

India's Financial Sector in the Digital Age: A Study of Banking Transformation

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Abstract

Digital banking means using the internet or mobile apps to do banking. It has changed how people in India use money and access bank services. This research paper talks about how digital banking has helped more people open bank accounts, make payments easily and grow the Indian economy. It also discusses the problems of digital banking like internet issues and online fraud. The paper gives real-life examples and talks about what the future of banking in India could look like.

Along with this research, we also looked at the data of digital payment indicators and transactions from 2018 to 2024, which was published by RBI (Reserve Bank of India). This paper explores the evolution, benefits and challenges of digital banking in India. It's applying technological advancement and government policies for providing better results to the Indian financial sector.

Keywords: Digital banking, customer satisfaction, cyber security threats, digital literacy, covid-19 and banking, digital transactions and RBI.

Introduction

The advent of digital banking has been a big change in the Indian financial sector. Efficiency from integration of technology in the financial sector, increased security and accessibility. This paper aims to analyze the impact of digital banking on India's financial sector by exploring various dimensions, including economic growth, financial inclusion, regulatory changes, and challenges faced by the industry. It also assesses customer adoption trends, digital payment ecosystems, and the role of emerging technologies in reshaping the banking landscape.

Digital banking has become increasingly vital nowadays, particularly in the wake of the COVID-19 (2020) pandemics, which forced rapid digitization of banking services. During the pandemic maximum peoples are using credit/debit cards, digital wallets (like phone pay & google pay), bank transfer, UPI's and other modes of digital payments to protect themselves from disease.

This acceleration has not only changed customer expectations but also forced banks to innovate faster. The rise of smartphone penetration, affordable data, and tech-savvy younger generations have all contributed to the rapid adoption of digital financial services.

Objectives of study

1. To analyze the growth and adoption trends of digital banking in India using RBI payment system data from 2018 to 2024.

2. To examine the impact of digital banking on financial inclusion and customer convenience.
3. To identify the key benefits of digital banking, such as accessibility, cost-effectiveness, and user satisfaction.
4. To explore the major challenges faced in the adoption of digital banking, including cybersecurity, digital literacy, and infrastructure gaps.
5. To review the role of government initiatives and technological innovations (e.g., UPI, Jan Dhan Yojana, Digital India) in accelerating digital banking in India.

Review of Literature

Kaur, B. and Kiran, S. (2021) The rise of digital technologies and the COVID-19 pandemic have pushed banks to offer more digital services. While this has many benefits, it also changes how customers interact with their banks, which can affect their satisfaction and loyalty. To understand what influences customer satisfaction in digital banking, we surveyed 222 customers in Northern India using the SERVQUAL model, which looks at five service quality areas. We analyzed the results using Structural Equation Modelling and found that most customers are satisfied with digital banking. Among the five factors, **reliability** had the strongest impact on satisfaction, followed by **tangibility** (like the look and feel of digital services) and **responsiveness** (how quickly banks respond to customer needs).

Sharma, A. and Piplani, N. (2017) Their banking sector is a key part of any country's economy, and the use of technology in banking is growing rapidly. Today, customers want to do their banking anytime and from anywhere—without standing in queues or waiting on calls. To meet this demand, banks have introduced digital services like internet banking, mobile apps, digital wallets, and credit/debit cards. This paper looks at the latest digital banking trends in India and the challenges banks face in adopting them. The study shows that digital banking is growing fast and is likely to become the most preferred way of banking in the future, though it also brings some risks that need to be managed.

Shaik, I. and Anwar, M. (2022) The study says how digital banking transactions affect the performance of Indian banks. It focuses on how digital transaction methods impact financial and operational performance while helping to reduce banking costs. They analyzed data from 32 public and private banks between 2011 and 2020. The results show that public sector banks have a lower share of digital transactions compared to private banks. We found that a 1% increase in RTGS and NEFT transactions leads to small but positive growth in business per employee and improvements in the CASA-to-deposit ratio. RTGS also has a strong effect on the bank's advances. However, credit card use at ATMs and POS machines slightly increases the cost of funds. Based on these findings, we suggest two key actions: first, banks should promote RTGS transactions more actively to improve performance; second, they should encourage credit-based digital payments to reduce funding costs.

