

Implications of COVID-19 on Digital Payment Services in India: Growth, Trends and Future Prospects

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Abstract: Digital payment allows a monetary transaction to be completed between two or more parties on an online platform, without the physical exchange of currency, at any hour and from any location. This paper examines the implications of the COVID-19 pandemic for digital payment services in India and the trajectory of growth that followed. The study is based on secondary data drawn from the Reserve Bank of India, the National Payments Corporation of India, the Ministry of Electronics and Information Technology and published research. It finds that the total volume of digital payment transactions rose from 20.71 billion in FY 2017-18 to 222.6 billion in FY 2024-25, that the Unified Payments Interface accounted for 83.4 per cent of ecosystem volume by FY 2024-25, and that the pandemic acted as a decisive accelerant by making contactless payment a matter of public health rather than convenience. Cyber-security risk, the rural-urban infrastructure divide and limited digital literacy remain the principal constraints on equitable adoption.

Keywords: Digital payment services, COVID-19, Unified Payments Interface, contactless payment, financial inclusion, fintech, Digital India.

I. INTRODUCTION

The past decade has seen unprecedented growth in the adoption of digital payment systems in India. With the proliferation of smartphones, the spread of internet connectivity and government initiatives such as Digital India and the Pradhan Mantri Jan Dhan Yojana, the Indian economy has moved rapidly from a cash-intensive transaction system towards a digital framework. The launch of the Unified Payments Interface (UPI) in 2016 marked a pivotal moment, transforming both peer-to-peer and business-to-customer payments across urban and rural India [1].

The term digital payment refers to the transfer of a sum of money through a mobile application or website, at any hour and from any location, in which funds move directly from the payer's bank account to the payee's without a physical transaction between the parties. Governments across the world promote such services because of the benefits that follow from them: a complete record of monetary transactions, reduced dependence on the physical handling of cash, and protection of the public against theft or loss of money.

The concept began to flourish in India in 2016 with the Digital India mission, which encouraged businesses and citizens to adopt digital technology in order to strengthen the economy through paperless, faceless and cashless transactions. In 2020, when the country faced the severe consequences of the coronavirus, a large proportion of the population began paying for essential purchases digitally in order to avoid physical contact, whether in cities, towns or villages. An individual may transact through a bank's own mobile application or through a third-party application such as Amazon Pay, Google Pay, PhonePe or Paytm, in each case linking a bank account to the application or loading a digital wallet.

COVID-19 had an adverse effect on most industries worldwide, including retail, fashion, hospitality and aviation. It simultaneously boosted the use of digital payment in particular activities, such as buying groceries and medicines online and subscribing to over-the-top entertainment channels, in compliance with rules on social distancing and the reduced circulation of cash. Many shopkeepers adopted digital payment in order to continue making sales, and e-commerce platforms such as Amazon and messaging applications such as WhatsApp began offering payment services to the general public.

Digital payment services offered the public substantial benefits during this period and became a necessity rather than a convenience. Transacting digitally helped society maintain social distance and reduced the risk of contact with infection. Cashbacks and shopping vouchers encouraged wider use. In towns and villages where buying and selling necessities in cash had become difficult, digital payment allowed sellers to continue trading and to receive money directly into their bank accounts, which also relieved them of the need to deposit cash at a time when branches were closed. Payments

could be made from a distance, without regard to the location of either party, which proved valuable for settling electricity bills, fuel purchases, school and college fees and house rent, and for maintaining regular investments.

II. LITERATURE REVIEW

Franciska and Sahayaselvi [2] reviewed books, articles, journals and related sources to trace the progress of digital payment, clarifying the different forms of transfer used by ordinary people in daily life. They reported that mobile banking transactions rose sharply between 2012-13 and 2015-16, and that the extension of mobile networks, internet access and electricity was carrying digital payment into rural regions. They concluded that cashless exchange is not only superior to cash exchange but also less time-consuming, and that the transaction method of the future is therefore a cashless one.

