunity to everyone.

Objectives of the study

- To study the concept of financial and digital financial inclusion.
- To outline major initiatives driving digital financial transformation.
- To assess the benefits of digital financial inclusion in India.
- To identify key challenges in India’s digital transformation.
- To recommend measures for inclusive, secure, and sustainable digital finance.

Review of literature

Researchers have highlighted the critical role of FI and digital finance in promoting economic growth and reducing inequality. Rosella Care *et al.* (2025) emphasized blockchain and mobile money for improving access, lowering transaction costs, and enhancing transparency. Deepak Mishra *et al.* (2024) stressed providing financial access to underserved populations through campaigns and credit reforms. Frank Antwi *et al.* (2024) [1] noted that FI alone has limited impact on stability, requiring strategic investments. Gautam Kumar Biswas (2023) [8] reported positive effects on economic growth, urging policymakers to accelerate inclusion efforts. Saha Sumanta Kumar and Qin Jie (2023) highlighted benefits for women, the poor, and school enrollment in reducing poverty and inequality. Chuka Ifediora *et al.* (2022) [6] found mixed effects of banking infrastructure and mobile money on growth. Driss Tsouli (2022) [15] observed that population density, GNI, inflation, and internet use significantly influence FI and help reduce income inequality in Europe. Jain Dr. Jatan Kanwar (2016) argued that equitable distribution of financial inclusion is key for inclusive growth. Thorsten Beck (2016) [2] concluded that financial deepening supports structural transformation and poverty alleviation in developing countries.

Research methodology

The present study is descriptive in nature and relies on secondary data. Data is collected from various official sources such as reports on RBI and PMJDY websites, Ministry of Financial Services annual reports, World Bank reports,

government press releases (PIB). Data is also taken from verified media outlets like Economic Times and Indian Express. Also, various research articles from journals including the International Journal of Research and Analytical Reviews (IJRAR) and the Journal of Risk and Financial Management (JRFM) are used by the researcher for study purpose.

Concept of digital financial inclusion

Digital financial inclusion (DFI) uses cost-effective digital tools which provide formal financial services to underserved populations. It also ensures affordability for users and sustainability for providers. Banks and non-banking institutions are leveraging mobile phones and digital platforms to offer payments, transfers, savings, credit, and insurance, enabling millions to move from cash-based to formal financial transactions. In India, initiatives like the Jan Dhan Yojana, UPI, and Aadhaar-enabled payments have transformed financial access over the past decade, making it widely available and promoting self-reliance. This is especially important for the 60% of the population reliant on agriculture and the informal sector. The government’s focus on efficient public spending, technology access, and empowering disadvantaged groups, combined with the JAM framework, ensures direct, transparent transfers while minimizing leakages and corruption.

Key initiatives powering digital transformation for financial inclusion in India

Digital transformation has expanded financial access for marginalized groups, with the RBI and GOI driving initiatives in rural and remote areas. Key initiatives of digital transformation are as follows:-

- **Provision of Urban Amenities in Rural Areas (PURA)**

This model was envisioned by Dr. A.P.J. Abdul Kalam in January 2003 to promote holistic rural development by integrating four connectivities namely Physical connectivity (roads, power, housing), Electronic connectivity (internet, mobile, telecom), Knowledge connectivity (schools, skills, vocational training) and Economic connectivity (livelihoods, MSMEs, digital finance). Financial inclusion was considered a cornerstone of this strategy. The Ministry of Rural Development launched PURA scheme on a pilot basis (2004–07) to ensure direct benefits to rural communities and reduce leakages. It was later relaunched during the Eleventh Five-Year Plan with support from the Asian Development Bank and implemented through a Public-Private Partnership (PPP) model involving gram panchayats and private partners.

