International Journal of Humanities Social Science and Management (IJHSSM)
Volume 6, Issue 4, Jul. – Aug., 2026, pp: 36-43 ISSN: 3048-6874
www.ijhssm.org

Transformation of Payment Behaviour in India after Demonetization

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Date of Submission: 01-07-2026 Date of Acceptance: 11-07-2026

I. Introduction

The payment system of an economy is vital for facilitating transactions and ensuring smooth functioning of financial markets. Traditionally, India has been cash-intensive, with a strong preference for physical currency in daily transactions. The demonetization policy of November 2016 marked a turning point by creating a sudden cash shortage, compelling households, businesses, and institutions to adopt non-cash alternatives. This policy accelerated the growth of digital payments, supported by coordinated efforts of the Reserve Bank of India, the Government of India, and the National Payments Corporation of India. Platforms like Unified Payments Interface (UPI), alongside reforms such as interoperability, QR-code payments, zero merchant discount rate, and round-the-clock NEFT and RTGS, transformed payment behaviour. The COVID-19 pandemic further reinforced this shift, as mobility restrictions and health concerns increased reliance on contactless and remote payment methods. This study examines the transformation of payment behaviour in India post-demonetization by analysing trends in the volume and value of digital transactions across different payment instruments. The focus is on the structural shift from legacy systems to real-time, account-to-account platforms, highlighting the growing dominance of UPI in retail payments and the broader structural transformation of India's digital payment ecosystem.

II. Review of Literature

1. **Singh and Vikas (2022)** analysed the post-demonetisation transformation of India's digital payment systems using RBI data from 2005–06 to 2018–19, highlighting a structural shift from cash to digital modes driven by policy initiatives, rising cash-handling costs, and e-commerce growth.
2. **Walasange and Trimukhe (2023)** noted the centrality of digital payments in India's modern economy, emphasizing technological progress, internet penetration, and government support, while also pointing out infrastructure gaps, security issues, and limited user awareness.
3. **Singh and Damodar (2024)** observed regional and demographic diversification of digital payment instruments, attributing growth to policy measures, technology, and changing consumer preferences.
4. **Saifi and Khan (2024)** reported that ease of use, fast transactions, and accessible digital infrastructure significantly influenced women's adoption of digital payments, with Paytm being the most preferred platform.
5. **Huddar (2024)** highlighted COVID-19 as a major catalyst for digital adoption, with transaction volumes rising sharply during 2020–21. Katrak (2024) emphasised the evolution from traditional banking to real-time platforms like UPI and mobile wallets, noting persistent challenges including digital literacy gaps and cybersecurity risks.
6. **Pardeep Kaur and Atwal (2025)** found demonetisation significantly accelerated the shift from cash to digital modes.
7. **Koley and Nandy (2025)** documented post-demonetisation and pandemic-driven growth in UPI, IMPS, NEFT, and card payments, while noting challenges like the digital divide and regulatory complexities.
8. **Shreenivas and Basavaraj (2025)** highlighted usage patterns, emerging trends, and innovations such as vernacular and voice-based interfaces, though connectivity and infrastructure gaps remain constraints.

III. Objectives of the Study

The study aims to examine the following objectives

1. To Examine the growth trends of Digital Payments in India from 2016-17 to 2024-25
2. To analyse the changes in Volume and Value across different payment modes
3. To compare Retail payment Systems (UPI,IMPS,Cards, PPIs) with large value system (RTGS, NEFT)

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4. To Identify the structural Shifts in Indias Digital Payment Ecosystem

IV. Data Source and Methodology

The study adopts a descriptive and analytical research design based entirely on secondary data. Data are sourced from authentic and reliable publications of the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI), including annual reports, statistical bulletins, and digital payment dashboards. Trend analysis and comparative analysis are employed to examine changes in payment behaviour in the post-demonetization period in India.

V. An Overview of Digital Payment Systems in India

India's digital payment ecosystem has rapidly evolved to create a secure, efficient, and inclusive financial system. Regulatory support from the Reserve Bank of India (RBI) and operational initiatives by the National Payments Corporation of India (NPCI) have enabled the development of diverse electronic payment platforms catering to high-value transfers, retail payments, recurring transactions, and financial inclusion.