Motwani, A. and Vora, K. (2021) E-banking is a major innovation that has transformed the traditional banking landscape. It refers to the use of electronic devices and digital platforms to deliver banking services, eliminating the need for paper-based processes and in-person visits to bank branches. Through automated and interactive communication channels, customers can now access both traditional and modern financial services with ease and efficiency.

Chinnasami, G., Vinoth, S. & Jain, A. (2024) Researchers conducted a study to understand how people in rural areas use digital banking and whether they plan to continue using it in the future. Researchers collected responses from 360 bank customers and analyzed the data. The research focused on five main factors, how useful and easy digital banking is, how satisfied and trustworthy users are, and their intention

to continue using it. The results showed that it is very important to build a secure and user-friendly digital banking system for rural users. It also highlighted that rural India still faces many challenges in terms of using online banking.

History of Digital Banking in India

Digital banking in India has changed a lot over the years. It started in the late 1990s and early 2000s, when some banks began offering basic online services. These services included things like checking account balances or transferring money between accounts using a computer. At that time, digital banking was still very new and not many people used it.

But things really started to improve in the 2010s. Thanks to smartphones and better internet connections, more people began using mobile apps to do their banking. Around 2010, many banks launched mobile banking apps that made it easy for customers to check balances, send money, and pay bills from their phones.

A big turning point came in **2016** when **UPI (Unified Payments Interface)** was introduced. UPI made it super easy to send money from one bank account to another instantly using a mobile app. It became one of the most popular ways to pay for things online and in shops.

The **Indian government** also helped support digital banking. Programs like **Digital India** and **Jan Dhan Yojana** encouraged people to open bank accounts and use online banking. In 2016, the government's **demonetization** policy (removing certain currency notes from use) pushed many people to start using digital payments because cash was limited.

During this time, many **fintech companies** (technology companies focused on financial services) also entered the market. These startups created new apps and services for digital payments, loans, saving money, and more. They helped bring banking services to people in remote or rural areas who didn't have access before.

When the **COVID-19 pandemic** hit in 2020, digital banking became even more important. Since people couldn't go outside easily due to lockdowns, they started using online banking more than ever. To avoid the epidemic, people gave more importance to digital and online banking so that the chances of spreading the epidemic are reduced. This pushed both old and new banks to improve their websites and mobile apps. Apart from this, machines like sound box and POS were also promoted by the financial sector.

The **Reserve Bank of India (RBI)** made sure that digital banking remained safe. It created rules to protect customer information and stop fraud. The RBI also allowed digital **KYC (Know Your Customer)**, which means people could open accounts or verify their identity online using Aadhaar or other ID methods. Overall, digital banking in India has grown fast because of better technology, government support, new fintech companies, and changing customer habits. Today, millions of people use digital banking every day to make payments, save money, apply for loans, and manage their finances easily and safely.

Benefits of Digital Banking

Digital banking has significantly transformed the financial ecosystem in India by offering a wide range of services through digital platforms. These advancements have enhanced user convenience, reduced the reliance on physical bank branches, and improved overall banking efficiency. The following are the key benefits:

- 1. Convenience and Accessibility:** One of the most significant advantages of digital banking is its round-the-clock availability. Customers can perform transactions, check balances, and manage

accounts at any time—day or night—without being restricted by banking hours or public holidays. With 24/7 service availability, customers now enjoy the ease of transferring funds, paying bills, investing, and more from their smartphones.

