



Digital payments in India: Benefits, Trends, Growth analysis, Challenges and future prospects –A Descriptive Study

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Abstract

The digital payments in India plays a crucial role in driving economic growth by facilitating an efficient and reliable payment system that meets the needs of businesses, government institutions, and the general public. Over the past decade, digital banking platforms and electronic payment systems have significantly transformed the financial transaction landscape by enhancing efficiency, transparency, and financial inclusion. The data have been sourced from statistical publications and annual reports of the Reserve Bank of India (RBI) and transaction statistics published by the National Payments Corporation of India (NPCI). The study employs Compound Annual Growth Rate (CAGR) and trend analysis techniques to evaluate the structural transformation of digital banking, with special reference to the Unified Payments Interface (UPI).The findings reveal a substantial acceleration in both the volume and value of digital transactions, particularly through UPI.The study also highlights various modes of digital payments and identifies key challenges affecting the sustainability and inclusiveness of digital banking in India.

Keywords: Digital Banking, Digital Payments, UPI, CAGR, financial inclusion

1. INTRODUCTION:

In the last decade, India has witnessed a remarkable shift in the way financial transactions are carried out. Payments that were once done largely in cash are now increasingly being done through mobile apps, QR codes, and online platforms. This move towards digital payments has not happened overnight it is the result of several changes in government policies, technological progress, and changing consumer habits.

One of the turning points was the 2016 demonetization, when cash availability suddenly reduced, and people had no option but to try digital modes. Although there was initial hesitation, this step made many individuals and businesses aware of the convenience of cashless payments. Later, the government's Digital India campaign and various financial inclusion schemes further encouraged people to open bank accounts, link Aadhaar numbers, and use mobile-based payment options.

Another major driver has been technology. The launch of the Unified Payments Interface (UPI) by the National Payments Corporation of India (NPCI) made digital transfers simple, instant, and free of cost. Unlike earlier online banking methods that were sometimes slow and complicated, UPI only requires a Smartphone and internet connection. This has changed how people pay for even the smallest of transactions, from buying vegetables at a local market to paying electricity bills.

India's progress in digital payments has also attracted international attention. Reports by the Reserve Bank of India (RBI) and the National Payments Corporation of India (NPCI) show that the country now handles one of the highest numbers of digital transactions in the world. However, this success story also comes with challenges. Issues such as cyber fraud, data privacy risks, limited digital literacy, and weak internet connectivity in rural areas continue to create barriers.

Looking at these developments, it becomes important to carefully study how digital payments have grown over time. Understanding the growth trends helps in knowing whether this shift is temporary or permanent, and what kind of future policies and infrastructure will be needed to support it. With this background, the present paper focuses on analyzing the trends and growth of digital payments in India between 2017-18 and 2024-25. It also highlights the major challenges that need attention and discusses the opportunities that digital payments create for financial inclusion and economic growth.

2. REVIEW OF LITERATURE:

According to Wang and Zhang (2025) accentuated that how insufficient digital infrastructure system in economy underwrites to financial exclusion especially in rural zones. Technological comfiness especially in rural regions have emerged as significant barriers to the widespread adoption of digital payments in India. Similarly, Dhore et al. (2023) stated that while urban canters are rapidly embracing digital payments, rural adoption is hampered by meagre internet connectivity and low-tech gadget penetration. Verma and Kumaran (2021) also stated that digital transformation in government services must be supported by secure and resilient infrastructures to build trust among citizens but again major concern in digital payment is cybersecurity.

Hussain et al. (2024) conducted a study which revealing that Indian user apprehension, perceived risk, and digital illiteracy among population are key factors inhibiting digital payment system adoption.

