



AN ANALYTICAL STUDY ON THE GROWTH OF DIGITAL PAYMENTS IN INDIA

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Abstract

The present study analyzes the growth of digital payment systems in India during the period 2020–2024. The rapid advancement of financial technology and strong policy initiatives have significantly transformed India's payment ecosystem from a cash-dominated system to a digitally driven economy. This study examines major digital payment instruments such as UPI, Mobile Banking, NEFT, RTGS, Debit Cards, Credit Cards, and POS infrastructure using secondary data collected from the Reserve Bank of India and the National Payments Corporation of India. Growth trends are evaluated using percentages and Compound Annual Growth Rate (CAGR). The findings indicate that UPI recorded the highest growth, emerging as the dominant digital payment platform. Mobile banking also showed strong expansion, while NEFT and RTGS maintained steady growth. Credit cards grew faster than debit cards, and the expansion of POS terminals reflects increasing merchant digitization. Overall, the study concludes that India is experiencing a significant structural shift toward a mobile-first and less-cash economy, strengthening digital financial infrastructure and economic efficiency.

Key Words: *Digital Payments, UPI, Mobile Banking, RTGS, Financial Inclusion, Digital Infrastructure.*

Introduction

The rapid advancement of digital technology has significantly transformed the financial landscape across the world, and India stands as one of the leading examples of this transformation. Over the past decade, digital payment systems have emerged as a crucial component of the country's financial infrastructure, reshaping the way individuals, businesses, and institutions conduct financial transactions. The introduction of innovative platforms such as Unified Payments Interface (UPI), mobile banking, NEFT, RTGS, debit and credit cards, and point-of-sale (POS) terminals has accelerated the transition from cash-based transactions to a digitally driven economy.

India's digital payment revolution gained substantial momentum after the launch of initiatives such as Digital India, Pradhan Mantri Jan Dhan Yojana (PMJDY), and the promotion of cashless transactions following demonetization in 2016. These initiatives were further strengthened by improvements in internet connectivity, smartphone penetration, Aadhaar integration, and fintech innovations. As a result, digital payment adoption has expanded rapidly across urban, semi-urban, and rural regions, contributing to greater financial access and economic participation.

The period between 2020 and 2024 has been particularly significant in accelerating digital payment growth. The COVID-19 pandemic encouraged contactless transactions, boosting the usage of mobile-based platforms and online fund transfer systems. Unified Payments Interface (UPI) has emerged as the dominant retail digital payment system, demonstrating exponential growth in both transaction volume and value. Simultaneously, traditional electronic transfer systems such as NEFT and RTGS



have continued to grow steadily, reflecting expanding formal financial activity. The increasing number of debit and credit cards and the expansion of POS infrastructure further indicate structural strengthening of India's digital payment ecosystem.

Analyzing the growth trends of digital payment systems is essential to understand the pace, pattern, and direction of financial digitalization in India. A systematic examination using growth indicators such as Compound Annual Growth Rate (CAGR) and trend analysis provides insights into which payment instruments are driving the transformation and how the digital ecosystem is evolving over time.

Therefore, this study aims to analytically examine the growth of major digital payment systems in India during the recent five-year period. By evaluating transaction volume, transaction value, infrastructure expansion, and growth rates, the study seeks to provide a comprehensive understanding of India's digital payment expansion and its implications for the broader financial system.

I. Need for the study

Digital payments have emerged as a key component of India's financial system, significantly transforming the traditional cash-based economy into a digitally driven ecosystem. In recent years, platforms such as UPI, mobile banking, NEFT, RTGS, and card-based payments have recorded substantial growth. The period from 2020 to 2024 is especially crucial due to accelerated digital adoption influenced by technological advancements and the COVID-19 pandemic. A systematic analysis using measurable indicators like CAGR is necessary to understand growth trends, comparative performance, and the structural transformation of India's digital payment landscape.

II. Review of Literature

Gupta, A. (2017), in the study titled "*Adoption of Mobile Banking and Digital Payments in India*," examined the factors influencing the adoption of mobile-based payment systems among Indian consumers. The objective of the study was to analyze customer perception, awareness, and behavioral intention toward digital payments. The findings revealed that ease of use, perceived security, and technological accessibility significantly influence digital payment adoption. The study concluded that increased smartphone penetration and government initiatives accelerated the growth of mobile-based financial transactions in India.

Boro, K. (2015), in the research titled "*Technological Innovations and Growth of Indian Banking Sector*," analyzed the impact of digital technologies such as ATMs, internet banking, RTGS, and electronic fund transfers on banking performance. The objective was to evaluate how technological advancements contributed to banking efficiency and payment modernization. The findings indicated that digital infrastructure expansion played a critical role in enhancing transaction speed, reducing operational costs, and promoting electronic payment usage across the country.

Singh, S. & Rana, R. (2018), in their study titled "*Impact of Demonetization on Digital Payment Systems in India*," examined the surge in digital payment transactions following the demonetization policy. The objective was to assess the shift from cash-based transactions to digital modes. The study found a significant increase in UPI, mobile wallets, and card-based transactions post-demonetization. It concluded that policy intervention acted as a catalyst in accelerating digital payment growth and encouraging cashless transactions.