Vally and Divya [3], studying digital payments in India from the perspective of consumer adoption, observed that digital payment services gained sharply after demonetisation, which gave rise to the BHIM and UPI applications and to greater transparency. From a primary survey of 183 respondents in the Hyderabad region analysed by the chi-square technique, they found that technological deployment had improved banking performance in a manner competent to attain the objective of a cashless economy, and that banks must take effective measures to create awareness about security and technology.

Thirupathi, Vinayagamoorthi and Mathiraj [4], in a case study of the effect of cashless payment methods, noted that financial institutions and banks are being linked to digital payment systems daily, and that this linkage assists the government in pursuing economic growth. They observed that electronic payment then accounted for less than five per cent of the total and that about 26 per cent of the population had internet access. They further found that banks were offering discounts on card payments and attractive offers on digital wallets in order to build the habit of digital payment, and were making their largest investments in mobile payment systems alongside initiatives in online and mobile banking. Sudha, Sornaganesh, Thangajesu Satish and Chellama [5] examined the digital payment mechanisms used during the pandemic on the basis of primary data gathered from 220 respondents, situating their analysis within the Digital India programme, whose vision is to turn India into a digital society and knowledge economy. They noted the Reserve Bank of India's stated intention to raise digital transactions to about fifteen per cent of gross domestic product, and the government's aim of a billion digital transactions a day in the world's fastest-growing mobile market.

Singhal [6] argued that banking services offered in digital form create opportunities for banks in serving their customers, and that consumers hold a favourable impression of digital payment services. She found that the Reserve Bank of India and the government had introduced notable measures, including deferred payment arrangements outside the conventional financial system, and that continuous improvement in transmission and innovation had stimulated voluntary adoption of computerised instalments. She also identified demonetisation and the Goods and Services Tax as governmental interventions contributing to economic expansion.

Jain, Sarupria and Kothari [7] analysed the impact of COVID-19 on e-wallet payments in the Indian economy and observed a marked rise in wallet-based transactions during the lockdown, attributing the shift to consumers' preference for avoiding the physical handling of currency.

A. Research Gap

Most of the reviewed studies were written before or during the early phase of the pandemic and could therefore assess its effect only as it unfolded. Several rely on projections rather than realised data. With the transaction record for the financial years from 2020-21 to 2024-25 now published by the Reserve Bank of India and the National Payments Corporation of India, it is possible to measure the pandemic's effect against the subsequent trajectory rather than to anticipate it. The present study undertakes that assessment.

III. OBJECTIVES OF THE STUDY

1. To study the growth trend of digital payment systems in India over the last decade.
2. To analyse the key factors shaping the growth of digital payment systems in India.
3. To review the challenges and future prospects associated with the transformation of India's digital payment ecosystem.

IV. RESEARCH METHODOLOGY

Nature of the study. The study is descriptive and analytical in design and is based entirely on secondary data.

Sources of data. Data were compiled from the Reserve Bank of India Annual Report and Payment System Indicators, the National Payments Corporation of India UPI product statistics, press releases of the Ministry of Finance and the Ministry of Electronics and Information Technology, industry reports, and previously published articles and journals.

Period of study. The analysis covers the financial years 2017-18 to 2024-25, with reference to FY 2025-26 where published figures are available. This period was selected because a continuous and officially reported transaction series exists from FY 2017-18 onward, which permits consistent year-on-year comparison across the pre-pandemic, pandemic and post-pandemic phases.

Tools of analysis. The data were analysed using trend analysis, year-on-year growth rates, compound annual growth rate and percentage share, and are presented in tabular and graphical form.

A. Scope and Limitations

The scope of the study is confined to the growth, composition and constraints of digital payment services in India at the national level. Because the study rests wholly on secondary data, it inherits the definitional boundaries and reporting conventions of the compiling agencies, and aggregate transaction counts do not distinguish between transaction types or user segments. The findings would be strengthened by primary data gathered through a first-hand survey of users and merchants, and by state-level disaggregation, neither of which was undertaken here.

