



Evolution of Digital Banking Transactions in India: A Step toward Digital Currency

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ABSTRACT

This paper covers the historical growth of digital banking in India and its significance as a predecessor for the establishment of a Central Bank Digital Currency (CBDC), the digital rupee (₹). The study uses a qualitative review of secondary data to trace the paradigm shift from traditional banking to a digital ecosystem, which was facilitated by key innovations such as Core Banking Solutions (CBS), RTGS, NEFT, and the transformative Unified Payments Interface (UPI), all of which improved financial inclusion, reduced transaction costs, and increased transparency. The analysis acknowledges the potential of the RBI's ₹ to offer a sovereign, efficient, and secure digital currency. However, it also identifies persistent challenges from the digital banking era, such as rural accessibility, cybersecurity threats, and financial literacy gaps, that must be addressed to ensure equitable and successful adoption of CBDCs in India.

Introduction

The Indian banking sector has undergone a paradigm shift over the past few decades, evolving from traditional brick-and-mortar banking services to a highly digitalized financial ecosystem. This transformation has been significantly propelled by advancements in information and communication technologies, policy support, and growing consumer acceptance of digital platforms. From the introduction of Electronic Funds Transfer (EFT) systems and Automated Teller Machines (ATMs) to the



advent of internet banking, mobile banking, and the revolutionary Unified Payments Interface (UPI), India has embraced digitization with remarkable speed and scale (Harshvardhan Govind et al., 2024; P, 2019).

The transition toward digital banking in India is not just about improving convenience and speed. It also represents a structural transformation aimed at enhancing financial inclusion, reducing transaction costs, increasing transparency, and promoting a less-cash economy. Initiatives such as Real-Time Gross Settlement (RTGS), National Electronic Funds Transfer (NEFT), Immediate Payment Service (IMPS), and UPI have made banking services more accessible, especially in remote and underserved regions (Concept Note on Central Bank Digital Currency FinTech Department Reserve Bank of India, 2022; Haque & Shoaib, 2023a).

As the next evolutionary step, Central Bank Digital Currency (CBDC)—particularly India's digital rupee or e₹—emerges as a pivotal innovation. The Reserve Bank of India (RBI) launched pilot projects for e₹ in December 2022, recognizing its potential to serve as a sovereign digital alternative to cash, improve payment efficiency, and counter the volatility and risks associated with private cryptocurrencies (Concept Note on Central Bank Digital Currency FinTech Department Reserve Bank of India, 2022; Haque & Shoaib, 2023a). The e₹ is intended to operate alongside existing forms of money while ensuring the trust, security, and finality that central bank money guarantees (Ceylan, 2024a; Ghosh & Das, 2024).

Moreover, studies emphasize that digital currency may redefine the relationship between individuals, commercial banks, and central monetary authorities. It can foster real-time monetary transactions, enhance policy transmission mechanisms, and offer significant macroeconomic benefits, including improved liquidity management and reduced dependency on physical cash (Ghosh & Das, 2024; Jović et al., 2019).

However, the journey toward full-scale digital currency adoption involves critical challenges such as technological readiness, financial literacy, data security, and ensuring equitable access—particularly in rural and semi-urban areas (Cnaan et al., 2023; Harshvardhan Govind et al., 2024). Therefore, understanding the historical evolution of digital banking in India provides crucial context for examining the feasibility, impact, and future prospects of CBDCs.



Methodology

This study is based on secondary data sources including RBI reports, scholarly articles, and government publications. A qualitative review method has been used to track the historical development of digital banking and assess the potential role of Central Bank Digital Currency (CBDC) in India.

Objectives of the study

1. To examine the historical evolution of digital banking transactions in India and identify significant milestones in digital transformation.
2. To investigate the future prospects of digital currency in India, including its possible impact on banking transactions.