Table 1: Major achievements of PMJDY from March 2015 to January 2025 (Accounts in crore) (Amount in Rs. Crore)

Year (end march)	Total accounts	No. of Accounts		No. of Accounts		Amount deposited in accounts
		Male	Female	Rural/Semi-urban	Urban/Metro	
2015	14.72	7.15	7.39	8.68	5.86	14,641
2016	21.43	10.37	11.05	13.17	8.26	35,672
2017	28.17	13.67	14.49	16.87	11.30	62,972
2018	31.44	14.85	16.60	18.52	12.92	78,494
2019	35.27	16.53	18.74	20.90	14.37	96,107

2020	38.33	17.85	20.48	22.63	15.70	1,18,434
2021	42.20	18.82	23.38	27.85	14.35	1,45,551
2022	45.06	19.98	25.08	30.07	14.99	1,66,459
2023	48.65	21.60	27.05	32.45	16.20	1,98,844
2024	51.95	23.05	28.90	34.58	17.36	2,32,502
2025*	54.50	24.17	30.33	36.28	18.22	2,44,381

Source: Annual Report 2024-25, Ministry of Financial Services

Pradhan Mantri Jan Dhan Yojana (PMJDY)

Under PMJDY, beneficiaries are offered a basic savings bank account with no minimum balance requirement, accident insurance coverage of Rs.1lakh, a RuPay debit card and an overdraft facility of upto Rs.10,000 for eligible account holders. As per table-1, a total of 54.50 crore accounts have been opened under PMJDY as of 08.01.2025. These accounts have a deposit balance of Rs.2,44,381 crore, up from 14.72 crore accounts holding Rs.14,641 crore in March 2015. Women now hold 30.33 crore accounts (55.7%) and men 24.17 crore (44.3%). Out of which, 36.28 crore (66.6%) accounts are in rural and semi-urban areas and 18.22 crore (33.4%) in urban centers. Around 37.23 crore RuPay cards have been issued, each providing accident insurance (Rs.2 lakh, Rs.1 lakh for accounts opened before 28 August 2018). About 88.6% of active accounts are Aadhaar-linked. These accounts are enabling seamless transactions and Direct Benefit Transfers via the Aadhaar Payment Bridge. These figures are demonstrating the success of this scheme.

Aadhaar and e-KYC

The Aadhaar-based e-KYC system has simplified identity verification in banking. It has improved the public services by reducing paperwork, speeding up processes and improving transparency. By April 2025, about 141.88 crore Aadhaar numbers had been issued. This growth has made Aadhaar a key pillar of digital infrastructure and service delivery system in India.

Direct benefits transfer (A cleaner welfare system)

Supported by Aadhaar authentication, DBT has improved the delivery of subsidies and welfare benefits by transferring funds directly to beneficiaries' bank accounts. Between 2015 and March 2023, it helped save over Rs.3.48 lakh crore by removing fake beneficiaries. By May 2025, total DBT transfers had crossed Rs.44 lakh crore, along with the removal of crores of ineligible ration cards and duplicate LPG connections, ensuring benefits reach the rightful recipients.

JAM trinity

It has driven digital revolution of nation and enhance transparency within the financial ecosystem. DBT uses this JAM network for instant Direct Benefits transfer under various Government Schemes, subsidies like LPG, pensions, and scholarships, and payments directly into beneficiaries' bank accounts. Jan Dhan accounts receive the funds and Aadhaar ensures the right person gets it. Mobile notifies and enables easy access to money. As on 14th August 2025, over Rs.45.70 lakh Cr has been directly transferred to beneficiaries.

Unified Payments Interface (UPI)

To enable instant digital payments by linking multiple bank accounts to a single mobile app, the National Payments Corporation of India (NPCI) has launched UPI in 2016. Table-2 indicates that the transaction value increased from Rs.5.47 lakh crore in June 2021 to Rs.24.03 lakh crore in June 2025, while volume rose from 280 crore to 1,839 crore transactions. With around 460 million users and 65 million merchants, and operations in several countries, UPI has positioned India as a global leader in real-time digital payments.

Table 2: UPI transactions value and growth in volume from June 2021 to June 2025 in India

Year	UPI transactions value over the years (in Rs. Lakh Crore)	Growth in UPI transactions volume (in Crore)
June 2021	5.47	280
June 2022	10.14	586
June 2023	14.75	933
June 2024	20.07	1388
June 2025	24.03	1839

Source: <https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154912&ModuleId=3>

Banking touch points: To strengthen financial inclusion, the number of bank branches, ATMs, and card acceptance devices has steadily increased. The Point of Sale (POS) terminals rose from 51.86 lakh in March 2020 to 96.91 lakh in November 2024, improving digital payment access across regions.