Lauer, K. & Lyman, T. (2015), in the report titled “*Digital Financial Inclusion: Implications for Customers, Regulators, Supervisors and Standard-Setting Bodies*,” explored the role of digital financial services in expanding access to formal finance. The objective was to evaluate the scalability and sustainability of digital payment systems in developing economies. The findings highlighted that digital platforms significantly lower transaction costs, improve accessibility, and enhance efficiency, thereby supporting rapid growth in digital financial services.

Demirgüç-Kunt, A., Klapper, L., Singer, D., & Ansar, S. (2021), in the World Bank report titled “*The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19*,” analyzed global trends in account ownership and digital payment usage. The objective was to measure progress in digital financial adoption across countries. The report revealed substantial growth in digital payment usage in India between 2014 and 2021, particularly during the COVID-19 period, indicating a structural shift toward digital transactions and strengthening of the formal financial system.

III. Research Gap

Existing literature largely focuses on financial inclusion, digital banking adoption, and the impact of policy measures such as demonetization on digital transactions in India. Many studies examine behavioral factors influencing digital payment usage or discuss technological innovations in the banking sector. However, limited research provides a comprehensive analytical comparison of major digital payment instruments such as UPI, mobile banking, NEFT, RTGS, cards, and POS infrastructure. Additionally, there is a lack of recent post-2020 data-driven analysis using measurable indicators like CAGR to assess growth patterns. Therefore, this study bridges the gap by offering a systematic evaluation of digital payment growth in India during 2020–2024.

IV. Objectives of the Study

- To examine the growth trend of major digital payment systems in India from 2020 to 2024.
- To analyze the transaction volume and value of key digital payment instruments such as UPI, Mobile Banking, NEFT, RTGS, Debit Cards, Credit Cards, and POS terminals.

V. Research Methodology

A. Nature of the Study

The study is descriptive and analytical in nature. It focuses on evaluating growth trends of digital payment systems using secondary data.

B. Data Source

The study is based on secondary data collected from authentic sources such as:

- Reserve Bank of India (RBI) Reports
- National Payments Corporation of India (NPCI) publications
- Ministry of Finance and Government releases
- Payment system statistical reports

The data covers a five-year period from 2020 to 2024.

C. Tools and Techniques Used

Percentages and Compound Annual Growth Rate (CAGR) is used to analyse the data.



D. Period of Study

The study covers the period from 2020 to 2024.

E. Scope of the Study

The study is limited to major digital payment systems operating in India and does not cover micro-level regional analysis.

VII. Data Analysis and Interpretation

Table1: Unified Payments Interface (UPI) Growth

Year	UPI Volume (Billion)	UPI Value (Trillion)
2020	22.3	41.0
2021	38.7	71.5
2022	74.0	126.0
2023	117.6	182.0
2024	131.0	200.0
CAGR (in%)	55.7	48.6

Source: National Payments Corporation of India (NPCI) — UPI Product Statistics

The data shows that UPI has recorded exceptional growth between 2020 and 2024. Transaction volume increased from 22.3 billion to 131.0 billion, registering a CAGR of 55.7%, while transaction value rose from 41 trillion to 200 trillion, with a CAGR of 48.6%. The higher growth in volume compared to value indicates widespread use of UPI for small and medium retail transactions. The sharp upward trend reflects increasing smartphone penetration, improved digital infrastructure, and strong policy support for cashless transactions. Overall, UPI has emerged as the leading digital payment platform, driving India’s transition toward a mobile-first and digitally integrated payment ecosystem.

Table 2: Mobile Banking Transactions

Year	Volume (Million)	Value (Trillion)
2020	2,500	90
2021	3,800	140
2022	5,500	210
2023	7,200	290
2024	8,500	350
CAGR (in%)	35.8	40.5

Source: RBI Annual Reports (2019–20 to 2023–24)

The data indicates that mobile banking transactions have shown strong and consistent growth from 2020 to 2024. The transaction volume increased from 2,500 million in 2020 to 8,500 million in 2024, registering a CAGR of 35.8%. Similarly, the transaction value rose from 90 trillion to 350 trillion, with a higher CAGR of 40.5%. The higher growth rate in value compared to volume suggests increasing confidence among users in conducting larger transactions through mobile platforms. This upward trend reflects rising smartphone penetration, improved digital literacy, and growing trust in mobile-based financial services, making mobile banking a significant contributor to India’s digital payment expansion.



Table 3: NEFT (National Electronic Funds Transfer) Transactions

Year	Volume (Million)	Value (Trillion)
2020	2,750	229
2021	3,800	310
2022	4,500	380
2023	4,900	410
2024	5,200	450
CAGR (in%)	17.2	18.4

Source: National Payments Corporation of India (NPCI)

The data shows that NEFT transactions have experienced steady and moderate growth during the period 2020–2024. The transaction volume increased from 2,750 million in 2020 to 5,200 million in 2024, registering a CAGR of 17.2%. Similarly, the transaction value rose from 229 trillion to 450 trillion, with a CAGR of 18.4%. The nearly similar growth rates in volume and value indicate balanced expansion in both the number and size of transactions. The consistent upward trend reflects the growing reliance on NEFT for retail and business fund transfers, especially after the introduction of 24×7 NEFT services, strengthening its role in India’s digital payment ecosystem.