Kamal and Ahmad (2025) emphasized that organizations must adopt strategic approaches to navigate digital disruption, including behavioural change initiatives. However, in pandemic period observed shift in user behaviour from traditional to digital. Behavioural endurance and lack of awareness about digital transaction are also critical inhibitors for adoption. **Singh and Malik (2022)** observed that the crisis served as a catalyst for mainstreaming digital financial transactions. However, many users adopted digital modes out of necessity rather than preference, raising concerns about the sustainability of such shifts in the post-pandemic era.

Choudhury et al. (2025) discussed the broader implications of fintech advancements, emphasizing the growing gap between traditional banking systems and agile fintech firms in India. Regulatory apparatuses must adapt therefore to ensure financial inclusion without compromising environment systemic stability.

Malhotra et al. (2024) discuss that the absence of a strong grievance redressal apparatus, which depresses handlers from espousing online payment modes. According to Kumar & Reddy (2023), the combination of blockchain technology and artificial intelligence (AI) has the potential to simplify digital transactions and enhance security

Agarwal et al. (2020) explained that how fintech keys are driving towards financial inclusion by offering various accessible services, but this inclusion is often superficial in rural areas where digital literacy and trust in technology remain low.

Dhore et al. (2023) stated in study that small, medium enterprises have prospective addressees of digital payment platforms in India but challenges related to transaction fees, integration costs, and lack of technical expertise create hurdle in their progress.

Kumar and Shukla (2023) identified that there's potential of multimedia and innovative technologies has supporting green banking initiatives in India

According to Tripathi & Rao (2023), regulatory reforms such as enforcing Know Your Customer (KYC) standards and requiring tokenization for card transactions have significantly reduced the risk of fraud. Agarwal & Das (2024) survey that the traditions in which corporations among traditional banks and fintech companies augmented customer service and gratification. In spite of their speedy extension and enlargement, digital transactions are delayed by matters like financial fraud, data secrecy concerns, and cybersecurity threats (Chatterjee & Gupta, 2022).

According to studies (Agarwal et al., 2023), a lack of digital literacy and resistance to technology adoption in rural areas are significant obstacles. It is difficult to make digital payments in remote areas due to the need for internet connectivity (Patil & Sharma, 2024). According to Nair & Bose's research (2023), phishing and identity holdup are becoming gradually communal methods of cybercrime in the electronic payment industry. **A study by Kumar & Sinha (2022)** emphasizes the role of demonetization in accelerating digital payment adoption, revealing that cashless transactions increased by over 150% post-2016.

A report by Jain and Mehra emphasizes the significance of real-time payment systems in enhancing financial inclusion and lowering transaction costs. Government-backed initiatives like the Pradhan Mantri Jan Dhan Yojana (PMJDY) and the Digital India campaign have significantly increased digital payment adoption (Mehta, 2021). Bose (2022) says that the Payment and Settlement Systems Act, among the RBI's supervisory guidelines, has a certified, protected, and unified transaction and operation ecosystem, making e-payment or transaction more reliable.

An opportunity for financial inclusion exists in the introduction of mobile banking and FinTech-based digital financial services to underserved rural areas (Rao, 2023). The outline of the Central Bank Digital Currency (CBDC) provided by the RBI further adds new dimensions to digital payments (Das, 2024). According to Rajan and Khanna (2023), open banking APIs will inspire invention by enabling seamless incorporation between banks and third-party payment providers. According to a study by Sen and Roy (2024) state that machine learning algorithms can be used to manage risk and detect fraud in real-time transactions.

According to studies (Singh & Kumar, 2020), there has been a significant rise in digital payments as a result of increased smartphone usage and improved financial literacy. The Unified Payments Interface (UPI) has emerged as a dominant digital payment mode, with transaction volumes surpassing traditional banking channels (RBI, 2023). The surge in UPI transactions, fuelled by its interoperability and ease of use, is highlighted by Sharma et al. (2021) research. financial system.

3. RESEARCH METHODOLOGY : This paper employs a descriptive and analytical research Design to examine the trends, growth, and future prospects of digital payments in India. The study is based on secondary data, as its objectives are centered on analyzing existing, officially published figures rather than collecting new primary data.