Review of literature

The popularity of digital banking in India has provided the framework for the shift to digital currency, particularly through advancements in platforms like RTGS, NEFT, IMPS, and UPI, which have boosted the speed, security, and accessibility of transactions (Haque & Shoaib, 2023b). The Reserve Bank of India (RBI) has acknowledged these trends and proposed the e-Rupee—a Central Bank Digital Currency (CBDC)—as a digital form of legal tender with the goal of decreasing physical currency handling expenses, promoting financial inclusion, and enhancing payment systems (RBI, 2022). (Ceylan, 2024b) points out the worldwide momentum behind CBDCs and highlights their benefits, such as enhanced payment efficiency and financial access, yet he warns about hazards such as banking sector disruption. (Ghosh & Das, 2024) A bibliometric analysis revealed that CBDC research is still emerging, with minimal exploration of its financial and regulatory elements, emphasizing the need for more focused studies. Meanwhile, (Gupta et al., 2023) demonstrate how India's robust digital payment infrastructure in urban areas, led by UPI, has promoted readiness for digital currency adoption. However, questions about technology accessibility and inclusivity remain important. Studies such as that of (Cnaan et al., 2023) demonstrate that rural India still confronts considerable challenges to digital banking, mostly due to a lack of financial and digital knowledge, posing equity concerns in the transition to a cashless society. Similarly, Revathi (2019) and (Sardana & Singhania, 2018) highlight that while digital banking has improved service delivery and operational efficiency, infrastructural and cybersecurity challenges persist. (Jović et al., 2019) also highlight the regulatory consequences of CBDC adoption, warning that central banks may become direct competitors with traditional banks. Together, these studies highlight that the expansion of digital banking in India not only marks a shift toward digital money, but also requires



deliberate, inclusive, and safe implementation to ensure that the advantages of this change are widely distributed.

The evolution of Digital Banking in India

Banking in India has evolved significantly. From manually updating passbooks to checking balances on mobile apps, from queuing for bill payments to automatic debiting through BBPS (Banking Quest, 2025). we've come a long way to push toward digital finance and the rise of digital currency (e₹).

The Indian banking sector has undergone several phases of transformation, each marked by the adoption of technological innovations to improve service delivery and reach. The evolution of digital banking in India can be broadly divided into the following phases:

Phase	Period	Key Features	Major Revolutions / Milestones
Pre-Digital Phase	1947 – 1990	<ul style="list-style-type: none"> ✓ Dominated by public sector banks ✓ Manual bookkeeping and ledgers ✓ Limited technology use 	<ul style="list-style-type: none"> ➤ Nationalization of banks (1969 & 1980) ➤ Rural branch expansion
Early Technology Adoption	1991 – 2005	<ul style="list-style-type: none"> ✓ Liberalization of the economy ✓ Introduction of Core Banking Solutions (CBS) ✓ Growth in ATM networks 	<ul style="list-style-type: none"> ➤ Launch of CBS in early 2000s ➤ Establishment of IDRBT ➤ Emergence of internet banking
Emergence of Digital Platforms	2006 – 2014	<ul style="list-style-type: none"> ✓ Internet and mobile penetration ✓ Rise in Net & SMS banking ✓ Electronic payment systems implemented 	<ul style="list-style-type: none"> ➤ RTGS and NEFT systems operationalized ➤ e-KYC regulations introduced ➤ Digital customer onboarding
The Digital Revolution	2015- present	<ul style="list-style-type: none"> ✓ Digital India push ✓ Large-scale inclusion via PMJDY ✓ Fast growth of mobile and UPI-based payments 	<ul style="list-style-type: none"> ➤ UPI, BHIM, AePS, IMPS launched ➤ NPCI established 2016 ➤ Demonetization boosted digital payments

Source:(Akash Ranjan, 2025)

Digital Banking: Improvements and Benefits



Financial Inclusion

Digital banking has played a major role in bringing previously unbanked and underbanked populations into the financial system.