Table 4: RTGS (Real Time Gross Settlement) Transactions

Year	Volume (Million)	Value (Trillion)
2020	110	1,300
2021	135	1,500
2022	160	1,750
2023	185	1,950
2024	200	2,100
CAGR (in%)	16.2	12.7

Source: RBI Annual Reports (respective years 2019–20 to 2023–24)

The data indicates that RTGS transactions have shown steady growth from 2020 to 2024. The transaction volume increased from 110 million in 2020 to 200 million in 2024, registering a CAGR of 16.2%. Meanwhile, the transaction value rose from 1,300 trillion to 2,100 trillion, with a comparatively lower CAGR of 12.7%. The higher growth in volume than value suggests a gradual increase in the number of high-value transactions rather than a sharp rise in average transaction size. Since RTGS is primarily used for large-value corporate and institutional transfers, the consistent upward trend reflects expansion in formal financial activities and strengthening of India’s high-value digital payment infrastructure.

Table 5: Debit and Credit Card Transactions

Year	Debit Cards (Million)	Credit Cards (Million)
2020	830	62
2021	920	67
2022	980	75
2023	1,020	89
2024	1,050	100
CAGR (in%)	6.1	12.7

Source: RBI Annual Reports (respective years 2019–20 to 2023–24)



The data shows that debit and credit cards have experienced steady growth between 2020 and 2024. Debit cards increased from 830 million in 2020 to 1,050 million in 2024, registering a modest CAGR of 6.1%. This relatively slow growth suggests market maturity and a gradual shift toward mobile-based payment systems such as UPI. In contrast, credit cards rose from 62 million to 100 million during the same period, recording a higher CAGR of 12.7%. The stronger growth in credit cards indicates rising consumer spending, expanding access to formal credit, and increasing participation in organized retail and digital commerce.

Table 6: POS Terminals & Digital Infrastructure

Year	POS Terminals (Million)	ATMs
2020	4.4	209,000
2021	5.0	213,000
2022	6.1	219,000
2023	7.5	225,000
2024	8.5	230,000
CAGR (in%)	17.9	2.4

RBI Annual Reports (respective years 2019–20 to 2023–24)

The data indicates contrasting growth patterns in digital infrastructure between POS terminals and ATMs from 2020 to 2024. POS terminals increased from 4.4 million in 2020 to 8.5 million in 2024, registering a strong CAGR of 17.9%. This significant growth reflects rapid merchant digitization and increasing acceptance of digital payments across retail outlets, including semi-urban and rural areas. In contrast, ATMs grew marginally from 209,000 to 230,000 during the same period, with a low CAGR of 2.4%. The slow expansion of ATMs suggests a gradual decline in cash dependency, highlighting a structural shift toward digital and contactless payment systems in India.

VIII. Findings and Conclusion

Findings

- UPI recorded the highest growth among all digital payment systems, with a CAGR of 55.7% in volume and 48.6% in value. This indicates that UPI has become the primary driver of digital payment expansion in India.
- Mobile banking transactions showed significant growth, with volume CAGR of 35.8% and value CAGR of 40.5%. This reflects increasing smartphone usage and growing trust in mobile-based financial services.
- NEFT demonstrated moderate and consistent growth (17.2% in volume and 18.4% in value), indicating its continued importance in retail and business fund transfers.
- RTGS transactions showed stable growth (16.2% in volume and 12.7% in value), reflecting expansion in high-value corporate and institutional transactions.
- Debit cards grew slowly (6.1%), suggesting market maturity and substitution by mobile payments. In contrast, credit cards showed stronger growth (12.7%), indicating rising consumer credit participation.
- POS terminals recorded strong growth (17.9%), while ATM growth remained minimal (2.4%). This contrast highlights a structural shift from cash-based transactions toward digital payment infrastructure.

Conclusion

The present study analyzed the growth trends of major digital payment systems in India during the period 2020–2024. The findings clearly indicate that India is undergoing a significant structural



transformation toward a digitally driven payment ecosystem. Among all instruments, Unified Payments Interface (UPI) has emerged as the dominant platform, recording the highest growth rate in both transaction volume and value. Mobile banking has also shown strong expansion, reflecting increasing digital adoption and user confidence in mobile-based financial services.

Traditional electronic transfer systems such as NEFT and RTGS continue to grow steadily, demonstrating their sustained relevance in retail and institutional transactions. While debit card growth appears moderate, credit cards show rising consumer participation in formal credit systems. The rapid increase in POS terminals alongside minimal ATM growth further confirms a gradual shift from cash-based transactions to digital payment modes.

Overall, the study concludes that digital payments in India are expanding at a robust pace, supported by technological advancements, policy initiatives, and increasing financial awareness. The growth patterns indicate a clear movement toward a mobile-first and less-cash economy, strengthening India's digital financial infrastructure and enhancing efficiency in the payment system.

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