4. OBJECTIVES OF THE STUDY:

1. To analyze the year-wise growth in total digital payment volumes and values in India from FY 2017-18 to FY 2024-25
2. To Study the growth of UPI transactions separately in terms of both volume and value during the same period.
3. To Analyze the benefits of digital payments in India.
4. To identify the major challenges faced by the digital payments in India
5. To study the future expansion of digital payments in India.

5.SOURCES OF DATA:

The study is based entirely on secondary data collected from authentic and publicly available institutional sources. The data sources include:

- Publications and statistical databases of the Reserve Bank of India (RBI).
- Transaction statistics and annual reports of the National Payments Corporation of India (NPCI)
- Reports and policy documents of the Ministry of Finance, Government of India.
- Scholarly articles from Scopus and Google Scholar
- Industry whitepapers and handbooks (e.g., PwC, McKinsey, World lines and NITI Aayog)
- Press releases and fact sheets from the Press Information Bureau (PIB).

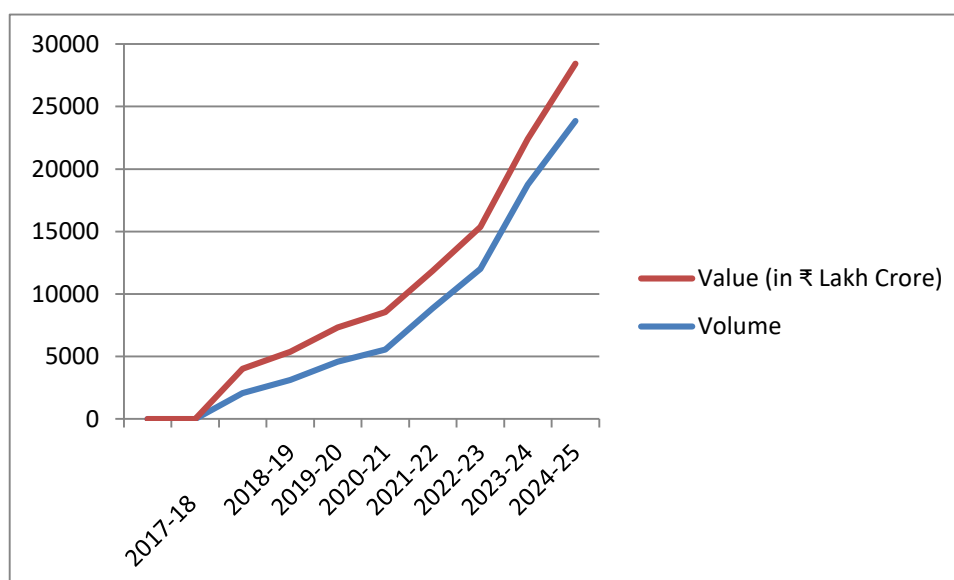
6. DATA COLLECTION PERIOD:

The data was collected for the financial years ranging from 2017-18 to 2024-25, providing a comprehensive and up-to date analysis of the eight-year growth trajectory.

The number of digital payment transactions during the last eight years and current year are as below:
Table :1

Financial Year	Volume (in Crore)	Value (in ₹ Lakh Crore)
2017-18	2,070.84	1,962
2018-19	3,134.36	2,231
2019-20	4,571.76	2,742
2020-21	5,554.33	3,000
2021-22	8,848.29	3,021
2022-23	12,008.75	3,355
2023-24	18,737.45	3,659
2024-25	23,834.38	4,580

Source: Reserve Bank of India (RBI), and Ministry of finance reports as on March31st ,2025