V. GROWTH OF DIGITAL PAYMENTS IN INDIA

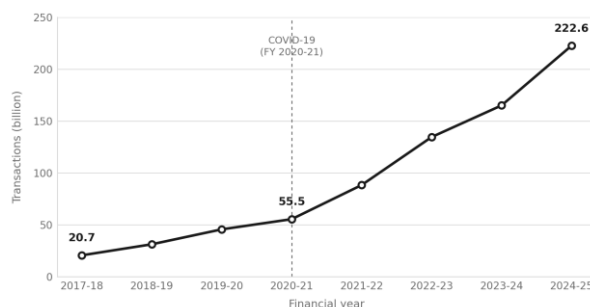
What began as a cash-dominated economy has become one of the world's largest digital payment markets. Following the introduction of UPI in 2016 and a series of initiatives under Digital India, the payment infrastructure expanded rapidly. According to figures reported by the Ministry of Finance and the Reserve Bank of India, the total volume of digital payment transactions rose from 2,071 crore in FY 2017-18 to 13,462 crore in FY 2022-23, a compound annual growth rate of about 45 per cent [8], and reached 22,260 crore in FY 2024-25 [9].

Table 1: Growth of Digital Payment Transactions in India, FY 2017-18 to FY 2024-25

Financial Year	Volume (billion)	YoY Growth (%)	Context
2017-18	20.71	—	Post-demonetisation consolidation
2018-19	31.34	51.3	QR expansion, fintech tie-ups
2019-20	45.72	45.9	UPI 2.0, merchant adoption
2020-21	55.54	21.5	COVID-19 lockdown
2021-22	88.39	59.1	Post-lockdown surge, UPI AutoPay
2022-23	134.62	52.3	Credit card on UPI
2023-24	165.10	22.6	UPI Lite, rural expansion
2024-25	222.60	34.8	UPI crosses 185 billion transactions

Source: Ministry of Finance [8] for FY 2017-18 to FY 2022-23; Reserve Bank of India Annual Report [9] for FY 2023-24 and FY 2024-25. Growth rates computed by the authors.

Fig. 1: Growth of Digital Payment Transactions in India, FY 2017-18 to FY 2024-25



Source: Compiled by the authors from [8] and [9].

Interpretation. Volume grew almost eleven-fold over eight years. Two features of the series deserve attention. First, growth did not peak during the lockdown year itself: FY 2020-21 records the lowest year-on-year growth in the series, at 21.5 per cent, because the contraction of economic activity suppressed the absolute number of transactions even as the proportion conducted digitally rose. Second, the effect of the pandemic appears in the year that followed, when growth

rebounded to 59.1 per cent as restored economic activity met a population that had by then acquired the habit of paying digitally. The pandemic is therefore better understood as having changed payment behaviour durably than as having produced a one-year spike.

A. Drivers Behind the Trend

- Government policy. Demonetisation in 2016 and the Digital India mission raised awareness of digital payment, and the zero merchant discount rate policy encouraged merchant onboarding by removing the transaction fee.
- Technological innovation. The application programming interface architecture of UPI, biometric authentication through Aadhaar, and cloud scalability together made a high-volume real-time system feasible.
- The fintech ecosystem. Platforms such as PhonePe, Google Pay, Paytm and Amazon Pay improved the user experience and brought first-time users into the system.
- The pandemic effect. COVID-19 converted contactless payment from a convenience into a health precaution, which accelerated adoption across every segment of society.

VI. MAJOR TRENDS

A. Trend 1: Dominance of UPI

The UPI revolution has been the single most influential force shaping the ecosystem. Annual UPI volume expanded from about 2 crore transactions in FY 2016-17 to 24,162 crore in FY 2025-26, an almost twelve-thousand-fold increase [10].

Table 2: UPI Volume and Share of Total Digital Payment Volume

Financial Year	UPI Volume (billion)	Share of Total Volume (%)
2016-17	0.02	Negligible
2023-24	131.10	79.4
2024-25	185.80	83.4
2025-26	241.62	Not yet published

Source: Reserve Bank of India [9]; National Payments Corporation of India and Press Information Bureau [10].

