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Digital Finance for All: Mobile Banking's Role in Advancing Financial Inclusion

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Abstract

Financial inclusion is a national priority in India, aimed at integrating unbanked and underbanked populations into the formal financial system to address socio-economic disparities. This paper examines the pivotal role of mobile banking in advancing financial inclusion across diverse socio-economic and geographic segments, with a focus on urban areas like Chennai. Leveraging widespread mobile phone adoption, mobile banking offers a cost-effective and accessible solution for reaching rural and underserved communities. This study employs a theoretical framework combining the Technology Acceptance Model (TAM), Diffusion of Innovation (DOI) theory and Theory of Planned Behaviour (TPB) to analyse adoption patterns. Key opportunities include ease of access, cost efficiency, and government initiatives like Jan Dhan Yojana, driving over 2.19 billion digital transactions in 2024–25. Challenges such as digital illiteracy, cybersecurity risks, and infrastructural gaps persist, exacerbating the digital divide. Global and rural perspectives highlight mobile banking's technical and socio-economic benefits, alongside barriers like low banking penetration and regulatory hurdles. By synthesizing recent literature, policy developments, and case studies, this paper proposes a conceptual framework to guide policymakers, financial institutions, and technology developers in promoting inclusive growth. The findings emphasize collaborative strategies, including digital literacy campaigns and infrastructure investments, to ensure equitable access to financial services in India's digital economy.

Keywords: Mobile banking, financial inclusion, Diffusion of Innovation theory (DOI), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB)



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Introduction

Financial inclusion is a cornerstone of economic development and social equity, enabling underserved and unbanked populations to access formal financial services. In India, mobile banking has emerged as a transformative tool to bridge the financial divide, leveraging the fact that over half of the unbanked population owns mobile phones (Ingale, 2024). The rapid proliferation of mobile technology challenges traditional barriers like geographic limitations, inadequate infrastructure, and high transaction costs (Demirgüç-Kunt et al., 2020). India's digital finance ecosystem has grown significantly, driven by initiatives like Digital India and Jan Dhan Yojana, with payment systems recording a 34.8% increase in transaction volume in 2024–25 (Reserve Bank of India, 2025). However, challenges such as digital illiteracy and unequal access to connectivity persist, particularly in urban areas like Chennai, where the digital divide remains a barrier (Mookerjee et al., 2025).

This study analyses the impact of digital barriers on mobile banking adoption in India, focusing on Chennai, and explores how mobile banking can advance financial inclusion. It adopts a theoretical framework integrating the Technology Acceptance Model (TAM; Davis, 1989), Diffusion of Innovation (DOI) theory (Rogers, 1962), and Theory of Planned Behaviour (TPB; Ajzen, 1991) to examine adoption patterns. The paper identifies opportunities, such as accessibility and cost efficiency, and challenges, including cybersecurity risks and regulatory hurdles, offering a conceptual framework for stakeholders to promote inclusive growth.

Review of Literature

The literature underscores mobile banking's role in reducing financial exclusion, particularly in developing economies.

Sukumaran S. (2025) highlighted mobile banking's technical features, socio-economic benefits, and ethical considerations in enhancing global financial inclusion among marginalized populations. Ingale (2024) emphasizes mobile banking as an accelerator for financial inclusion in emerging economies, noting that over half of India's unbanked population owns mobile phones,



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enabling affordable and accessible financial services. Ingale identifies key adoption indicators, including access to mobile phones, reliable internet, digital literacy, regulatory support, and trust in security systems. Siddik et al. (2014) found that perceived financial cost, risk, and subjective norms significantly influence mobile banking adoption in Bangladesh, with high costs and security concerns as barriers and peer encouragement as a motivator. These findings may apply to India's urban contexts, like Chennai, though local factors like the digital divide require further exploration.

Methodology

This study adopts a qualitative approach, synthesizing peer-reviewed literature, policy documents, and case studies to develop a conceptual framework for mobile banking's role in financial inclusion. Data sources include reports from the Reserve Bank of India (2025), global studies (Demirgüç-Kunt et al., 2020; Sukumaran, 2025), and India-specific research (Ingale, 2024; Mookerjee et al., 2025). The analysis focuses on Chennai to contextualize urban challenges while drawing parallels with rural adoption patterns. The theoretical framework integrates TAM, DOI, and TPB to assess drivers and barriers. Limitations include the reliance on secondary data, suggesting a need for future empirical studies in Chennai.