2. **Comprehensive Information Access:** Digital platforms provide users with easy access to detailed information about financial products, interest rates, transaction history, and educational resources. This transparency helps users make informed financial decisions and fosters a stronger relationship between banks and their customers.
3. **Improved Security Measure:** Modern digital banking systems incorporate advanced security protocols such as data encryption, multi-factor authentication, and secure login methods to ensure safe and secure transactions. These measures boost consumer confidence in using digital channels for their financial activities.
4. **Cost Transparency and Reduced Charges:** Many digital banking services offer low or zero-cost transactions, including free fund transfers and minimal service charges. This affordability appeals to a wider range of customers and contributes to increased financial inclusion.
5. **User-Friendly Interfaces:** Banks have invested in creating intuitive, responsive platforms that are compatible with multiple devices. Whether on a smartphone, tablet, or desktop, users experience consistent, streamlined access to banking services.
6. **Real-Time Financial Management:** Customers can monitor their account balances, view transaction details, and receive instant notifications, enabling better control over their finances and reducing dependency on traditional banking channels.
7. **Elimination of Physical Branch Visits:** With the convenience of online and mobile banking, routine tasks such as fund transfers, bill payments, and loan applications can be completed digitally. This eliminates the need for time-consuming visits to bank branches, especially in remote or rural areas. Infect online customer service representatives are also made available in case the customer has any queries or concerns regarding the same
8. **High User Satisfaction:** Despite relatively lower penetration in some segments, customer satisfaction with digital banking tools remains high. Surveys have consistently shown that a majority of users rate their experience positively, indicating growing trust and acceptance of digital financial services.
9. **Personalized Banking Experience:** Digital banking platforms often allow users to customize their dashboards and menus, making it easier to access frequently used features and services. This level of personalization enhances the user experience and promotes engagement.

Challenges of Digital Banking

Even though digital banking is growing fast in India and more people are using it every day, there are still many problems that stop it from reaching its full potential. These challenges come from different areas—such as technology issues, lack of awareness among people, and complex rules set by the government and banks.

To make digital banking truly successful for everyone, we need to understand these problems clearly. Only then can we find the right solutions to make online banking safe, easy, and available to all—whether they live in cities or villages, are young or old, rich or poor.

Cybersecurity Threats and Data Breaches: With increased digitization of financial services comes heightened exposure to cybersecurity threats. Cybercriminals constantly attempt to exploit vulnerabilities in banking systems through malware, phishing attacks, ransomware, and identity theft. Even with

advancements in encryption and two-factor authentication, sophisticated hacking techniques continue to pose a major threat. These attacks not only lead to financial loss but also damage the reputation of financial institutions, resulting in reduced trust among customers.

Example: The rise in UPI-based fraud cases in India in recent years has highlighted the need for stricter security protocols and greater user awareness.

Low Levels of Digital Literacy: A significant proportion of India's population lacks the necessary digital literacy to use online banking services effectively. Many users are unaware of basic concepts like secure passwords, phishing scams, and digital etiquette. This problem is particularly prevalent in rural areas and among senior citizens. As a result, even when digital infrastructure is available, many people remain excluded from digital banking due to a lack of skills and knowledge.

Impact: Limited awareness can lead to errors in transactions, increased vulnerability to fraud, and a general reluctance to shift from traditional banking methods.

Poor Internet Connectivity and Infrastructure Gaps: Although India has made strides in expanding internet connectivity, many regions—particularly in tier-3 cities, towns, and rural areas—still suffer from poor network coverage, low bandwidth, and frequent outages. Digital banking requires stable and fast internet to ensure seamless and real-time transactions. In areas where this infrastructure is lacking, users often experience delays or failed transactions, discouraging them from relying on digital platforms.

Note: According to the Telecom Regulatory Authority of India (TRAI), internet penetration in rural India is still significantly lower than urban areas.

Frequent Technical Glitches and System Downtime: Digital banking platforms are expected to function smoothly around the clock. However, technical failures such as app crashes, server outages, and failed transactions can cause significant inconvenience to users. Inconsistent performance undermines the reliability of digital banking, especially during urgent or time-sensitive transactions.

Consequence: Such issues often drive users back to branch-based banking, slowing down digital adoption.

Rising Incidences of Digital Fraud: Digital frauds in the form of fake apps, phishing links, fraudulent calls pretending to be from bank representatives, and unauthorized fund transfers have become increasingly common. Many of these scams target low-income or less tech-savvy individuals who may not be familiar with safe digital practices.

Challenge: While banks have security protocols in place, educating users about safe online behavior remains a significant challenge.

Complex Regulatory Compliance: Banks and fintech companies must navigate a complex regulatory landscape that governs data privacy, financial transactions, cyber laws, and customer authentication. Regular updates in compliance guidelines, such as RBI's mandates on digital lending or KYC, require constant adaptation. Smaller financial institutions and startups often struggle to keep up with these changes.