Major Payment Mechanisms:

- **RTGS:** Facilitates real-time settlement of large-value transactions, primarily used by banks and corporations due to its reliability and minimal settlement risk.
- **NEFT:** Enables fund transfers across banks in periodic cycles, suitable for routine transactions such as salaries, vendor payments, and personal transfers.
- **NACH & ECS:** Support bulk and recurring transactions like salaries, pensions, and utility payments, with NACH gradually replacing ECS for greater efficiency.
- **IMPS:** Provides instant 24×7 fund transfers via mobile and internet banking, ideal for small-value, time-sensitive payments.
- **UPI & BHIM:** Allow instant account-to-account transfers using simple identifiers, offering speed, low cost, and user-friendliness, making UPI the most widely used digital payment mode.
- **BHIM Aadhaar Pay:** Enables payments using biometric authentication, expanding digital adoption in rural and semi-urban areas.
- **Card Payments:** Debit and credit cards support secure transactions at PoS and online platforms.
- **PPIs and Wallets:** Store prepaid monetary value, used for online shopping and transport, though declining with UPI growth.
- **Intra-Bank Transfers**: Instant fund movement within the same bank, enhancing convenience for everyday banking.

Overall, these systems collectively support India's shift from cash-based transactions to a robust digital payment ecosystem.

VI. Analysis and Result

6.1 Volume and value pattern analysis

The analysis of digital transactions examines both the volume and value patterns to understand the growth, adoption, and structural transformation of India's payment ecosystem. By studying transaction volumes, we can assess how frequently digital payments are being used, while transaction values highlight the economic significance of these payments. Together, volume and value analysis provides a comprehensive view of the shift from cash-based to digital modes, the increasing dominance of platforms like UPI for retail payments, and the continued importance of large-value systems such as RTGS and NEFT.

Digital Transactions by volume

The total volume of digital transactions in India increased sharply from 49,374 lakh in 2015–16 to 21,37,863 lakh transactions in 2024–25, indicating an extraordinary expansion of the digital payments ecosystem. The growth was particularly rapid after 2018–19, reflecting the combined impact of policy initiatives, improved digital infrastructure, and rising smartphone penetration.

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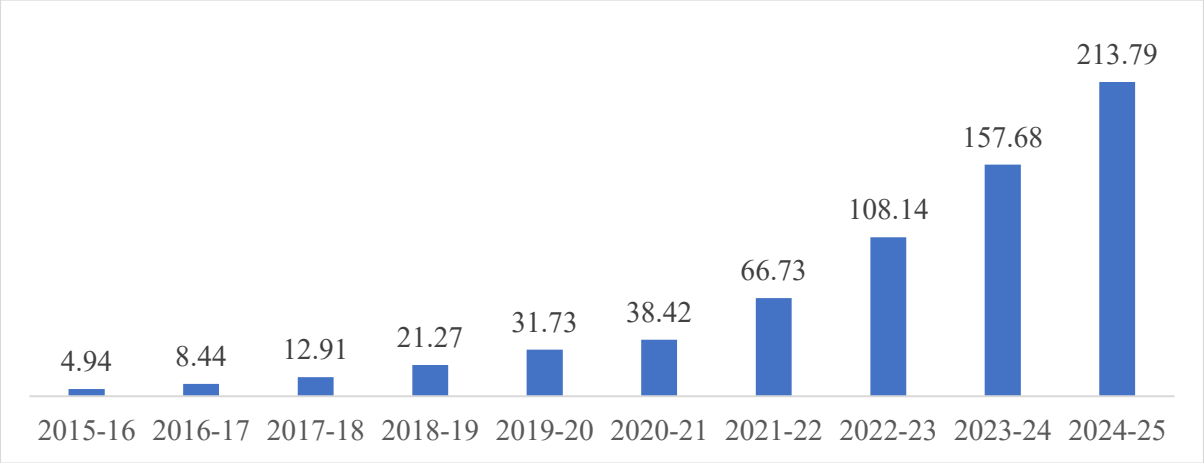
Figure 1: Volume of Digital Transactions (in billions)