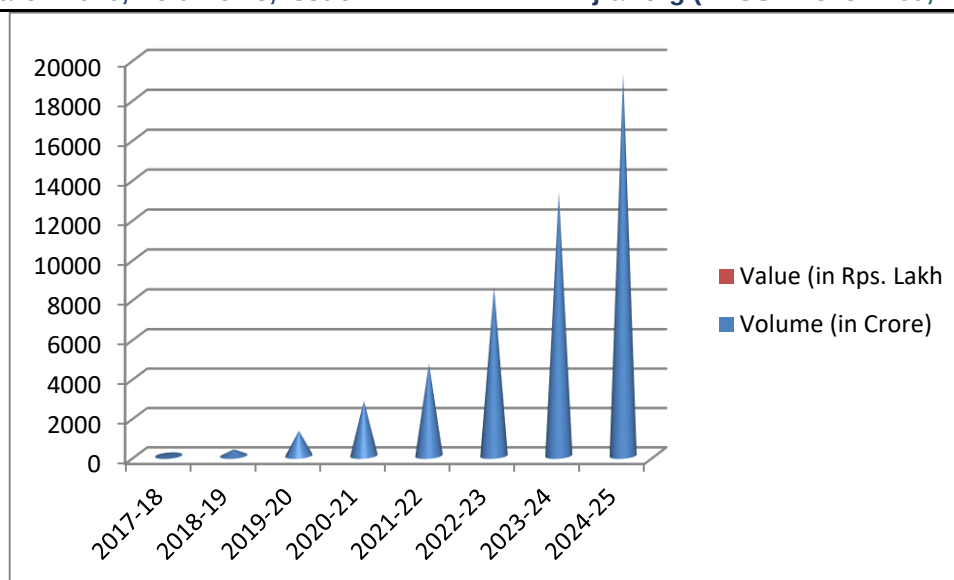


As shown in Table 1 and Figure 1 the total volume of digital payment transactions in India grew from 2,070.84 crore in FY 2017-18 to a remarkable 23,834.38 crore in FY 2024-25. The value of these transactions also witnessed robust growth, increasing from Rs.1,962 lakh crore to Rs. 4,580 lakh crore during the same period. This exponential growth is a direct result of several factors, including government initiatives, enhanced digital infrastructure, and a growing population of internet users.

Table 2: UPI Transaction Growth in India

Financial Year	Volume (in Crore)	Value (in Rps. Lakh)
2017-18	92	1
2018-19	313	5.3
2019-20	1,246	21.3
2020-21	2,732	49.3
2021-22	4,597	84.7
2022-23	8,411	139.1
2023-24	13,116	200
2024-25	19,035	233

Source: National Payments Corporation of India (NPCI) and official reports (data as of March 31, 2025).



The data in Table 2 and Figure 2 highlights UPI's explosive growth. From just 92 crore transactions in FY 2017-18, UPI volume skyrocketed to 19,035 crore by FY 2024-25. Similarly, the transaction value grew from Rs. 1 lakh crore to Rs. 233 lakh crore in the same period. This indicates that while UPI has become a platform for high-value transactions, its true strength lies in its high-volume, low value use cases for daily commerce.

7. Benefits of Digital Payments: Some of the key advantages of digital payment in India that have made them a preferred choice for transactions are:

1. Faster Payments: Digital payments allow immediate transactions that can be processed immediately, reducing the waiting time that one has to go through with traditional payment methods. This makes transactions seem smooth and efficient.

2. Convenience in the Payment Procedure: Digital payments enable swift and hassle-free transactions from your devices, eliminating the need for physical presence or documents. Whether you're paying bills, shopping online, or transferring funds, digital payment methods offer a user-friendly experience that saves both time and effort.

3. Better Payment Security: Digital payment systems use encryption and system authentication protocols, which minimize the risk of unauthorized access and effectively prevent fraud. Your financial information is protected, keeping you stress-free throughout the entire process of making digital payments.

4. Improved Efficiency: Automation and digitization in payment processes have significantly enhanced operational efficiency. By minimizing manual intervention, errors are reduced, and financial workflows are streamlined, resulting in a more efficient and error-free system.