Jan Dhan Darshak (JDD) app: It was developed in 2018 by the Department of Financial Services and the National Informatics Centre. It helps citizens locate nearby banking

facilities such as branches, Bank Mitras, ATMs, and post offices. As of December 2024, it mapped 1.77 lakh branches, 14.68 lakh Business Correspondents (including 1.64 lakh IPPB-BCs), and 2.11 lakh ATMs. Nearly 99.91% of mapped villages have a banking outlet within a 5 km radius.

Digital Banking Units (DBUs): On 16 October 2022, 24 banks established 75 DBUs across 75 districts nationwide to promote digital banking. These units assist customers

especially those less familiar with technology through self-service and assisted modes. They also support enrollment in government credit-linked schemes via the Jan Samarth portal and facilitate end-to-end digital loan processing. By December 2024, 107 DBUs had recorded over 1.80 crore customer interactions.

The government of India (GOI) has also launched numerous initiatives to promote digital FI and provide banking services across the country, including remote areas. Key programs include Kisan Credit Card (KCC), ONDC, GeM, Karmayogi Bharat, DigiLocker, UMANG, PMGDISHA, TFIIP, Mission Utkarsh, Pradhan Mantri Suraksha Bima Yojana (PMSBY), Pradhan Mantri Jeevan Bima Yojana (PMJBM), Atal Pension Yojana (APY), PM MUDRA Yojana, Tarun Plus, Stand Up India, Mahila Samridhi Yojana, PM Vishwakarma Scheme, PM Svanidhi, nationwide financial literacy campaigns, CHOTI SIP, and Bank Mitras.

Benefits of digital financial inclusion in India

Around 2.5 billion adults depend solely on cash because they lack access to formal financial services. DFI can significantly improve their financial participation.

- **Access to formal financial services:** Account based services such as transfers, payments, savings, insurance, credit, securities, etc. are expanding over time just because customers gain familiarity and trust in digital transactional platform and also providing a path for the financially excluded into the financial system.
- **Efficient and transparent benefit transfers (DBT):** The PMJDY accounts plus Aadhaar enabled authentication made DBT scale-up feasible. Reduction in leakage, delays, and dependency on intermediaries is become possible due to Direct Benefit Transfer (DBT) into bank accounts. Now the effective income is timely reaching to poor households and DBT into women's accounts enhances control over spending and savings.
- **Resilience and consumption smoothing:** Digital financial inclusion provides access to formal savings, microinsurance, and remittance channels. It helps households to manage shocks (health, crop failure). It is also reducing the likelihood of distress sales that entrench poverty. No-frills accounts + DBT via Aadhaar rails improve timeliness/accuracy of transfers, stabilizing shocks.
- **Helpful for micro-enterprise:** Seamless QR acceptance and instant settlement improves working-capital cycles for nano-MSMEs and street vendors. The near-billion internet subscriber base enables home-based and street-level enterprises to accept digital payments and sell online; this is especially salient in rural India where user growth is strongest.
- **Transactional history enables access to credit & savings:** Regular digital inflows/outflows in bank accounts create a verifiable transaction history like UPI receipts, GST e-invoices. This can be helpful for banks/fintechs to extend small-term loans, microcredit, tailored savings products and microenterprise investment. Also the account ownership combined with push notifications, e-statements, and mobile interfaces can nudge savings and budgeting behaviours of customers.

- **Lower transaction costs and market access:** UPI/AEPS reduce cash-handling and remittance costs, raising disposable income and enabling micro-savings. e-KYC slashes, onboarding time and expense encouraging formal uptake by first-time users. It also allows customers to transact locally in irregular, tiny amounts, helping them to manage their characteristically uneven income and expenses.
- **Reduction in risk and inclusion errors:** It has reduced the risks of loss, theft, and other financial crimes posed by cash-based transactions. Also the Digital ID + account rails reduce inclusion/exclusion errors in welfare, freeing fiscal space for pro-poor outlays.

