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TRANSFORMING TRANSACTIONS: INDIA'S UNIFIED PAYMENTS INTERFACE AND THE DIGITAL SHIFT

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ABSTRACT

Unified Payments Interface (UPI), launched by the National Payments Corporation of India, has transformed the Indian payment ecosystem. Its simplicity and accessibility have accelerated the growth of digital transactions, reaching even small corner shops. This paper explores the relationship between digital infrastructure, such as broadband and smartphone penetration, and UPI adoption in India, alongside the government-led initiatives that have facilitated its expansion. The analysis further highlights developmental outcomes, including enhanced financial inclusion, the integration of MSMEs into the formal financial system, and broader economic formalisation. At the same time, systemic challenges such as market concentration, technical downtimes, security concerns, and regulatory constraints that may affect UPI's long-term sustainability are critically examined. Based on these findings, the paper also offers policy recommendations to strengthen UPI's role in advancing inclusive and sustainable digital finance in India.

KEYWORDS: Unified Payments Interface, Digital Infrastructure, Financial Inclusion, Digital Payments, FinTech

1. INTRODUCTION

India's digital payment landscape has undergone a transformative shift, driven by the Unified Payments Interface (UPI), a real-time payment system developed by the National Payments Corporation of India (NPCI) in 2016. UPI enables seamless transactions across multiple bank accounts through a single mobile application, offering transparency, convenience, security, and interoperability (Aggarwal, Kaur, & Yadav, 2024). Its mobile-first architecture and simplified user experience are appreciated. UPI has made it accessible to a wide demographic, including previously unbanked and underbanked populations

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

The proliferation of smartphones and broadband connectivity has further accelerated UPI adoption, particularly among Micro, Small, and Medium Enterprises (MSMEs). TRAI (Telecom Regulatory Authority of India) data shows a positive correlation between broadband penetration and UPI transaction volumes, while smartphone adoption has expanded digital payment access across socio-economic segments.

Government initiatives such as the JAM Trinity, Digi Dhan Mission, and incentive schemes for low-value P2M UPI BHIM transactions have reinforced UPI's role in financial inclusion and economic formalisation. UPI's integration with India Stack and platforms like Gem Sahay, ONDC (Open Network for Digital Commerce), further strengthens its position as a pillar of India's Digital Public Infrastructure

Although the Unified Payments Interface has emerged as a cornerstone of India's digital economy, existing studies primarily focus on adoption behaviour, user convenience (Aggarwal et al., 2024; Padma Kiran & Sailaja, 2025), and their perception (Mani et al., 2024). Hence, it is important to systematically examine the relationship between digital infrastructure (internet penetration, smartphone usage) and UPI adoption, and UPI's broader role in financial inclusion, economic formalisation, and digital public infrastructure, as only limited studies are available on these. Without such analysis, the long-term developmental contribution of UPI remains underexplored. Thus, there is an insufficient focus on macro-level enablers such as broadband penetration and smartphone usage that directly drive UPI adoption, developmental outcomes including financial inclusion, inclusion of MSMEs into the formal financial system, and economic formalisation, and systemic challenges like market concentration, technical downtimes, and regulatory constraints that may hinder UPI's sustainability. This gap necessitates a complete study that integrates adoption drivers, outcomes, and challenges into a single framework.

RESEARCH OBJECTIVES

The primary objective of this study is to analyse the role of UPI in speeding up India's transition towards a digital and financially inclusive economy. Specifically, the study seeks to:

- Examine the relationship between digital infrastructure (internet and smartphone penetration) and UPI adoption.
- Assess UPI's contribution to financial inclusion, economic formalisation, and accelerating the digital economy.
- Identify systemic challenges that threaten UPI's growth and sustainability.
- Provide policy recommendations to strengthen the UPI ecosystem for long-term scalability.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

RESEARCH QUESTIONS

- How has the growth of digital infrastructure (broadband and smartphone penetration) influenced the adoption of UPI in India?
- In what ways does UPI contribute to financial inclusion and the formalisation of the Indian economy?
- What are the major challenges, competitive, technological, and regulatory, that constrain UPI's scalability?
- What policy measures can enhance the resilience and sustainability of UPI in India and beyond?