5. Digital Record of Transactions: Digital payments provide a traceable account of transactions, thereby guaranteeing safety. Such efficiency and credibility allow individuals and businesses to maintain accurate financial records. It is easy to monitor the payment history and can be referred to when required.

6. Reduced Costs: The digital payment framework eliminates the requirement of physical infrastructure, paperwork, and manual handling. This reduces the cost of transactions for business enterprises and financial institutions. Also, digital transactions usually include a lower cost of transfer as compared to traditional banking methods.

7. Ease of Use: The payment systems facilitate customer comfort. The old cash-processing machines that could only recognize clear notes and coins are being replaced by ATMs, which are accessible and easy to use. Digital payment systems are easy to operate and will not take additional effort to understand how they work.

8. Low Fees: Digital payment methods typically entail lower transaction fees compared to banking methods, contributing to overall cost efficiency.

9. Boost Revenue: Merchants can benefit from a wider consumer base and better cash flow by utilizing digital payment methods, leading to higher revenue. Digital payments offer an efficient system, leading to higher customer satisfaction and smoother transactions, which can attract more customers in the future.

10. Discounts and Savings: Many online platforms provide discounts, cash back, or loyalty programmes. These discounts motivate the customers to go for the digital payment option, which saves them money and provides several benefits.

11. Low Risk of Theft: Digital payments diminish the possibility of the actual loss of money since it's not physical. Transactions occur in the digital world, therefore rendering the necessity of holding large amounts of currency physically unnecessary. This safeguards payments by preventing direct cash transactions and ensuring their protection.

12. Customer Management: Digital payment systems can frequently oversee and monitor the customers' transactions, preferences, and feedback, which gives the business more control over these aspects. This improves overall customer management by adjusting service offerings based on customer behavior.

13. Better Customer Experience: The ease and convenience offered by digital payments enable customers to enjoy superior service, thereby enhancing their experience. Simplified payment processes result in increased customer satisfaction and a greater likelihood of future collaboration with the business.

14. Efficient Record-Keeping Features: Through the digital infrastructure, digital payments for offline businesses are recorded efficiently; thus, the business environment is friendlier than before. Today businesses and individuals can easily track, control, and analyse their financial activities to obtain financial transparency and improve the financial management process. A critical financial metric for D2C and e-commerce businesses to track is their customer acquisition cost (CAC), which is essential for ensuring long-term profitability.

8. CHALLENGES AND FUTURE PROSPECTS

While India has emerged as a global leader in the digital payments landscape, its journey toward a fully cashless economy is not without challenges. Addressing these obstacles and capitalizing on future opportunities will be critical for sustained growth and deeper financial inclusion.

Challenges to Sustained Growth

Despite the widespread adoption of digital payments, a number of key challenges persist, particularly in reaching the last mile of the population.

- **Digital Literacy and Cyber security:** A significant portion of the population, especially in rural and semi urban areas, lacks the digital and financial literacy to use digital payment platforms safely and confidently. This vulnerability is a major cause of concern, as it makes users susceptible to phishing scams, cyber fraud, and other forms of security breaches. Ensuring robust customer protection and building user trust remains a paramount challenge.

- **Infrastructure Gaps:** Consistent and high-speed internet connectivity is the backbone of the digital payments ecosystem. However, unreliable or slow internet in remote regions and Tier-3 cities can lead to transaction failures, which erode user confidence and limit the reach of digital platforms.

- **Persistent Preference for Cash:** While digital transaction volumes have grown exponentially, cash remains a dominant mode of payment for a large segment of the population. This is driven by longstanding habits, a desire for anonymity, and a lack of trust in digital systems, especially for larger transactions.

- **Regulatory Complexity:** As the fintech landscape evolves, there is a constant need for a balanced regulatory framework that fosters innovation while ensuring customer safety and system stability. Issues like data privacy, cross-border payment regulations, and evolving business models for fintechs continue to pose a challenge.