Opportunities for Financial Inclusion through Mobile Banking:

Ease of Access: Mobile banking enhances financial inclusion by providing unparalleled ease of access, particularly for remote and underserved populations. The widespread ownership of mobile phones enables transactions like money transfers and bill payments without physical bank visits, overcoming geographic barriers (Demirgüç-Kunt et al., 2020; Ingale, 2024). User-friendly applications and SMS-based banking cater to varying technological proficiency levels. Government initiatives like Digital India have strengthened digital infrastructure, integrating mobile platforms with national payment systems for seamless transactions (Reserve Bank of India, 2025). This accessibility is critical for reaching unbanked populations, fostering inclusion.



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Cost Efficiency and Time-Saving Features: Mobile banking reduces transaction costs, making financial services affordable for low-income groups. Unlike traditional banking, mobile platforms offer low-cost or free transactions, aligning with the needs of underserved communities (Demirgüç-Kunt et al., 2020). Time-saving features, such as instant transfers and 24/7 access, enhance appeal, particularly for rural users facing time constraints (Mookerjee et al., 2025).

Government Initiatives: Initiatives like Jan Dhan Yojana and Digital India have accelerated adoption by linking accounts to mobile platforms and promoting digital literacy (Reserve Bank of India, 2025). These programs have driven over 2.19 billion digital transactions in 2024–25, reflecting their impact on financial inclusion.

Low Bandwidth and Offline Functionality: Mobile banking apps designed for low bandwidth and offline capabilities ensure uninterrupted service in areas with poor internet connectivity. Features facilitating offline transactions, such as cached data or SMS-based services, allow users to perform essential banking tasks without constant internet access (Sukumaran, 2025). These capabilities are vital for maintaining financial services in isolated or underserved areas, enhancing inclusion for populations facing connectivity challenges (Mookerjee et al., 2025).

Agent Banking Integration: Agent banking bridges isolated communities and formal financial services by leveraging local agents for account inquiries, withdrawals, and deposits. Integrating features that help users locate and interact with agents enhances convenience and trust, improving the model's efficacy (Ingale, 2024). By collaborating with local agents, financial institutions expand their reach, particularly in rural areas, supporting financial inclusion (Mookerjee et al., 2025).

Microfinance and Loan Accessibility: Mobile banking apps offering micro-lending services support small and medium enterprises (SMEs) and individual entrepreneurs. AI-based credit scoring models, leveraging alternative data like utility bills or mobile usage, enable inclusive creditworthiness assessments for those without traditional credit histories (Sukumaran, 2025). This fosters economic development by extending credit at the grassroots level, empowering underserved populations (Demirgüç-Kunt et al., 2020).



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Embedded Educational Resources: Financial literacy is critical for inclusion. Mobile apps with embedded educational resources, such as interactive tutorials, FAQs, and tailored financial guidance, equip users to make informed economic decisions (Ingale, 2024). These tools help users manage finances, understand savings and investments, and navigate the app, enhancing adoption and empowerment (Sukumaran, 2025).

Challenges and Obstacles for Financial Inclusion through Mobile Banking:

Digital Illiteracy: Digital illiteracy remains a significant barrier to mobile banking adoption, particularly among older and less educated populations. Limited familiarity with smartphones and digital interfaces hinders usage, especially in rural areas where educational resources are scarce (Mookerjee et al., 2025). Addressing this requires targeted digital literacy programs to equip users with the skills needed to navigate mobile banking platforms effectively (Ingale, 2024).
Lack of Trust and Cybersecurity Risks: Lack of trust, driven by concerns over cybersecurity risks, discourages mobile banking adoption. Perceived vulnerabilities, such as data breaches or fraud, undermine user confidence, particularly in regions with low financial literacy (Siddik et al., 2014; Ingale, 2024). Robust security measures, transparent communication, and user education are essential to build trust and mitigate these risks (Sukumaran, 2025).