2. LITERATURE REVIEW

Unified Payments Interface (UPI), as a digital platform, demonstrates the principles of platform economics; its long-term sustainability is shaped by core dynamics such as user connection and network effects. Ribeiro, Silva & Chiarini (2025) emphasise that connection and network effects are fundamental to the dynamics of digital platforms for accelerating growth, deepening user engagement, and enhancing overall volume. These mechanisms foster scalability and reduce marginal costs, reinforcing UPI's role in India's digital financial infrastructure. UPI integrates multiple bank accounts, payment applications, and other entities within a unified system (Aggarwal et al., 2024). This way, UPI exemplifies user connection. Its rapid and continuous increase in user adoption (NPCI, 2025) reflects strong network effects, wherein each additional user enhances the platform's overall utility and value.

Digital infrastructure plays a vital role in financial inclusion (Daud & Ahmad, 2023). It expands access, lowers transaction costs, and bridges service gaps across underserved populations, especially when paired with technological innovation (Suhrab et al., 2025). The financial sector is undergoing a deep paradigm shift through the deployment of cutting-edge technologies, and financial technology innovation can significantly aid in promoting financial inclusion (Treu, 2025). However, the unavailability of infrastructure, such as reliable internet access in rural areas, continues to hinder FinTech adoption (Sam-Abugu, Luo, & Wong, 2025). Enhancing digital infrastructure in rural and underserved areas is therefore essential for advancing financial inclusion and improving economic and social outcomes (Bi, 2024). Creating a robust digital public infrastructure is pivotal not only for financial inclusion but also for fostering a competitive economy, enabling the delivery of essential services, and expanding economic opportunities (Ozili, 2025). Jia and Kanagaretnam (2025) further emphasize the role of digital infrastructure in advancing financial inclusion through alternative credit channels. Digital financial inclusion plays a vital role in advancing overall financial inclusion, acting as a catalyst for achieving universal access to financial services more rapidly and effectively. Niu et al, (2022) show that broadband infrastructure significantly improves digital financial inclusion in rural

China by expanding service coverage, though its impact on usage depends on local human and social capital levels.

UPI is playing a revolutionary role in the payment sector. The study by Ragini and Vineesh Prakash (2024) finds that UPI is seen as a relevant and effective tool for promoting financial inclusion in the informal sector, as they have studied the construction workers in Andhra Pradesh, India, but its success depends heavily on literacy, confidence, and streamlined documentation processes. MSMEs, a major contributor to the GDP, often suffer from a lack of credit, delayed payment, and a lack of sufficient working capital. To all these problems, fintech has the potential to provide a solution and bring MSMEs into the formal financial infrastructure. (Goyal et al., 2025)

Da Cunha Duarte (2025) illustrates how Brazil's instant payment system Pix, which shares many parallels with Indian UPI, has significantly contributed to the digital financial inclusion of women. Pix's inclusive design, zero-cost transactions, round-the-clock access, and simplified onboarding can advance digital financial inclusion for women in Brazil, offering a gender-aware perspective on FinTech adoption in emerging markets

3. METHODOLOGY

This study adopts a quantitative, descriptive, and analytical research design to examine the role of the Unified Payments Interface (UPI) in India's digital payment ecosystem. The methodology integrates secondary data collection, trend analysis, correlation analysis, and comparative evaluation.

This study relies exclusively on secondary data sourced from credible government and institutional platforms. Monthly UPI transaction volumes and adoption metrics (2016–2025) have been obtained from the National Payments Corporation of India (NPCI). Broadband subscription data for the same period is retrieved from the Telecom Regulatory Authority of India (TRAI). Additionally, smartphone penetration statistics (2010–2023) are drawn from Statista reports, while select indicators are sourced from the Government of India's Digi Dhan Dashboard.