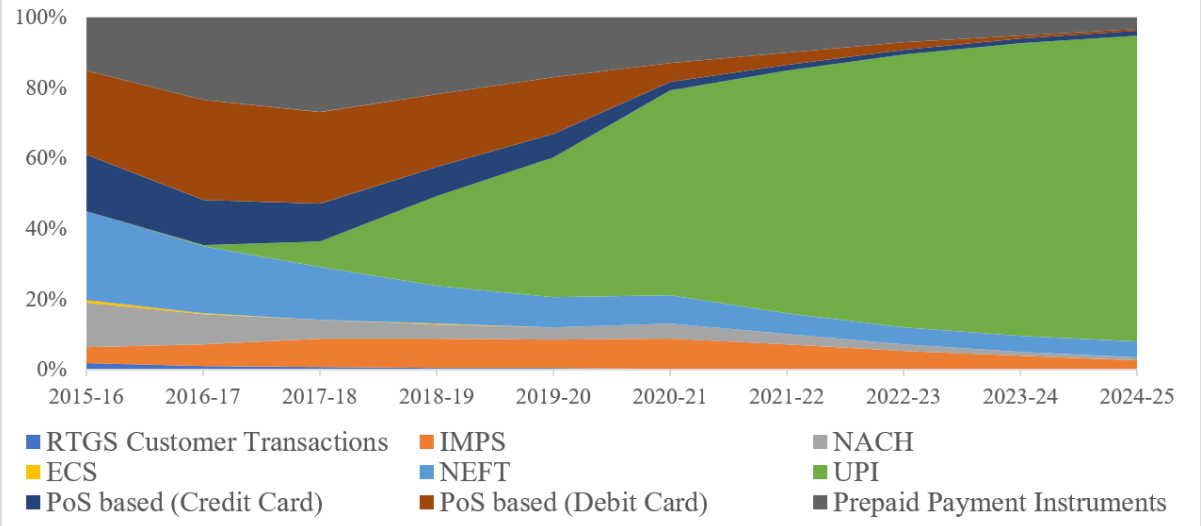


Source: Reserve Bank of India

A significant acceleration is observed during the COVID-19 period (2020–21 onwards), when digital payments became essential due to mobility restrictions and contactless payment preferences. The volume nearly tripled between 2020–21 and 2022–23, highlighting a strong behavioural shift towards digital modes of payment.

In the post-pandemic period, growth continued at a high pace, driven mainly by the widespread adoption of UPI, which transformed small-value and high-frequency transactions. Overall, the data clearly demonstrate that India's digital payment growth is not incremental but structural and transformative, marking a decisive shift away from cash-based transactions.

Figure 1: Share of Different Components in Total Volume of Digital Payments



The volume of digital payments in India has increased manifold since 2015-16, but the growth has been highly uneven across payment instruments. The period marks a structural transformation from batch-processed (ECS, NACH) and card-based systems to real-time, account-to-account systems, led overwhelmingly by UPI. The period since 2016 marks the rise of UPI as a public digital infrastructure, fundamentally reshaping digital payment behaviour. UPI has emerged as the single largest contributor to total digital transaction volume. By 2024–25, UPI accounts for 87 per cent of total digital transactions, far surpassing all other payment instruments. This reflects its ease of use, zero or low transaction cost, interoperability, and strong policy support. UPI has become the backbone of retail

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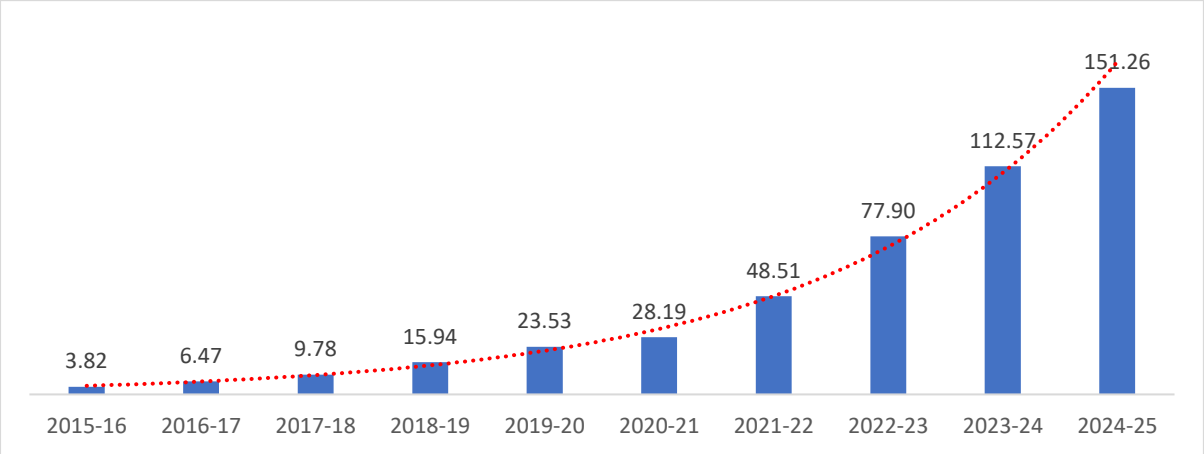
digital payments, especially for small-value, high-frequency transactions.