9. The future of digital payments in India: In line with the market predictions, digital payments in India have been up for an accelerated, sustained and robust growth since the last decade, fostering innovation in product propositions for end customers, solutions for merchants and ever-evolving regulations. The next phase of digital payments could see the introduction of new payment use cases, more focus on sustainable margins, opening of new markets and regulatory interventions.

a) Credit penetration and availability: India has seen a recent surge in credit penetration. Number of individuals availing of credit facilities has grown substantially, driven by an awareness of financial products and services. This uptick in credit usage has targeted various sectors including retail loans, SME financing and agricultural credit.

b) Increasing credit awareness: Customers have increasingly become self-aware about tracking their debts and looking for available credit opportunities. Typically, credit monitoring is done to obtain new credit products, to better manage debts and to improve credit score. The increase in credit awareness and monitoring can lead to an efficient and growing lending market.

c) Payment aggregator for cross border: On 31 October 2023, the RBI issued guidelines for cross-border payment aggregators thereby allowing non-bank entities to enter the payment aggregation business, expanding their scope to include the import of services.

d) Interoperability of net banking: The RBI is set to introduce interoperability for internet banking transactions, with an expected rollout in the current year. Currently, banks have to individually integrate with each PA used by different online merchants, which is a complex and cumbersome process given the numerous PAs in the market. Moreover, the absence of a unified payment system and standardized rules leads to delays in merchants receiving payments and increases settlement risks.

The initiative of interoperability in the net banking system will reduce integration requirements and enable faster go-to-market, streamline payment processes, resulting in faster settlements for merchants and enhancing user experience. It will reduce operational complexities for banks and PAs, fostering a more competitive and inclusive financial ecosystem. This move is expected to mitigate settlement risks, drive innovation in the payment sector and lower platform and usage charges.

e) Central Bank Digital Currency (CBDC): The introduction of the digital rupee (₹) by the Reserve Bank of India presents an opportunity to create a more efficient and secure form of digital cash. This can complement the existing payment infrastructure and further reduce the reliance on physical currency.

10. Conclusion The analysis of digital payment trends in India from FY 2017-18 to FY 2024-25 reveals a powerful story of financial revolution. The findings demonstrate that digital payments, led by the Unified Payments Interface (UPI), have evolved from a niche service to the backbone of the country's economic activity. The exponential growth in transaction volume, significantly outpacing the growth in value, stands as a testament to a fundamental shift in consumer behavior, where digital platforms are now trusted for even the most basic, daily transactions. The growth of digital banking in India, with reference to the Unified Payments Interface (UPI), represents a pivotal milestone in the nation's economic transformation over the last decade. UPI dominates Indian digital payment market holding over 80% share. The growth analysis of both volume and value of digital payment and UPI over five years revealed that the number of transactions using UPI is increased day by day as compared to the value. This shift from a specialized service to an essential aspect of daily financial transactions highlights a profound change in consumer behavior, characterized by an increased trust in digital platforms. Such progress not only showcases the resilience and adaptability of Indian consumers but also reflects the success of Government initiatives and technological advancements in cultivating a modern financial ecosystem. Driven by interoperability, ease of use, real-time settlement, and strong regulatory support, UPI successfully bridged gaps in financial inclusion and accelerated the migration from cash to digital transactions. Despite these advancements, the journey towards comprehensive digital banking is not without its challenges. Concerns surrounding cyber security, along with issues of digital and financial illiteracy and existing infrastructure gaps, pose significant obstacles that must be addressed to ensure sustainable growth and equitable access to digital payment systems for all citizens. Nevertheless, the impressive uptake of digital payment solutions underscores India's potential to emerge as a leader in the global digital finance landscape. The analysis of UPI as the dominant transaction platform reinforces the promise of a digitally connected financial future for India.

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