Infrastructural Gaps: Inadequate infrastructure, such as unreliable internet connectivity and limited access to smartphones, exacerbates the digital divide, particularly in rural and remote areas. These gaps restrict access to mobile banking services, limiting their reach and effectiveness (Mookerjee et al., 2025). Investments in digital infrastructure, including affordable devices and network expansion, are critical to overcoming this barrier (Ingale, 2024).

Regulatory Hurdles: Regulatory challenges, including compliance with data protection and financial regulations, pose significant obstacles. Complex or inconsistent policies can hinder the development and scalability of mobile banking platforms, particularly for smaller financial institutions (Sukumaran, 2025). A supportive regulatory environment with clear guidelines is necessary to foster innovation and ensure user protection (Ingale, 2024).



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Real-World Case Studies: This section presents real-world case studies from India that demonstrate the practical impact of mobile banking on financial inclusion. These examples illustrate how initiatives like PMJDY, UPI, and IMPS have driven adoption and empowered underserved populations.

Pradhan Mantri Jan Dhan Yojana (PMJDY): Launched in 2014, PMJDY aimed to provide bank accounts to every household, integrating digital public infrastructure for financial inclusion. It facilitated COVID-19 relief payments to over 200 million beneficiaries, opening 42 million new accounts, with 25 million for women. Account ownership doubled from 35% to 78%, with 500 million accounts opened and deposits exceeding Rs 2 lakh crore by 2023. Partnerships with banks like Indian Bank encouraged active use through overdrafts and insurance, increasing savings among women (50% saved for children's future) (Roy, 2024). Lessons include the value of government-private collaboration and targeting women to reduce gender disparities.

Unified Payments Interface (UPI): Introduced in 2016, UPI links multiple bank accounts to a single mobile app, enabling real-time transfers and merchant payments. It supports aliases like UPI IDs and features QR codes, USSD for feature phones, and low/no fees. Adoption grew over 100% YoY, with 12,519 million transactions in 2019-20 (75% under INR 1,000). It enhanced inclusion for unbanked via easy registration and agent networks, boosted by demonetization and incentives like BHIM app. Impacts include remittances for migrants and access in rural areas (Gupta & Singh, 2020; Reserve Bank of India, 2020). Outcomes show UPI's role in shifting from cash to digital, promoting a 'less-cash' economy.

Immediate Payment Service (IMPS): Launched in 2010, IMPS provides 24/7 real-time inter-bank transfers, initially mobile-focused. It uses aliases like mobile numbers and supports PPIs with relaxed KYC for unbanked. Volumes grew from 78 million (2014-15) to 2,579 million (2019-20), aiding remittances and bulk payments. It reached digitally excluded via agents, aligning with RBI's inclusion goals (Gupta & Singh, 2020). Lessons highlight overcoming initial registration barriers through innovations like USSD. These case studies validate the theoretical framework, showing how mobile banking drives inclusion when supported by policy and technology.



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Discussion:

Mobile banking's potential to advance financial inclusion is evident through its accessibility, offline functionality, agent banking, microfinance, and educational resources. The case studies of PMJDY, UPI, and IMPS demonstrate significant impacts, such as increased account ownership and transaction volumes, particularly among women and rural populations. However, challenges like digital illiteracy, cybersecurity risks, infrastructural gaps, and regulatory hurdles underscore the need for targeted interventions, particularly in urban areas like Chennai and rural regions. The integration of TAM, DOI, and TPB aligns with global evidence, emphasizing ease of use, relative advantage, and trust as adoption drivers. Collaborative efforts among governments, financial institutions, and technology providers are essential to overcome barriers. Future research should empirically test these models in India to explore urban-rural differences.

Conclusion and Recommendations:

Mobile banking is a powerful tool for financial inclusion in India, bridging geographic and economic barriers through innovative features. Policymakers should prioritize digital literacy campaigns and infrastructure investments to address the digital divide. Financial institutions must enhance cybersecurity and integrate agent banking to build trust. Technology developers should focus on offline capabilities and user-friendly interfaces with educational resources. Future studies should conduct empirical research in Chennai to validate the framework and assess long-term impacts.

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INDEXED IN INDEX COPERNICUS - ICI Journals Master List 2022 - IJCRAR--ICV 2022: 81.15



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