NEFT and IMPS remain secondary but important contributors to total digital transactions, supporting bank-to-bank and real-time retail payments alongside the dominant UPI system. Its share has declined over time due to functional overlap and substitution by UPI. As expected, RTGS customer transactions constitute a very small share in total volume, despite steady growth since as RTGS is designed for large-value transactions. NACH continues to exist but contributes only a limited share to total transactions, mainly for bulk and recurring payments such as EMIs and subsidies. Debit card transactions at PoS have witnessed a sharp decline in share, especially after 2019–20. Credit card PoS transactions show a relatively stable but small share in total volume. The declining share of card-based payments indicates substitution by UPI, particularly at merchant locations. PPIs account for a small but stable share in total digital transactions. Their growth has been constrained by regulatory norms and intense competition from UPI.

Figure 2 clearly indicates that India's digital payment ecosystem has undergone a deep structural transformation. Transaction volumes have shifted sharply from ECS, credit/ debit cards at PoS, and PPIs towards real-time, account-based systems, especially UPI. UPI has emerged as the dominant mode of retail digital payments, while IMPS and NEFT continue to play secondary but important roles. At the same time, large-value systems like RTGS and batch systems like NACH have been reoriented towards specialised and niche functions.

The per capita volume of digital payments exhibits a pronounced and sustained upward trajectory over the period 2015–16 to 2024–25, increasing from 3.82 to 151.26 (in Figure 3)

Figure 3: Digital Payments (per capita)



The initial phase (2015–16 to 2017–18) is characterized by moderate growth, reflecting the gradual adoption of digital payment instruments. From 2018–19 onwards, the growth accelerates markedly, with the period 2021–22 to 2024–25 evidencing an exponential increase, indicative of enhanced digital infrastructure, increased smartphone penetration, and supportive policy interventions promoting a cashless economy. The observed trend underscores a structural transformation in the payment ecosystem, signaling a robust shift from conventional cash transactions toward digital payment modalities at the individual level.

Digital Transactions by value

The total value of digital transactions in India increased from **₹816 lakh crore in 2015–16 to ₹2,617 lakh crore in 2024–25**, indicating a strong long-term expansion of the digital payments ecosystem in value terms. This growth reflects the increasing reliance on digital platforms not only for retail payments but also for large-value financial transactions.

