

# **A Study on Growth and Trends of Digital Payment Systems in India: A Secondary Data Analysis**

**Dr. Dilshad Burzin Patel**

**Assistant Professor,**

**S. B. Garda & P. K. Patel of College of Commerce, Navsari**

**Dr. Trusha Prakashbhai Gajjar**

**Assistant Professor,**

**S. B. Garda & P. K. Patel of College of Commerce, Navsari**



## **Abstract:**

Digital payment systems are electronic systems that allow people, companies, and organizations to send money or make payments via channels made possible by technology. Due to the digitalization of the financial system, interoperable payment infrastructure, and growing usage of mobile-based payment channels, digital payments have grown rapidly in India. The growth and trends of India's four main electronic payment systems—Unified Payments Interface (UPI), National Electronic Funds Transfer (NEFT), Real Time Gross Settlement (RTGS), and Immediate Payment Service (IMPS)—are examined in this study from 2020–2021 to 2024–2025. The study looks at both transaction volume and transaction value using secondary data gathered from the Reserve Bank of India's (RBI) Payment System Indicators. Compound annual growth rate (CAGR), percentage growth, year-over-year growth, tabulation, and graphical analysis are among the descriptive and comparative methods used. According to the findings, RTGS consistently accounted for the highest transaction value among the chosen systems, while UPI experienced the largest increase in transaction volume. While IMPS showed moderate volume increase with ongoing transaction value expansion, NEFT showed steady growth. The results show that payment-system performance should be evaluated using both volume and value indicators and emphasize the distinct functional functions of the chosen payment systems.

## **1. Introduction:**

Digital payment systems are electronic tools that allow people, companies, and organizations to send, receive, and complete financial transactions online without using actual cash. Because they enable quicker, more convenient, accessible, and transparent financial transactions, they have become an essential part of contemporary financial systems. By promoting financial inclusion, increasing transaction efficiency, and decreasing reliance on cash-based payments, the development of digital payment infrastructure has also aided in the wider digital transformation of economies.

Over the past ten years, India's digital payments environment has undergone a substantial transition. The adoption of electronic payment methods has surged across retail and institutional categories due to the expansion of digital infrastructure, rising smartphone and internet usage, technological innovation, and supportive governmental efforts. As a result, digital payments have developed from a different kind of payment to a crucial part of regular financial transactions in the Indian economy.

Within India's digital payments ecosystem, a number of payment systems function, each meeting distinct transaction needs. Instantaneous bank-to-bank transactions via mobile and

other digital platforms are made possible by the Unified Payments Interface (UPI), which has become a popular method for retail digital payments. The Real Time Gross Settlement (RTGS) system is mainly intended for high-value transactions and real-time settlement, whilst the National Electronic Funds Transfer (NEFT) enables electronic financial transfers between bank accounts. The Immediate Payment Service (IMPS) facilitates 24/7 transactions and offers an instantaneous electronic payment transfer between banks. The various needs of India's payment environment, from high-volume retail transactions to high-value institutional settlements, are reflected in the cohabitation of these systems.

The growth of digital payments cannot be evaluated solely through transaction volumes. An analysis of both transaction volume and transaction value offers a more comprehensive perspective on the evolving structure of the digital payment ecosystem. Although a particular payment system may record the highest number of transactions, another may represent a significantly greater monetary value due to its predominant use for high-value transfers. Hence, considering both transaction volume and value is essential for assessing the relative importance of various payment instruments and identifying shifts in their usage patterns over time.

Despite the growing adoption of digital payments in India, a comparative examination of major payment instruments based on both transaction volume and transaction value over a common period can provide valuable insights into their changing roles within the payment ecosystem. In this context, the present study examines the growth and trends of selected major digital payment systems in India during the period 2020–21 to 2024–25. The study focuses on UPI, NEFT, RTGS, and IMPS, analysing their transaction volumes and values, comparing their respective growth patterns, and examining their relative significance across both dimensions. Based on secondary data, the study employs descriptive analytical techniques to present an empirical assessment of the structural changes and evolving patterns in India's digital payment landscape.