Interpretation. UPI has become the backbone of India's retail payment system, carrying more volume than every other mode combined. Its share of ecosystem volume rose by four percentage points in a single year, from 79.4 per cent in FY 2023-24 to 83.4 per cent in FY 2024-25, which indicates that the instrument is still displacing others rather than having reached a stable equilibrium. Monthly volume crossed 2,000 crore transactions for the first time in August 2025 and peaked at 2,264 crore in March 2026 [10]. Cards and point-of-sale systems remain relevant for higher-value retail and online purchases, while the expansion of QR-based micro-transactions, UPI Lite and Aadhaar Pay has extended reach in semi-urban and rural areas.

B. Trend 2: Expansion of the Fintech Ecosystem

Between 2016 and 2025 India saw a boom in fintech start-ups offering digital payment solutions. More than two thousand fintech firms were launched from 2018 onward, and a small group of applications — PhonePe, Google Pay, Paytm, BharatPe and Amazon Pay — came to account for the overwhelming majority of UPI transactions. These applications introduced value-added features such as cashback rewards, autopay and bill-splitting, which encouraged mass adoption. Partnerships between banks, start-ups and the Reserve Bank of India have supported both scalability and financial inclusion.

C. Trend 3: Rural and MSME Inclusion

Data reported by the Ministry of Electronics and Information Technology indicate that a substantial share of new UPI users now come from rural and semi-urban regions, that tens of millions of small merchants have adopted QR-based acceptance, and that the Aadhaar-enabled Payment System has provided last-mile connectivity in cash-scarce areas. This marks a structural shift from concentrated urban adoption towards broader financial inclusion, extending formal banking access to small traders and daily-wage earners.

D. Trend 4: Policy and Regulatory Push

Policy intervention has consistently guided the trajectory of digital transformation by ensuring interoperability, consumer protection and market expansion. Demonetisation in 2016 forced rapid adoption of electronic payment; the Digital India mission of 2015 promoted internet and mobile connectivity; the Reserve Bank of India's Payments Vision 2025 set the

objective of e-payments for everyone, everywhere, every time; and the zero merchant discount rate policy removed the cost barrier to merchant acceptance.

Table 3: Summary of Key Trends, 2015-2025

Trend	Indicator	Impact
Transaction growth	20.7 to 222.6 billion	Rapid digitalisation
UPI dominance	Negligible to 83.4%	Unified digital ecosystem
Fintech expansion	2,000+ start-ups	Innovation and competition
Rural inclusion	Rising rural user share	Deeper financial inclusion
Policy support	10+ major initiatives	Structural transformation

Source: Compiled by the authors from [8], [9], [10] and [11].

The trends together show that growth has rested on a synergy of technological innovation in UPI and mobile payment, policy reform through Digital India and Reserve Bank initiatives, and behavioural adaptation as trust and convenience took hold among users. India's experience demonstrates how large-scale financial digitisation can be achieved through inclusive design, government support and private-sector innovation.

VII. CHALLENGES AND FUTURE PROSPECTS

Despite rapid growth, several challenges continue to hinder equitable adoption and secure usage.

Table 4: Key Challenges in India's Digital Payment Ecosystem

Category	Key Challenge
Cyber-security risk	Rising phishing and fraud attempts in UPI transactions
Digital divide	Limited and unreliable internet access in rural areas
Awareness and literacy	Low financial literacy and persistent fear of fraud
Infrastructure gaps	Unstable mobile networks and server downtime on peak days
Regulatory coordination	Multiple stakeholders and overlapping policies

Source: Compiled by the authors from Reserve Bank of India, NPCI and industry reports [9], [11], [12].