The study employs a comprehensive analytical framework. Trend analysis was conducted to examine the growth trajectory of UPI transactions from 2016 to 2025. A correlation analysis was performed to assess the relationship between broadband user numbers and UPI transaction volumes. Additionally, a comparative analysis was undertaken to evaluate UPI's contribution within the broader digital transaction ecosystem.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

4. FINDINGS AND ANALYSIS

4.1. TREND ANALYSIS: GROWTH IN UPI TRANSACTIONS SINCE 2016

The National Payments Corporation of India (NPCI) indigenously developed the instant payment system, Unified Payment Interface (UPI), in 2016. UPI allows linking a savings account, a current account, an overdraft account, and RuPay credit cards. UPI requires mobile phones and internet connectivity apart from a bank account for making transactions, but the introduction of UPI 123 Pay allows feature phone users to make use of UPI, and UPI Lite X does not require internet connectivity for making transactions. The introduction of UPI in 2016 marked the beginning of a transformative phase in India's payment ecosystem. Transaction volumes, which started at only 4.46 million in January 2017, have grown exponentially over the years, crossing 20,008 million by August 2025 (NPCI, 2025). Thus, there is an evident and rapid UPI adoption in India.

The trend shows three distinct phases of growth:

1. **Initial Adoption (2016–2017):** UPI recorded very modest volumes in its early months, largely due to limited awareness and a small number of participating banks.

2. **Acceleration Phase (2017–2020):** The government-backed UPI system, introduced alongside demonetization, served as a catalyst for its widespread adoption. With limited access to cash, individuals increasingly turned to digital payment methods, leading to a surge in cashless transactions (Press Information Bureau, 2017). By January 2020, monthly UPI transaction volumes had surpassed 1.3 billion, reflecting its integration into everyday financial behaviour.

3. **Mass Adoption (2020–202):** The COVID-19 pandemic further accelerated digital payments as contactless transactions became essential (Press Information Bureau, 2024). Monthly volumes rose from 2.3 billion in January 2021 to 20 billion in August 2025. During this period, UPI became the dominant mode of retail digital payments, accounting for over 83% of total digital transactions (RBI, 2025).

4.2. RELATIONSHIP ANALYSIS

The use of the internet and mobile phones has significantly increased in the past ten years, and as a result, digital payments have also risen. The Internet and smartphones are the basic infrastructure underlying digital payments. Hence, building a strong digital infrastructure is important, as it can help establish a digital economy (Wang & Shao, 2024). A cashless economy driven by UPI is a subset of the digital economy. India's transition to a cashless digital economy has been fuelled by increased internet penetration, mobile device usage, and shifting consumer behaviour. The rise of an Internet-based economy and evolving digital media habits are foundational shifts enabling broader adoption of digital financial services, particularly mobile banking and app-based transactions. (Gomber et al., 2017). TRAI (Telecom Regulatory Authority of India) data shows that the number of broadband users is continuously increasing month by month (Telecom Regulatory Authority of India, 2016–2025). UPI transactions have also been steadily rising since the introduction of UPI in 2016 (National Payments

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

Corporation of India, 2025).

Table 1: Correlation between the number of broadband subscriptions and the Volume of UPI transactions from July 2016 to July 2025(month-on-month data)

Correlation between No of broadband users and the volume of UPI transactions (N=109)			
		No of broadband subscriptions	Volume of UPI
No of broadband subscriptions	Pearson Correlation	**1**	**.415****
	Sig. (2-tailed)		<0.01
Volume of UPI	Pearson Correlation		1
	Sig. (2-tailed)		
**. Correlation is significant at the 0.01 level (2-tailed).			