## **2. Review of Literature**

The literature on digital payment systems has expanded considerably with the rapid development of financial technologies and changing consumer payment behaviour. Existing research broadly focuses on the evolution of electronic payment infrastructure, adoption of mobile and digital payments, financial inclusion, and the development of India's digital payment ecosystem.

Sumanjeet (2009) examined the emergence of electronic payment systems in India and highlighted the role of technological innovation and infrastructure in transforming conventional payment mechanisms. At the international level, Dahlberg et al. (2015), through

a critical review of mobile payment research, observed that existing research has predominantly concentrated on consumer adoption and technological aspects, while also identifying security, trust, and usability as important dimensions of mobile payment systems.

Consumer adoption has been an important theme in the Indian literature. Thakur and Srivastava (2014) examined adoption readiness, personal innovativeness, perceived risk, and usage intention for mobile payment services in India. Their findings demonstrate the importance of consumer characteristics and perceived risk in explaining mobile payment adoption. Similarly, Rathore (2016) highlighted the importance of awareness and technological familiarity in the adoption of digital payment systems. Singh et al. (2020) further examined consumer preference and satisfaction relating to mobile payment systems, reinforcing the importance of convenience and user experience in digital payment adoption.

The literature also identifies digital payments as an important mechanism for promoting financial inclusion. Narayan and Sahminan (2018) examined the relationship between financial inclusion and digital payments in developing economies and highlighted the potential of digital payment technologies to improve access to financial services. This perspective is particularly relevant to India, where the expansion of digital infrastructure has been accompanied by increasing adoption of technology-enabled financial services.

The introduction of the Unified Payments Interface (UPI) represents a major development in India's payment ecosystem. Gochhwal (2017) examined UPI as an advancement in India's payment infrastructure and highlighted its real-time, mobile-centric and interoperable architecture. The study identified UPI's potential to improve convenience, reduce transaction friction, and support wider participation in digital payments.

More recent research has increasingly examined the growth and changing structure of India's digital payment ecosystem. Nagaraja (2024) discussed the development of digital payment systems in India and the role of technological and policy developments in their expansion. Rout and Ray (2024) examined digital payment systems in relation to financial inclusion. Recent research has also focused specifically on the rapid expansion of UPI and its changing relationship with traditional payment mechanisms.

Official data provide further evidence of this structural transformation. The Reserve Bank of India reports that UPI has become the dominant retail payment mechanism in terms of transaction volume, while other systems continue to play important roles in higher-value transactions. This distinction indicates that transaction volume and transaction value capture different dimensions of the significance of a payment system. Therefore, analysing both indicators is necessary for a comprehensive assessment of India's evolving payment ecosystem.

Overall, the existing literature establishes that digital payment growth is associated with technological advancement, consumer adoption, infrastructure development, policy support, and financial inclusion. However, much of the literature concentrates on adoption behaviour, individual payment platforms, or broader financial inclusion outcomes. Comparatively less attention has been given to a focused and recent comparison of major payment systems using both transaction volume and transaction value within a common analytical framework.

## **2.1 Research Gap**

The review indicates three important gaps in the existing literature. First, a substantial proportion of previous studies focuses on consumer adoption, behavioural factors, and technological characteristics rather than aggregate payment-system trends. Second, several studies examine individual payment mechanisms, particularly UPI, rather than comparing major payment systems simultaneously. Third, relatively limited recent research examines both transaction volume and transaction value together to assess the changing relative importance of different payment instruments.

The present study addresses these gaps by comparatively analysing UPI, NEFT, RTGS, and IMPS during the period 2020–21 to 2024–25. Using secondary data, the study examines transaction volume, transaction value, annual growth, and relative dominance of the selected payment systems. The study therefore provides an updated assessment of the structural transformation of India's digital payment ecosystem and distinguishes between high-volume retail payment activity and high-value payment activity.