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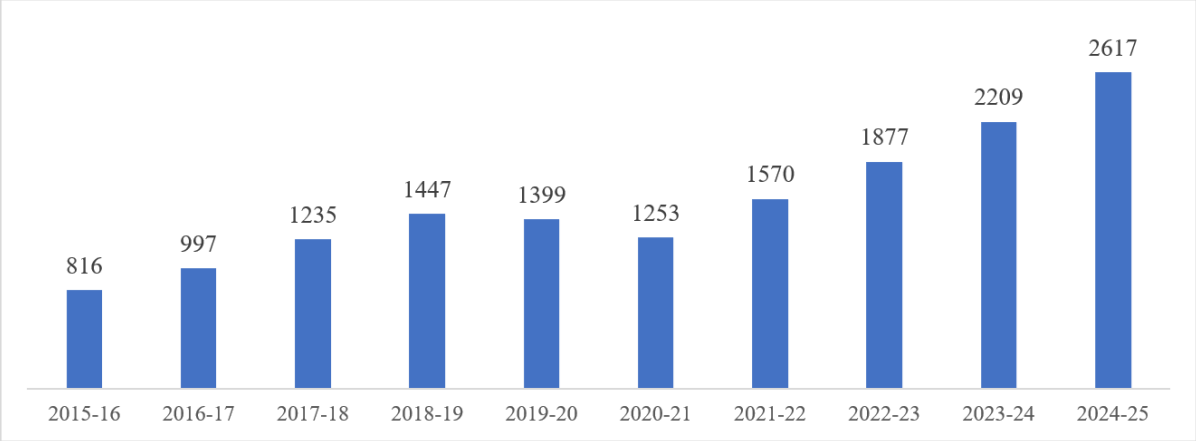
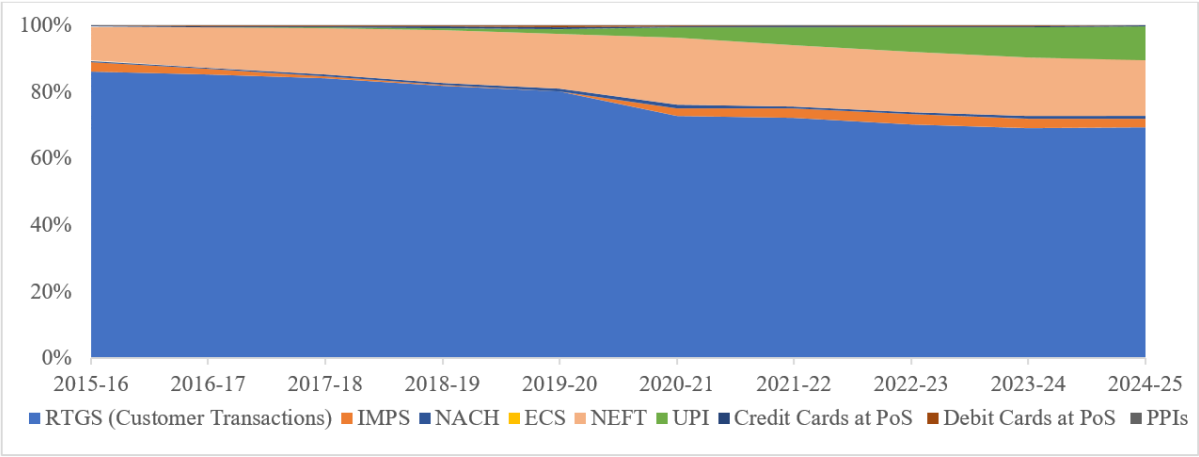
Figure 4: Value of Digital Transactions (in '00000 crores)



Source: Reserve Bank of India

A moderation and slight decline in transaction value is visible during 2019–20 and 2020–21, largely due to economic disruptions caused by the COVID-19 pandemic, which affected high-value business and investment-related payments. Despite this, the digital payments system remained resilient and recovered strongly from 2021–22 onwards.

Figure 5: Share of Different Components in Total Value of Digital Payments



The value share of digital transactions in India continues to be dominated by RTGS, reflecting its role in handling large-value payments, although its share shows a temporary dip during 2020-21 before rising strongly thereafter. NEFT shows a steady and consistent increase in value share, indicating its growing importance for medium-value retail and business transactions.

UPI, despite its explosive growth in transaction volume, accounts for a relatively small but rapidly rising share of total value, confirming that it is primarily a low-value, high-frequency payment instrument. IMPS and NACH show gradual increases in value share, highlighting their role as secondary but stable systems for instant transfers and bulk payments respectively. In contrast, card-based payments and PPIs maintain a very small and largely stagnant share in total transaction value, underscoring the shift away from cards toward account-to-account digital payment systems.

Volume and Value Compared

The volume of digital transactions grew much faster than their value, showing a sharp rise in the number of transactions but a relatively moderate increase in total value. This indicates that India's digital payments growth has been driven mainly by high-frequency, low-value transactions, especially through UPI. During the COVID years, volumes remained resilient while values slowed, highlighting

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the dominance of small retail payments over large-value transactions. Overall, the evidence suggests a deep structural transformation of India's digital payment ecosystem towards high-frequency, low-value, real-time payments anchored by UPI, with traditional systems adapting to more specialized roles.

6.2 Sequential Interventions and Structural Transformation of India's Digital Payments

The evolution of digital payment volumes in India reflects a clear sequencing of policy interventions. The volume trends in India's digital payment systems are not merely technology-driven but are deeply shaped by sequential policy interventions.

Stage 1: Demonetization (November 2016) – Initial Digital Push

Demonetization acted as a sudden shock that pushed households and merchants toward non-cash payment modes. This period saw early increases in IMPS, card payments, and the first visible usage of UPI, though overall digital volumes were still limited. The policy created awareness and basic acceptance of digital payments, setting the foundation for future growth.