Impact: Delays in compliance or misinterpretation of guidelines can result in penalties, service interruptions, or customer dissatisfaction.

Lack of Trust and Privacy Concerns: Users often worry about how their financial and personal data is handled by banks and third-party apps. Concerns about surveillance, unauthorized data sharing, or breaches of privacy policies lead many customers to avoid digital platforms. In a country where trust is a key factor in financial behavior, overcoming these concerns is essential for digital banking to thrive.

Suggestion: Transparent communication and adherence to data protection laws (like the upcoming Digital Personal Data Protection Act) are crucial.

Language Barriers and Lack of Accessibility: India is home to a linguistically diverse population, but most digital banking interfaces are predominantly in English or Hindi. This excludes a large segment of users who are comfortable in regional languages. Additionally, many platforms lack accessibility features for people with disabilities, such as text-to-speech options, voice commands, or screen readers.

Effect: This creates a digital divide and goes against the principles of inclusive banking.

Resistance to Change and Traditional Preferences: A substantial portion of the population still prefers traditional banking methods due to familiarity and perceived safety. Older individuals, those in rural areas, and those with limited exposure to technology often view digital platforms as complex or unreliable. Changing long-standing behavioral patterns and mindsets is a gradual process that requires trust-building and consistent education.

Challenge: Without addressing user hesitation, digital banking adoption will remain uneven across different demographics.

Inadequate Customer Support for Digital Services: Many users who face problems while using digital platforms struggle to get timely support. Automated responses and chatbots often fail to resolve specific issues, leading to user dissatisfaction. Unlike in-branch visits where personal assistance is available, digital users often feel isolated when they encounter problems.

Outcome: Poor post-service experience can deter users from continuing with digital banking services.

Research Methodology

This study is primarily based on secondary data analysis and a qualitative review of existing literature. The following methods were adopted to explore the impact of digital banking on India’s financial sector.

Data Collection: Secondary data was collected from official sources such as the Reserve Bank of India (RBI), government publications, and reports from financial institutions. data on digital transactions, including UPI, NEFT, IMPS, card payments, and other digital modes, was used to assess the growth and adoption trends in digital banking from 2018 to 2024. relevant statistics from RBI’s Payment System Indicators were analyzed to observe changes in transaction volume and value over time.

Analysis and Interpretations

The evolution of digital banking in India can be clearly seen through the increasing volume and value of transactions across various digital platforms. To understand the magnitude of this transformation, the Payment System Indicators from the Reserve Bank of India (RBI) for the years 2018-2021 and 2021–2024 have been analyzed. These indicators highlight the rapid growth in retail digital payments, the dominance of UPI, and the overall shift from paper-based to electronic banking.

Payment System Indicators – Annual Turnover (April - March)						
Item	Volume (Lakh)			Value (₹ Crore)		
	2018-19	2019-20	2020-21	2018-19	2019-20	2020-21
A. Settlement Systems						
CCIL Operated Systems	36	36	28	11655103	8	16194314
B. Payment Systems						
1. Large Value Credit Transfers – RTGS	1366	1507	1592	13568818	7	10559984