## **3. Scope of Study:**

The present study examines the growth and trends of selected digital payment systems in India during the period 2020–21 to 2024–25. The study focuses on four major electronic payment systems—Unified Payments Interface (UPI), National Electronic Funds Transfer (NEFT), Real Time Gross Settlement (RTGS), and Immediate Payment Service (IMPS)—which represent important retail and fund-transfer mechanisms in India.

The study is based exclusively on secondary data obtained from official sources, primarily the Reserve Bank of India (RBI). It analyses both transaction volume and transaction value to assess the growth, performance, and relative significance of the selected payment systems.

The scope is limited to descriptive and trend analysis, using measures such as transaction growth rates, percentage changes, and comparative analysis. The study does not examine consumer behaviour, determinants of digital payment adoption, regional variations, or primary survey data.

## 4. Objectives of the Study

The study aims to:

- 1) Analyse the growth and trends of selected digital payment systems in India during 2020–21 to 2024–25.
- 2) Compare the transaction volume and value of UPI, NEFT, RTGS, and IMPS during the study period.
- 3) Examine the annual growth patterns of the selected payment systems in terms of transaction volume and value.
- 4) Identify the relative significance and changing dominance of the selected payment systems based on transaction volume and value.

## 5. Research Methodology

The study follows a descriptive and comparative research design and is based entirely on secondary data collected primarily from official publications and statistical reports of the Reserve Bank of India (RBI) and other relevant government sources. The study covers a five-year period from 2020–21 to 2024–25 and focuses on four major digital payment systems in India, namely Unified Payments Interface (UPI), National Electronic Funds Transfer (NEFT), Real Time Gross Settlement (RTGS), and Immediate Payment Service (IMPS).

The analytical techniques include percentage growth, year-on-year growth, compound annual growth rate (CAGR), comparative analysis, tabulation, and graphical representation. Overall growth is calculated as  $(\text{Ending value} - \text{Beginning value}) / \text{Beginning value} \times 100$ . CAGR is calculated as  $[(\text{Ending value} / \text{Beginning value})^{(1/4)} - 1] \times 100$  because the five annual observations represent four growth intervals.

The study does not employ inferential statistical hypothesis testing. Accordingly, statements concerning growth are interpreted descriptively rather than as statistically significant effects. This distinction is important because statistical significance cannot be established from percentage growth or CAGR alone.

## 6. Data Analysis and Interpretation

### 6.1 Digital Payment Transactions by Volume

Table A: Digital Payment Transactions – Volume (in Lakhs)

| Year      | UPI          | NEFT      | RTGS     | IMPS      |
|-----------|--------------|-----------|----------|-----------|
| 2020 – 21 | 2,23,306.64  | 30,927.89 | 1,591.92 | 32,783.47 |
| 2021 – 22 | 4,59,561.30  | 40,407.29 | 2,078.39 | 46,625.25 |
| 2022 – 23 | 8,37,143.73  | 52,847.43 | 2,425.62 | 56,532.64 |
| 2023 – 24 | 13,11,294.68 | 72,639.50 | 2,700.16 | 60,053.35 |
| 2024 – 25 | 18,58,660.25 | 96,198.05 | 3,024.55 | 56,249.68 |

Source: Compiled from Reserve Bank of India (RBI) Payment System Indicators (various years).

## 6.2 Digital Payment Transactions by Value

**Table B: Digital Payment Transactions – Value (₹ Crore)**

| Year      | UPI         | NEFT        | RTGS         | IMPS      |
|-----------|-------------|-------------|--------------|-----------|
| 2020 – 21 | 41,03,658   | 2,51,30,910 | 10,55,99,849 | 29,41,500 |
| 2021 – 22 | 84,15,900   | 2,87,25,463 | 12,86,57,516 | 41,71,037 |
| 2022 – 23 | 1,39,14,932 | 3,37,19,541 | 14,99,46,286 | 55,85,441 |
| 2023 – 24 | 1,99,95,086 | 3,91,36,014 | 17,08,86,670 | 64,95,652 |
| 2024 – 25 | 2,60,56,955 | 4,44,61,464 | 20,13,87,682 | 71,39,110 |

Source: Compiled from Reserve Bank of India (RBI) Payment System Indicators (various years).