Stage 2: Institutionalization of Digital Payments (2017–2019)

During this stage, the government and RBI focused on building digital payment infrastructure through UPI, BHIM, QR codes, and interoperability across banks. UPI volumes grew rapidly, while NEFT and RTGS continued steady expansion, reflecting growing confidence in formal digital systems. At the same time, ECS volumes declined, signalling the gradual move away from legacy batch-processing systems.

Stage 3: Zero MDR Policy on UPI and RuPay (2019) – Structural Break

The introduction of zero merchant discount rate (MDR) removed cost barriers for merchants and users, leading to an explosive increase in UPI transaction volumes. This policy marked a clear structural break, as UPI overtook card-based payments and IMPS in retail transactions. The data show a sharp rise in total digital volumes, driven largely by frequent, low-value UPI payments.

Stage 4: COVID-19 Pandemic (2020–21) – Acceleration Phase

The pandemic accelerated the use of digital payments as contactless transactions became essential for daily consumption. Despite economic disruption, transaction volumes remained resilient and even increased, especially through UPI. However, growth in transaction values slowed, indicating dominance of small retail payments rather than large-value transactions.

Stage 5: 24×7 NEFT and RTGS (2019–2020) – Strengthening Large-Value Systems

Reforms making NEFT and RTGS available round-the-clock strengthened their role in business and high-value transactions. While their share in total volumes remained limited compared to UPI, they continued to dominate total transaction value. This ensured stability and efficiency in large-value payments alongside rapid retail digitisation.

Stage 6: Phasing Out of ECS and Migration to NACH

ECS volumes fell sharply and were eventually phased out, with NACH emerging as the main platform for bulk and recurring payments. This transition reflects structural modernisation of payment systems rather than mere growth in volumes. NACH assumed a specialised role in handling salaries, subsidies, and recurring mandates.

Stage 7: Post-COVID Period and UPI as Digital Public Infrastructure (2022–25)

In the post-COVID phase, UPI became deeply embedded in everyday economic activity, driving massive growth in digital payment volumes. New features such as AutoPay, UPI Lite, and credit on UPI further expanded its use cases. By this stage, India's digital payment ecosystem had undergone a structural transformation, with UPI dominating volumes while legacy and bank-based systems were reoriented toward niche and high-value functions.

Overall, the stage-wise analysis demonstrates that the expansion of digital payment volumes in India is fundamentally the outcome of a carefully sequenced policy strategy rather than a spontaneous technology-led transition. Each phase of reform—ranging from the initial shock of demonetisation to the institutional consolidation of UPI as a digital public infrastructure—produced distinct shifts in the composition, scale, and functional roles of payment systems. The evidence thus confirms a deep structural transformation of India's digital payment ecosystem, characterised by the dominance of high-frequency, low-value retail transactions alongside the continued relevance of bank-based systems for large-value and specialised payment needs.

Digital transactions (by value) as percentage of GDP

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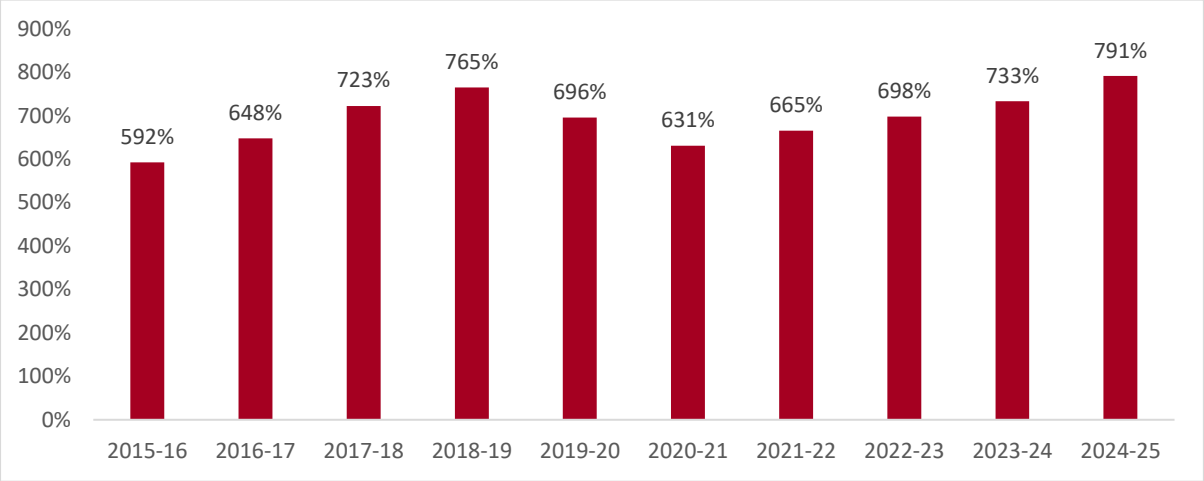
Figure 6: Digital transactions as percentage of GDP