An analysis of month-on-month data from July 2016 to July 2025 (Table 1) indicates a positive linear relationship between broadband subscriptions and UPI transaction volumes, with broadband subscriber count serving as a key independent variable influencing UPI adoption. The Pearson correlation coefficient of 0.415 suggests a moderately positive association. However, when this is contextualised alongside other contributing factors, such as the steady rise in smartphone penetration (Table 2) and sustained government-led digital initiatives, the cumulative impact clearly supports the upward trajectory of UPI adoption across India.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

Table 2: The number of smartphone users since 2010 and the total volume of UPI transactions.

Year	Smart Phone users (millions)	Total volume of UPI Transactions (millions)
2010	34.1	
2011	59.08	
2012	91.26	
2013	130.11	
2014	191.67	
2015	253.09	
2016	307.75	2.65
2017	399.4	418.8
2018	485.14	3746.32
2019	642.34	10787.54
2020	757.2	18880.98
2021	853.42	38744.55
2022	938.27	74044.48
2023	1013.57	117675.97

Source: India: smartphone users 2040 | Statista

To promote financial inclusion, NPCI has introduced UPI 123Pay, a solution that enables feature phone users, who may not have access to smartphones, to perform UPI transactions. This initiative ensures that individuals without Android devices can still participate in digital payments through a safe, secure, and user-friendly interface, thereby extending the reach of UPI to underserved segments of the population.

The Government of India's Department of Financial Services (DFS) notified the incentive schemes for promotion of Person to Merchant (P2M) low-value BHIM (Bharat Interface for Money) transactions (up to Rs.2000/-) for one financial year (FY2021-22). The same scheme was again notified for the FY2023-24. The DFS acknowledges that the scheme helped in furthering the growth of UPI in India (Department of Financial Services, 2024).

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

4.3. COMPARATIVE ANALYSIS

Table 3: Comparison of the volume of digital payments and volume of UPI transactions YoY

Financial Year	Volume of Digital payment transactions (in millions)	Volume of UPI transactions (in millions)	Percentage of UPI in overall digital payments
2017-2018	20708.4	913	4.41%
2018-2019	31343.6	5351.9	17.07%
2019-2020	45717.6	12517.6	27.38%
2020-2021	55543.3	22329.6	40.20%
2021-2022	88457.9	45966.3	51.96%
2022-2023	133198.9	83240.4	62.49%
2023-2024	188071.4	130960.4	69.63%
2024-2025	238335.5	185847.8	78%
2025-2026	278565.4	238664.2	85.68%

Source: DIGIDHAN dashboard https://digipay.gov.in/dashboard/default.aspx

Digital payments in India continue to show strong growth, which is evident from Table 3. The total volume of digital payment transactions rose from 20,708.4 million in 2017–18 to 278565.4 million in 2025-26. In 2024-25, UPI accounted for 85.68% of the total digital payments, further strengthening UPI's position as the dominant payment channel. The data highlights two key points: Overall Growth – The consistent increase in total digital payments reflects India's rapid adoption of digital financial services, and UPI's Dominance – UPI's share has risen from 4.41% in 2017–18 to 85.68% by 2025–26, indicating that UPI is not only sustaining but also accelerating the overall expansion of digital transactions.

The findings clearly establish UPI's exponential growth, its strong association with digital infrastructure expansion, and its dominance over other digital payment methods in India. Together, these results not only highlight UPI's role as the backbone of India's digital payment ecosystem but also point toward deeper structural implications. To better understand these outcomes, it is essential to interpret them in the broader context of government initiatives, financial inclusion, and economic formalisation. The following discussion section builds on these findings to analyse their significance and policy relevance.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