Table 5: Future Opportunities

Opportunity	Key Initiative or Direction
UPI global expansion	Acceptance extended to Singapore, the UAE and Nepal
Digital rupee (CBDC)	Reserve Bank pilot in wholesale and retail segments
AI-driven fraud detection	Machine learning for real-time risk monitoring
Rural financial inclusion	UPI Lite, Aadhaar Pay and voice-based payments
MSME and e-commerce integration	Wider digital acceptance among small businesses

Source: Compiled by the authors from [9], [10] and [13].

VIII. FINDINGS

- Total digital payment volume rose from 20.71 billion transactions in FY 2017-18 to 222.6 billion in FY 2024-25, an increase of almost eleven times in eight years.
- The pandemic's effect was delayed rather than immediate. FY 2020-21 recorded the lowest year-on-year growth in the series at 21.5 per cent, because economic contraction suppressed transaction counts; growth then rebounded to 59.1 per cent in FY 2021-22 as restored activity met a population that had acquired the habit of paying digitally.
- UPI has become the dominant instrument, carrying 185.8 billion transactions and 83.4 per cent of ecosystem volume in FY 2024-25, up from 79.4 per cent a year earlier, and reaching 241.6 billion transactions in FY 2025-26.
- Digital transactions now account for almost the entire volume of non-cash retail payments in India.
- Government initiatives, in particular the JAM trinity of Jan Dhan, Aadhaar and Mobile, have extended financial access to millions and drawn low-income and rural populations into the formal financial system.
- Fintech platforms have accelerated adoption through accessible design, cashback incentives and sustained marketing, and a small group of applications carries the majority of UPI volume.
- The growth of digital transactions has been accompanied by rising exposure to phishing, identity theft and online fraud, which makes a robust cyber-security framework a precondition for continued expansion.
- A rural-urban divide persists in infrastructure, connectivity reliability and digital literacy, and constrains equitable adoption.
- The regulatory environment established through Payments Vision 2025 and the Digital India programme has supported innovation, accessibility and consumer protection.
- India's UPI model and its central bank digital currency pilot have attracted international interest, and UPI acceptance has been extended to several other countries.

IX. SUGGESTIONS

- Strengthen the cyber-security framework through multi-layered authentication, robust encryption standards and machine-learning-based fraud detection operating in real time.
- Expand digital infrastructure by improving broadband and mobile connectivity in tier-III cities and rural areas, since infrastructure reliability rather than user willingness is now the binding constraint.
- Promote financial literacy through campaigns directed at rural users, small merchants and senior citizens, addressing both the mechanics of payment and the recognition of fraud.
- Encourage interoperability by promoting an open banking environment built on standard application programming interfaces and seamless cross-platform integration.
- Support MSMEs through fiscal incentives, tax relief or transaction fee waivers for small businesses that adopt digital payment platforms.
- Extend international cooperation by sharing India's UPI and digital payment expertise with developing countries through bilateral and multilateral arrangements.

X. CONCLUSION

The growth of digital payment systems in India over the past decade marks a transformative phase in the country's economic modernisation. Government initiatives, financial technology innovation and widespread behavioural adaptation have together established India as a leader in digital finance, and the Unified Payments Interface stands out as a landmark innovation that has democratised financial access, simplified transactions and enabled financial inclusion at scale.

The study confirms that this growth is not merely a technological shift but a socio-economic transformation. It has increased transparency, convenience and inclusion while reducing dependence on cash. The evidence also refines the common account of the pandemic's role: COVID-19 did not produce its largest effect in the lockdown year, when transaction volumes were suppressed by economic contraction, but in the years that followed, when a change in payment habit persisted after the emergency had passed. The pandemic is therefore best understood as having accelerated and made permanent a transition that was already under way.

Persistent challenges nevertheless threaten the sustainability of this progress, including cyber-security threats, infrastructure deficiencies and digital illiteracy. To maintain its leadership in digital finance, India must strengthen regulatory frameworks, build public trust through robust cyber-security systems, and close the digital divide between rural and urban populations. With continued policy support and innovation, a genuinely inclusive, secure and globally integrated digital payment ecosystem is attainable.

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