## 6.3 Trend Analysis

The volume data show a pronounced expansion in UPI, with transaction volume increasing from 223,306.64 lakh in 2020–21 to 1,858,660.25 lakh in 2024–25. NEFT also increased consistently, while RTGS remained the lowest in volume among the four systems. IMPS increased through 2023–24 but recorded a decline in volume in 2024–25.

The value data present a different pattern. RTGS remained the highest-value system throughout the study period, increasing from ₹105,599,849 crore in 2020–21 to ₹201,387,682 crore in 2024–25. NEFT remained second in value, while UPI recorded the strongest relative expansion. IMPS also recorded sustained value growth.

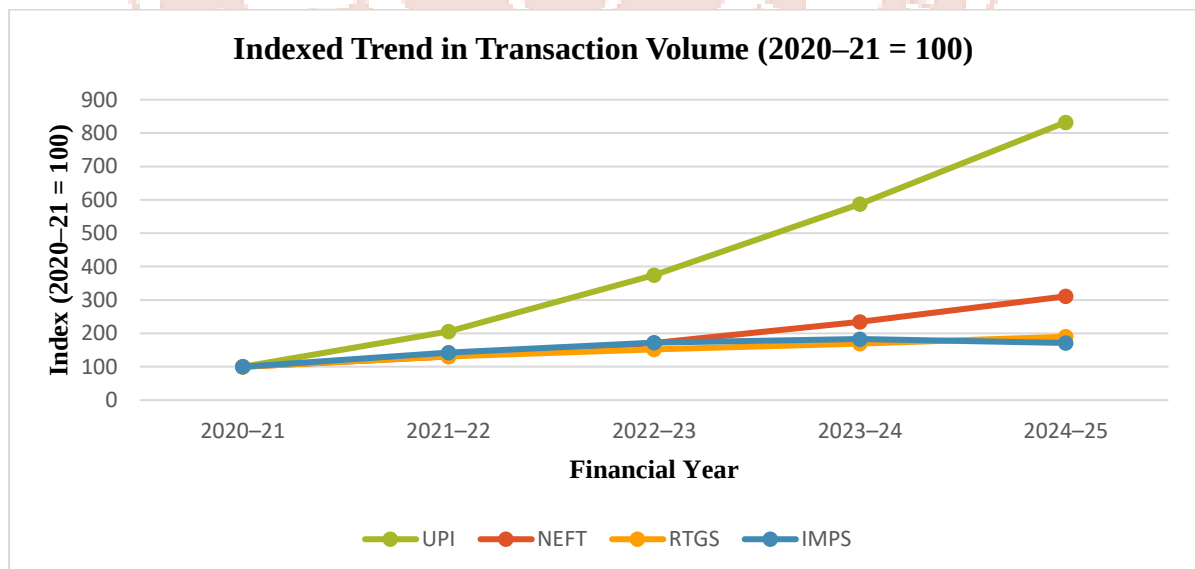


**Figure 1: Trend of Selected Digital Payment Volume**

Source: Compiled from RBI Payment System Indicators. Note: Volume is reported in lakh