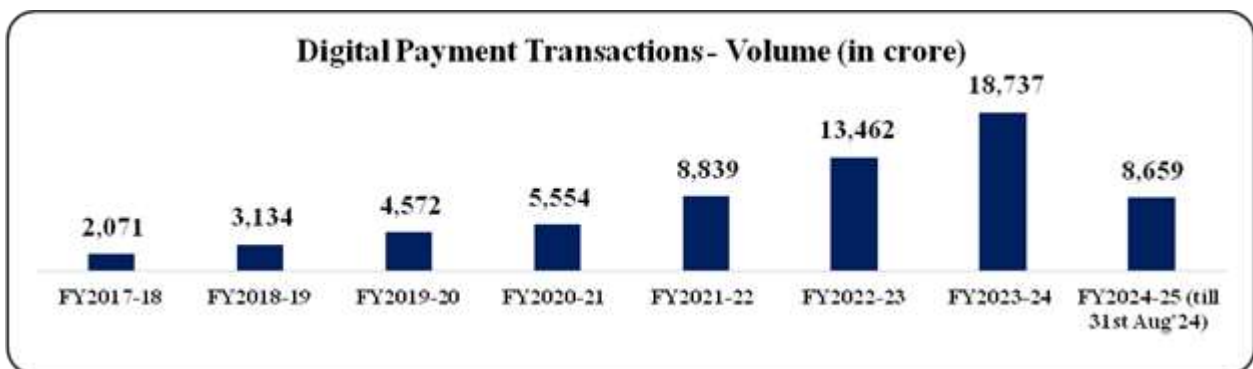
Retail Segment	-	-	-	-	-	-
2. Credit Transfers	118481	206506	317852	26090471	28562857	33522150
2.1 AePS (Fund Transfers)	11	10	11	501	469	623
2.2 APBS	14949	16766	14373	86226	99179	112747
2.3 ECS Cr	54	18	0	13235	5145	0
2.4 IMPS	17529	25792	32783	1590257	2337541	2941500
2.5 NACH Cr	8834	11290	16450	729673	1043212	1232714
2.6 NEFT	23189	27445	30928	22793608	22945580	25130910
2.7 UPI	53915	125186	223307	876971	2131730	4103658
3. Debit Transfers and Direct Debits	4914	7525	10456	524556	719708	872552
3.1 BHIM Aadhaar Pay	68	91	161	815	1303	2580
3.2 ECS Dr	9	1	0	1260	39	0
3.3 NACH Dr	4830	7340	9630	522461	718166	868906
3.4 NETC (Linked to Bank Account)	6	93	650	20	200	913
4. Card Payments	61769	72384	57841	1196888	1434814	1293822
4.1 Credit Cards	17626	21773	17641	603413	730895	630414
4.2 Debit Cards	44143	50611	40200	593475	703920	662667
5. Prepaid Payment Instruments	46072	53318	49392	213323	215558	197695
6. Paper-based Instruments	11238	10414	6704	8246065	7824822	5627189
Total – Retail Payments (2+3+4+5+6)	242473	350147	442229	36271303	38757759	41512514
Total Payments (1+2+3+4+5+6)	243839	351654	443821	17195949	0	14711236
Total Digital Payments (1+2+3+4+5)	232602	341240	437118	16371342	5	14148517
				162089413		3

Payment System Indicators - Annual Turnover (April - March)						
Item	Volume (lakh)			Value (₹ lakh crore)		
	2021-22	2022-23	2023-24	2021-22	2022-23	2023-24
A. Settlement Systems						
CCIL Operated Systems	33	41	43	2068.7	2588	2592.1
B. Payment Systems						
1. Large Value Credit Transfers - RTGS	2078	2426	2700	1286.6	1499.5	1708.9
Retail Segment (2 to 6)	-	-	-	-	-	-
2. Credit Transfers	577935	983621	1486107	427.3	550.1	675.4
2.1 AePS (Fund Transfers)	10	6	4	0.006	0.004	0.003
2.2 APBS	12573	17834	25888	1.3	2.5	3.9
2.3 ECS Cr	-	-	-	-	-	-