Key challenges for digital transformation in India

Digital financial inclusion, while offering many benefits, also poses risks to the vulnerable and underserved populations it aims to help. Major challenges include:

- **Cybersecurity and fraud risks:** Digital systems face phishing, SIM swap frauds, increased sophistication in online scams targeting rural users and weak consumer protections. High rates of SIM deactivation or change among low-income populations disrupt digital authentication flows (Aadhaar/OTP), causing payment failures and exclusion.
- **Network and infrastructure gaps:** Rural connectivity issues persist with many villages. Many poor households are facing lack of smartphones, reliable internet or even basic feature phone coverage. SMS and app-based services can fail to reach them reliably. Also the connectivity gaps create barriers to regular use.
- **Lack of financial literacy and behavioral constraints:** Opening an account by the customer does not imply familiarity with saving, budgeting or digital payments. Low levels of digital and financial literacy discourage people from using apps, understanding transaction costs, or trusting digital channels for savings and payments.
- **Gender gaps:** Lower digital access and smartphone ownership can be seen among women in many regions which affects women's participation in financial inclusion.
- **Agent network and last-mile service quality:** The service of Business correspondents or agents is uneven in remote areas which undermines reliability for cash-in/cash-out services. Informal credit mechanisms remain significant and some households prefer cash for cultural or trust reasons.
- **Interoperability, KYC, and Re-KYC Bottlenecks:** Regulatory requirements, re-KYC cycles and identity mismatches create barriers to service continuity in banks.
- **Design, trust and awareness deficits:** Poor user interface design, lack of human support or poorly designed grievance redressal channels reduce adoption and create distrust among low-literate users. Also, many users are unaware of the benefits and protections of digital banking.
- **Inoperative accounts:** Many accounts remain inoperative due to lack of deposits, limited transactions, or issues with KYC and service access. It has reduce the program's effectiveness of PMJDY accounts because idle accounts do not build savings, nor are they actively used for transfers/credit.

Conclusion and Suggestions

Digital transformation in India has strengthened financial inclusion by lowering costs, improving DBT delivery, enabling credit access, and connecting small businesses to wider markets. The PMJDY and JAM Trinity have expanded banking access, increased transparency, and reduced corruption. However, technology must be supported by better infrastructure, financial literacy, gender inclusion, and strong governance, especially in remote areas. Some suggestions for effective digital transformation for financial inclusion in remote areas are as follows:

- **Protection of vulnerable user:** There is need to shift emphasis from account-opening counts to active usage metrics, incentivize recurring use, default risk warnings in UPI apps, strong recourse norms, real-time scam interdiction and progressive rollout of optional biometric authentication with clear safeguards.
- **Invest in last-mile digital infrastructure:** Affordable access to digital devices and invest in rural broadband, last-mile electricity, telecom towers, and data connectivity in remote regions should be encouraged by the government in India.
- **Financial and digital literacy:** The government should focus on large-scale context-sensitive financial and digital literacy campaigns through schools, panchayats, and mobile van training to convert dormant accounts to active users.
- **Consumer protection and risk management:** There is need to strengthen grievance redressal, fraud monitoring, and privacy frameworks for protection of consumer.
- **Product designing for poor:** The government should encourage banks to co-design savings, microinsurance, and small-term credit for cyclical incomes like agriculture, daily wages etc. It will not only boost short-term income but also help in poverty reduction.
- **Encourage women-centric financial tools:** There is need for subsidize smartphones for SHGs, mandate gender-disaggregated reporting for UPI & PMJDY usage, apps in local languages, SHG-linked credit, expand branch networks for females, and female agents in bank branches.
- **Foster FinTech-PURA partnerships:** The integration of PURA's rural development vision with digital financial tools can lead India closer to the goal of inclusive and equitable growth. There is need to incentivize digital innovations tailored to rural and tribal India.
- **Over-reliance on digital rails:** Outages or cyber incidents can disrupt critical transfers. So offline and assisted modes in banks should be considered as per requirement of customer.

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