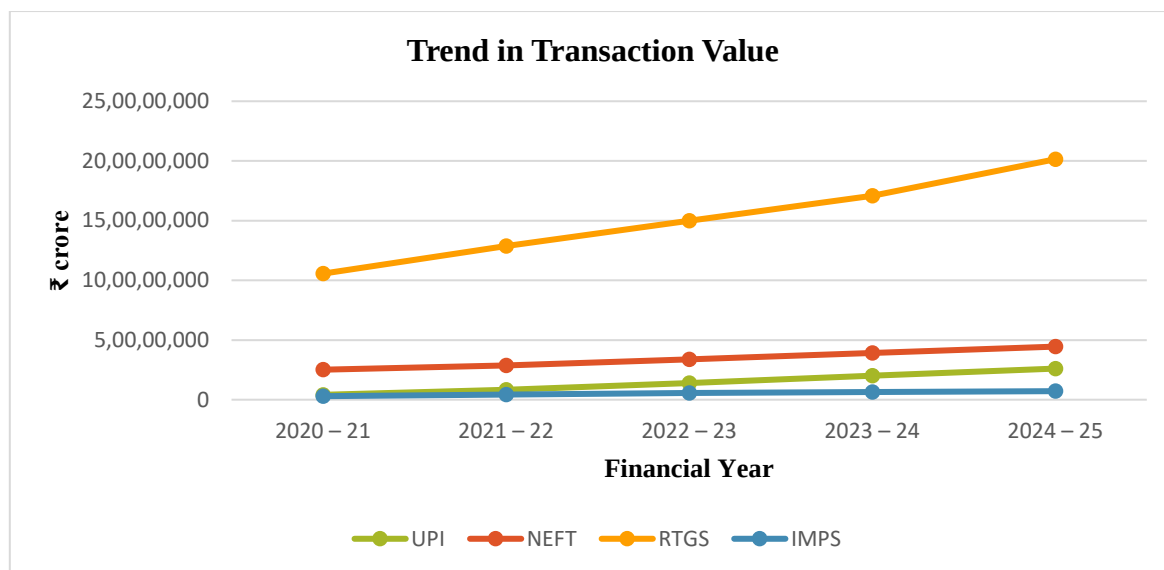


**Figure 2: Trend of Selected Digital Payment Value**

Source: Compiled from RBI Payment System Indicators. Note: Value is reported in ₹ crore.

#### 6.4 Growth Analysis

**Table 3. Overall Growth and CAGR, 2020-21 to 2024-25**

| Payment System | Volume Overall Growth | Volume CAGR | Value Overall Growth | Value CAGR |
|----------------|-----------------------|-------------|----------------------|------------|
| UPI            | 732.34%               | 69.85%      | 534.97%              | 58.74%     |
| NEFT           | 211.04%               | 32.80%      | 76.92%               | 15.33%     |
| RTGS           | 89.99%                | 17.40%      | 90.71%               | 17.51%     |
| IMPS           | 71.58%                | 14.45%      | 142.70%              | 24.82%     |

Note: Overall growth compares the first and last observations. CAGR is calculated over four annual intervals. The percentages reported here are not annual growth rates.