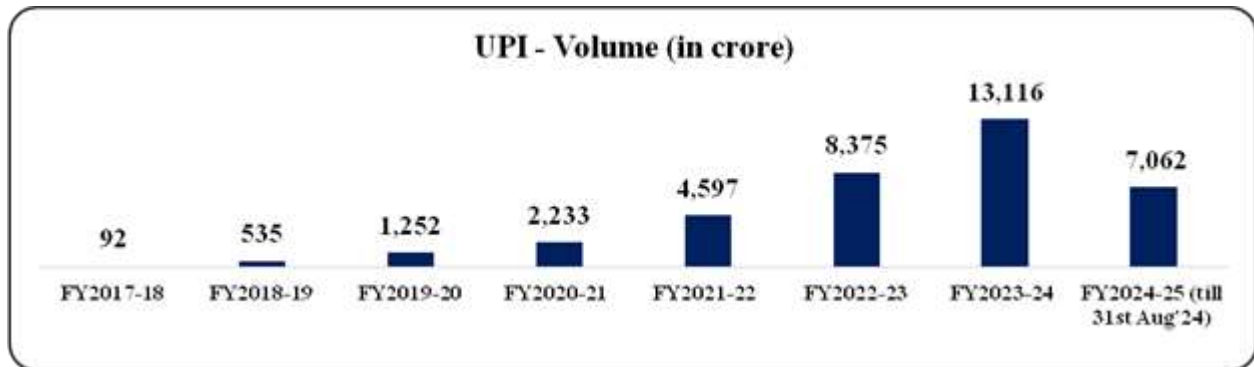
2.4 IMPS	46625	56533	60053	41.7	55.9	65
2.5 NACH Cr	18758	19257	16227	12.8	15.4	15.3
2.6 NEFT	40407	52847	72640	287.3	337.2	391.4
2.7 UPI	459561	8371444	1311295	84.2	139.1	200
3. Debit Transfers and Direct Debits	12189	15343	18250	13.9	16.2	16.9
3.1 BHIM Aadhaar Pay	228	214	194	0.1	0.1	0.1
3.2 ECS Dr	-	-	-	-	-	-
3.3 NACH Dr	10755	13503	16426	10.3	12.8	16.8
3.4 NETC (Linked to Bank Account)	1207	1626	1629	0.02	0.03	0.03
4. Card Payments	61783	63325	58470	17	21.5	24.2
4.1 Credit Cards	22399	29145	35610	9.7	14.3	18.3
4.2 Debit Cards	39384	34179	22860	7.2	7.2	5.9
5. Prepaid Payment Instruments	65783	74667	78775	2.8	2.9	2.8
6. Paper-based Instruments	6999	7109	6632	56.1	71.7	72.1
Total Retail Payments (2+3+4+5+6)	7246989	11440655	1643822	523.9	659.1	791.5
Total Payments (1+2+3+4+5+6)	7262767	11446491	1650934	1810.5	2158.6	2500.4
Total Digital Payments (1+2+3+4+5)	7199768	1139382	1644032	1744	2086.8	2428.2

Findings

Fast Growth in Digital Payments- Digital transactions in India have grown quickly between 2018 and 2024. According to RBI data, systems like UPI, NEFT, and card payments are now widely used. UPI has become the most popular because it is easy to use and allows instant money transfers.



UPI Is the Most Used Payment Method- UPI transactions increased massively—from 53,915 lakh in 2018–19 to over 13 crores in 2023–24. This shows how people in both cities and villages have started using UPI. Its simple mobile interface and fast payments have made it a top choice for users.



More People Included in the Banking System- Government programs like Jan Dhan Yojana and Aadhaar linking have helped more people open bank accounts. This has brought many poor and rural individuals into the formal banking system and supported the use of digital banking.

Greater Convenience for Customers- Digital banking allows customers to access services any time, without needing to visit a bank branch. People can check balances, transfer money, and make payments 24/7. This has made banking faster, easier, and more satisfying for users.

Challenges Still Exist- Even though digital banking is growing, some problems continue. In rural areas, internet connectivity is weak, many people are not familiar with digital tools, and there are risks of cyber fraud. These issues make some people afraid to use digital banking.

Gap Between Urban and Rural Areas- Digital banking is used more in cities than in villages. Rural areas still face challenges like low internet access, fewer smartphones, and lack of digital education. More awareness programs and better infrastructure are needed to close this gap.

COVID-19 Boosted Digital Banking- During the COVID-19 pandemic, more people started using digital banking. Contactless payments and online services became more common as people avoided going out. This helped increase trust and use of digital platforms even in areas where it was not popular before.

Conclusion

Digital banking has significantly transformed India's financial sector, driven financial inclusion and improving economic growth. The future looks bright, but efforts needed to make digital banking safe, easy to understand and available for everyone. In India most of the places people do not trust on digital banking. Because they were not aware of how it works or how safe it can be. A lack of education and digital is a major reason behind this. To solve this, more awareness programs, digital training, and strong security measures are needed –especially in rural and less - developed areas.

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