Digital payments as a percentage of GDP show a strong upward trend, rising from 592% in 2015–16 to 791% in 2024–25, indicating rapid digitalization of the economy. The period 2015–16 to 2018–19 shows accelerated growth, reflecting the impact of demonetization and early adoption of UPI and RuPay. A dip in 2019–20 and 2020–21 corresponds to macroeconomic slowdown and the COVID-19 pandemic, which temporarily reduced transaction activity relative to GDP. From 2021–22 onwards, the share recovered steadily, driven by the Zero MDR policy, increasing merchant adoption, and convenience of low-value UPI payments. Overall, the data demonstrates that digital payments have become a dominant mode of retail transactions in India, gradually overtaking traditional banking channels.

VII. Major Findings of India's Digital Payment Transformation

1. **Rapid Growth in Transactions:** Digital transaction volume surged from 49,374 lakh (2015–16) to 21,37,863 lakh (2024–25), reflecting a structural shift rather than incremental growth.
2. **Post-2018 Acceleration & COVID-19 Impact:** Growth accelerated after 2018 and during the pandemic, driven by contactless, remote payments.
3. **UPI Dominance:** UPI accounted for 87% of transaction volume by 2024–25, replacing cards and PPIs at merchant locations.
4. **Shift to Real-Time Systems:** ECS, cards, and PPIs gave way to real-time, account-to-account platforms, with NEFT and IMPS playing supporting roles.
5. **Per Capita Penetration:** Per capita transactions rose from 3.82 to 151.26, indicating deep individual-level adoption.
6. **Value vs Volume**: High-frequency, low-value retail transactions drove growth, with digital payments as a share of GDP rising from 592% to 791%.
7. **Structural Transformation:** Policy interventions—including demonetization, UPI rollout, zero MDR, and 24×7 NEFT/RTGS—drove this irreversible shift from cash to digital payments.
8.

VIII. Policy Implications

1. **Sustain UPI as Digital Public Infrastructure:** Ensure long-term scalability, funding, and cybersecurity.
2. **Strengthen Cybersecurity & Consumer Protection**: Focus on fraud monitoring, grievance redressal, and digital literacy.
3. **Bridge the Digital Divide:** Support rural, elderly, and underserved populations with access, connectivity, and vernacular interfaces.
4. **Promote Competition & Innovation:** Encourage diversity across NEFT, IMPS, PPIs, and card systems to prevent market concentration.
5. **Support Merchants & Inclusive Growth:** Incentivize small merchants, integrate payments with welfare and MSME financing, and formalize informal economy.
6. **Monitor Systemic Risks:** Ensure stability as digital transactions grow beyond GDP multiples.

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India's digital payment growth is policy-driven and infrastructure-led, marking a long-term, irreversible shift from cash-based to digital transactions, with UPI as the backbone of retail digitization.

IX. Conclusion

The study concludes that demonetization acted as a critical catalyst in transforming payment behaviour in India, triggering a sustained shift from cash-based transactions to digital modes of payment. The evidence from 2016–17 to 2024–25 clearly demonstrates that the growth of digital payments has been structural rather than temporary, with transaction volumes expanding at an unprecedented pace. The rapid rise of UPI as the dominant retail payment instrument signifies a fundamental change in consumer and merchant behaviour, driven by ease of use, interoperability, and supportive policy measures.

The findings further reveal a clear differentiation in the roles of payment systems within India's digital ecosystem. While UPI has become the backbone of high-frequency, low-value retail transactions, large-value systems such as RTGS and NEFT continue to play a crucial role in maintaining financial system stability. The widening gap between transaction volume and value growth indicates that digitalization has been led primarily by everyday retail payments rather than large financial transfers. Overall, the study confirms an irreversible transformation of India's payment behaviour, underscoring the success of sequential policy interventions in building a resilient, inclusive, and digitally driven payment ecosystem.

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