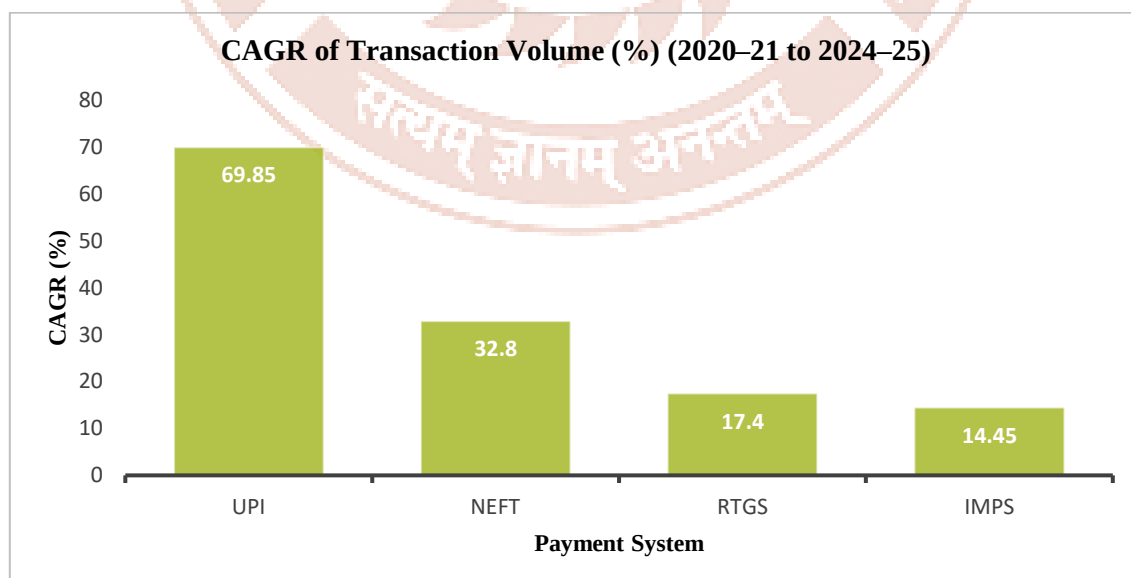


**Figure 3. CAGR of Transaction Volume (%) (2020-21 to 2024-25)**

Source: Author's calculation based on RBI Payment System Indicators.

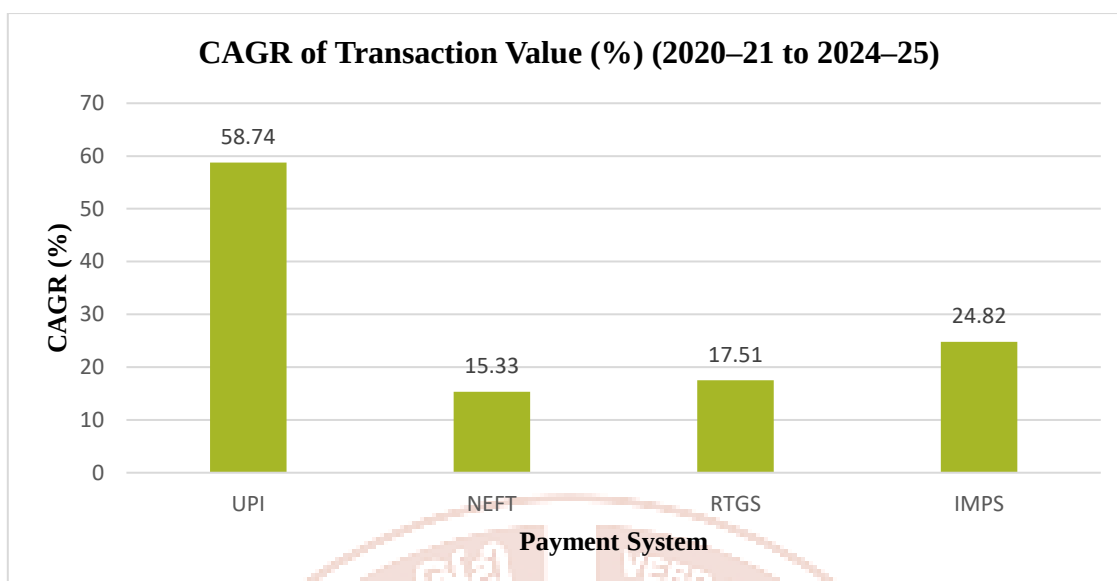


**Figure 3. CAGR of Transaction Value (%) (2020–21 to 2024–25)**

*Source: Author's calculation based on RBI Payment System Indicators.*

## 6.5 Year on Year Growth

**Table 4. Year-on-Year Growth in Transaction Volume (%)**

| Payment System | 2021–22 | 2022–23 | 2023–24 | 2024–25 |
|----------------|---------|---------|---------|---------|
| UPI            | 105.80% | 82.16%  | 56.64%  | 41.74%  |
| NEFT           | 30.65%  | 30.79%  | 37.45%  | 32.43%  |
| RTGS           | 30.53%  | 16.73%  | 11.32%  | 12.01%  |
| IMPS           | 42.22%  | 21.25%  | 6.23%   | -6.33%  |

**Table 5. Year-on-Year Growth in Transaction Value (%)**

| Payment System | 2021–22 | 2022–23 | 2023–24 | 2024–25 |
|----------------|---------|---------|---------|---------|
| UPI            | 105.08% | 65.34%  | 43.70%  | 30.32%  |
| NEFT           | 14.30%  | 17.39%  | 16.06%  | 13.61%  |
| RTGS           | 21.83%  | 16.55%  | 13.97%  | 17.85%  |
| IMPS           | 41.80%  | 33.91%  | 16.30%  | 9.91%   |

## 6.6 System-Wise Interpretation

### 6.6.1 UPI

UPI recorded the highest growth among the selected systems. Its transaction volume increased by 732.34% over the study period, corresponding to a CAGR of 69.85%. Transaction value increased by 534.97%, with a CAGR of 58.74%. The annual growth rate declined progressively from the very high growth observed in 2021–22, but the absolute volume continued to expand substantially. The results support the conclusion that UPI became the leading selected payment system by transaction volume.