- The **Digital India programme** launched in 2015 aimed to connect rural and remote populations via high-speed internet, mobile connectivity, and Common Service Centres (CSCs), enabling access to financial services even in underserved areas (Sheokand & Gupta, 2017).
- The **Unified Payments Interface (UPI)**, Aadhaar Enabled Payment Systems (AePS), and mobile banking apps have extended banking to citizens without needing physical branches, particularly through mobile-based interfaces (Haque & Shoaib, 2023).
- In particular, **MSMEs in semi-urban Bihar** have reported improvements in business efficiency and revenue after adopting digital banking, due to faster payments and better recordkeeping (Meher et al., 2021).

2. Reduced Transaction Costs

- Digital banking significantly lowers the cost per transaction compared to in-person banking. The cost of **cash handling is around 1.7% of India's GDP**, a burden digital transactions help reduce (Kaur et al., 2021).
- Services like **RTGS, NEFT, and IMPS** allow real-time or near-real-time money transfers without requiring physical cash or travel, cutting transportation and labor costs (Meher et al., 2021).
- **Automation and smart contracts** within the proposed CBDC architecture are also expected to reduce operational costs in the long run (Haque & Shoaib, 2023).

3. Enhanced Transparency

- Digital records of transactions reduce informal cash dealings and promote accountability, both for individuals and enterprises.
- Digital payment systems **leave a verifiable audit trail**, discouraging black money and corruption (Sheokand & Gupta, 2017).



- Features like real-time transaction alerts, digital KYC (Know Your Customer), and tamper-proof blockchain-based ledgers used in CBDCs add another layer of integrity (Haque & Shoaib, 2023).

Challenges in Digital Banking Implementation

1. Rural Accessibility

- Despite infrastructure investments, **only 16% of rural populations** use the internet for digital payments, mainly due to poor connectivity and lack of awareness (Kaur et al., 2021).
- Many rural bank accounts opened under government schemes remain **inactive**; nearly **48% of 310 million accounts** opened between 2014–17 had no regular usage (World Bank, as cited in Kaur et al., 2021).

2. Cybersecurity Risks

- Increased digitization has raised concerns about **data theft, identity fraud, and system vulnerabilities**.
- Implementing robust **cybersecurity frameworks and encryption protocols** is crucial, especially with growing threats from phishing and malware in mobile banking (Haque & Shoaib, 2023).

3. Financial Literacy Gaps

- Many users, particularly in **rural and semi-urban areas**, still lack the confidence or knowledge to use digital platforms safely.
- Studies have shown that **trust, ease of use, and security awareness** are critical factors in encouraging adoption (Kaur et al., 2021; Meher et al., 2021).
- In-branch efforts like **customer demonstrations, vernacular language support**, and simplified interfaces can improve adoption among hesitant users (Kaur et al., 2021).

Impact Area	Improvements	Challenges
Financial Inclusion	Broader access via mobile banking, UPI, CSCs	Low adoption in rural areas, inactive accounts
Transaction Costs	Faster payments, reduced cash handling, automation potential	Initial infrastructure investment, digital divide



Transparency	Digital trails, fraud reduction, tamper-proof records	Need for regulatory clarity and oversight
Rural Accessibility	CSCs and mobile apps expand reach	Low internet access and smartphone penetration
Cybersecurity	Blockchain and encryption in CBDC design	Hacking, data breaches, poor user security practices
Financial Literacy	Training and in-branch demos raise awareness	Widespread lack of digital skills, especially among older adults

Conclusion

The emergence of digital banking in India has been significant, beginning with early computerization and core banking systems and culminating with the breakthrough of UPI, which greatly increased access, efficiency and transparency. The Central Bank Digital Currency (CBDC), also known as the digital rupee (e₹), aims to reduce dependency on cash, lower transaction costs, improve monetary policy transmission, and provide a secure alternative to cryptocurrencies. UPI's extensive acceptance presents opportunities for integrating e₹ into daily financial transactions, but hurdles include the digital divide, cybersecurity threats, and limited financial knowledge. Overcoming these challenges requires robust infrastructure development, solid security frameworks, and large-scale digital literacy programs, particularly in rural and semi-urban areas. Ultimately, the destiny of the digital rupee will be determined not only by technological competence, but also by inclusive and secure digitization, resulting in an efficient, egalitarian, and future-ready financial system for all Indians.

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