### 6.6.2 NEFT

NEFT recorded sustained growth in both dimensions. Volume increased by 211.04% and value by 76.92% over the study period. Its volume CAGR of 32.80% indicates strong

expansion, although substantially below UPI. The relatively consistent annual growth suggests continued relevance of NEFT within the electronic fund-transfer infrastructure.

### **6.6.3 RTGS**

RTGS recorded the lowest transaction volume among the selected systems but the highest transaction value in every year. Volume increased by 89.99% and value by 90.71%. The result reflects the different scale and function of RTGS: a relatively small number of transactions can account for very large aggregate values. Therefore, RTGS should not be evaluated by volume alone.

### **6.6.4 IMPS**

IMPS recorded overall volume growth of 71.58% and value growth of 142.70%. Its transaction volume increased through 2023–24 before declining in 2024–25, while transaction value continued to increase. The evidence therefore supports a conclusion of moderate and differentiated growth rather than a simple decline of IMPS.

## **6.7 Comparative Analysis**

The comparative results reveal a differentiated payment ecosystem. UPI is the leading system by transaction volume and has the highest overall growth in both volume and value. RTGS is the leading system by transaction value despite its relatively low transaction count. NEFT occupies an intermediate position in both measures, while IMPS shows moderate volume growth and stronger value growth relative to its volume.

These findings demonstrate why transaction volume and transaction value should be interpreted jointly. A system that processes a very large number of transactions may nevertheless account for a smaller aggregate monetary value, whereas a high-value settlement system may process fewer transactions but account for substantially greater value.

## **7. Findings of the Study**

The analysis of digital payment systems in India during the period 2020–21 to 2024–25 leads to the following key findings:

- 1) The four selected payment systems expanded materially during 2020–21 to 2024–25, although their growth patterns differed.
- 2) UPI recorded the highest overall growth in transaction volume (732.34%) and transaction value (534.97%).
- 3) UPI emerged as the leading selected system in terms of transaction volume.
- 4) RTGS recorded the highest transaction value in every year of the study period.

- 5) NEFT recorded sustained growth in both volume and value and remained an important electronic fund-transfer mechanism.
- 6) IMPS recorded moderate overall volume growth; its volume declined in 2024–25, while its transaction value continued to increase.
- 7) The relative significance of payment systems differs according to the indicator used: UPI leads by volume, whereas RTGS leads by value.
- 8) The findings support the view that India's digital payment ecosystem consists of complementary systems serving different transactional requirements.

## 8. Conclusion

This study examined the growth and trends of UPI, NEFT, RTGS, and IMPS in India during 2020–21 to 2024–25 using secondary data from the Reserve Bank of India. The analysis of transaction volume, transaction value, annual growth, and CAGR demonstrates substantial expansion of the selected payment systems, but also reveals important differences in their scale and functional significance.

UPI emerged as the fastest-growing and largest selected system by transaction volume. RTGS, in contrast, consistently accounted for the highest transaction value, demonstrating the importance of distinguishing between transaction frequency and monetary value. NEFT continued to show sustained growth, while IMPS remained relevant despite more moderate volume growth.

The findings indicate that India's payment ecosystem is characterised not by a single system replacing all others, but by the coexistence of payment mechanisms with different roles. The study therefore contributes an updated descriptive assessment of the four selected systems and provides evidence that both transaction volume and transaction value are necessary for understanding the evolution of India's digital payment landscape.

## 9. Suggestions and Recommendations

Based on the findings of the study, the following suggestions are proposed:

- 1) Payment infrastructure should continue to be strengthened to accommodate sustained growth in digital transaction volumes.
- 2) Cybersecurity, fraud monitoring, authentication, and consumer-protection mechanisms should be continuously enhanced as digital payment usage expands.
- 3) Digital financial-literacy initiatives should continue to promote safe and informed use of digital payment channels.

- 4) Interoperability, system availability, transaction reliability, and effective grievance-redressal mechanisms should remain policy priorities.
- 5) UPI, NEFT, RTGS, and IMPS should be viewed as complementary components of the payment ecosystem, with policy attention reflecting their different functional roles.
- 6) Regular monitoring of both transaction volume and transaction value can help regulators and payment-system stakeholders identify structural changes in the payment landscape.

## **10.Limitations of the Study**

The present study, while providing meaningful insights into the growth of digital payment systems in India, is subject to certain limitations:

- 1) The study relies entirely on secondary data. Revisions to official statistics or changes in reporting definitions may affect comparability.
- 2) The study covers five financial years and therefore does not provide a long historical perspective.
- 3) Only UPI, NEFT, RTGS, and IMPS are included; other payment instruments are outside the scope.
- 4) The analysis is descriptive and comparative and does not identify causal relationships.
- 5) Consumer behaviour, demographic characteristics, merchant adoption, and regional variations are not examined.
- 6) The data are aggregated at the national level and therefore do not capture state-level or rural–urban differences.

Despite these limitations, the study provides a clear and simplified understanding of the growth and trends in digital payment systems in India.

## **11.Scope for Further Research**

Future studies may extend the analysis by incorporating cards, prepaid payment instruments, mobile wallets, and other payment channels. Longer time-series datasets could be used to examine structural changes more rigorously. Inferential and econometric techniques may be applied to investigate determinants of payment-system growth and relationships with macroeconomic and financial-development indicators. State-level, rural–urban, and cross-country comparisons may also provide deeper insights. Primary research involving consumers, merchants, and financial institutions could complement aggregate secondary-data analysis.

## References

- Dahlberg, T., Guo, J., & Ondrus, J. (2015). A critical review of mobile payment research. *Electronic Commerce Research and Applications*, 14(5), 265–284. <https://doi.org/10.1016/j.elerap.2015.07.006>
- Gochhwal, R. (2017). Unified Payment Interface—An advancement in payment systems. *American Journal of Industrial and Business Management*, 7(10), 1174–1191. <https://doi.org/10.4236/ajibm.2017.710084>
- Nagaraja, R. C. (2024). A study on digital payment system in India. *ShodhKosh: Journal of Visual and Performing Arts*, 5(1), 2754–2762. <https://doi.org/10.29121/shodhkosh.v5.i1.2024.2888>
- Narayan, P. K., & Sahminan, S. (2018). Financial inclusion and digital payments in developing economies. *Applied Economics Letters*, 25(21). <https://doi.org/10.1080/13504851.2018.1430323>
- Rathore, H. S. (2016). Adoption of digital payment system by consumers. *International Journal of Science, Technology and Management*, 5(9).
- Reserve Bank of India. (2024). Annual report 2023–24. Reserve Bank of India.
- Rout, M., & Ray, R. (2024). Analytical study of digital payment system for financial inclusion in India. *ShodhKosh: Journal of Visual and Performing Arts*, 5(2). <https://doi.org/10.29121/shodhkosh.v5.i2.2024.6327>
- Singh, N., Srivastava, S. C., & Sinha, N. (2020). Consumer preference and satisfaction of mobile payment systems. *Journal of Retailing and Consumer Services*, 55, 102079. <https://doi.org/10.1016/j.jretconser.2020.102079>
- Sumanjeet. (2009). Emergence of payment systems in the age of electronic commerce: The state of art. *Global Journal of International Business Research*, 2(2), 17–36.
- Thakur, R., & Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. *Internet Research*, 24(3), 369–392. <https://doi.org/10.1108/IntR-12-2012-0244>