5. DISCUSSIONS

5.1. GOVERNMENT INITIATIVES

5.1.1. JAM TRINITY

UPI is India's transformed digital payment landscape. This transformation in digital payments is supported by the JAM (Jan Dhan, Aadhar, and Mobile phones) trinity. Pradhan Mantri Jan Dhan Yojana (PMJDY) is a great financial inclusion step providing collective banking services for many unbanked households (Agarwala, Maity, & Sahu, 2024). Aadhaar is India's flagship product owned by the Unique ID Authority of India (UIDAI). It is a biometric identity system consisting of a twelve-digit unique number linked with the fingerprint, iris, photograph, and other demographics of every individual. As of April 2025, 141.8 crore Aadhar numbers have been generated, and 115.6 crore Aadhar numbers have been updated (Unique Identification Authority of India, 2025). Aadhaar is an effective method to identify individuals based on their biometrics. Aadhaar provides a digital identity and enables digital access to welfare benefits. (Mishra, 2024). Aadhar and digital payment systems introduced by NPCI form a strong infrastructure for easy and fast proliferation of fintech companies to provide various financial solutions, including payments. The JAM Trinity was initially designed to streamline direct benefit transfers, ensuring subsidies reached economically disadvantaged individuals efficiently (Sarma, 2025). Over time, it has evolved into a crucial framework for digital payments, providing the essential components of financial infrastructure: bank accounts, Aadhaar-enabled eKYC, and mobile connectivity. Now, JAM trinity forms a foundational infrastructure for digital payments (a bank account, eKYC, and Mobile phones). Hence prevalence of mobile phone usage, along with the opening of many PMJDY accounts and the availability of the Aadhar identification system, has enabled the boom of UPI usage in India.

5.1.2 DIGITAL INFRASTRUCTURE

Beyond rising internet and smartphone penetration, the success of UPI is also deeply rooted in India Stack, a set of Digital Public Infrastructure (DPI) tools like Aadhaar for identity, UPI and other digital methods for payments, and DEPA for data governance, that work together to make digital services simple, secure, and scalable. UPI's rapid adoption is largely fuelled by this foundation: Aadhaar enables easy and trusted identity verification, mobile-linked bank accounts simplify onboarding, and interoperable APIs allow instant, low-cost transactions. With DPI in place, UPI could grow quickly across India, reaching millions and transforming how people pay, save, and access financial services.

5.1.3. OTHER GOVERNMENT DRIVES

The Government of India is also focusing on bringing in a cashless India and has launched several initiatives and drives to promote the adoption and usage of UPI. Demonetization of Rs.. 500 and Rs. 2000 currency notes were announced in November 2016. Though there are many underlying motives for that, accelerating digital transactions was one of the prime reasons. (Choppala & Meka, 2024, p.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

7)

The Indian government introduced the BHIM (Bharat Interface for Money) App in December 2016 for digitally empowering India and financial inclusion. BHIM is a UPI-based mobile app developed by NPCI, which is promoted extensively by the government to encourage UPI usage. The other initiatives by the Government include the DigiDhan mission, launched by the Ministry of Electronics and Information Technology, which aims to promote digital payments and achieve a cashless economy. The mission has significantly contributed to UPI's exponential growth, with UPI accounting for 70% of total digital transactions in FY 2023-24. Government-backed incentive schemes under DigiDhan have encouraged banks and merchants to adopt UPI, expanding its reach. The mission has facilitated QR code and POS terminal deployment, ensuring seamless UPI transactions. Incentives were provided on low-value BHIM UPI transactions on P2M payments to promote UPI usage. UPI123Pay and UPILiteX were introduced for feature phone users and offline payments, respectively. UPI Lite enables small value transactions using an on-device wallet, enabling quick payment in crowded places.

Another strategic initiative by the government is the integration of RuPay credit cards with UPI, enabling seamless credit-based transactions via asset-lite QR codes. This effort enhances financial inclusion by allowing small merchants to accept credit payments without the need for traditional card terminals. UPI is integrated with various government portals and services. For example, Goods and Services Tax (GST) can be paid through UPI in addition to net banking since January 19, 2024. Also, investors can apply for an Initial Public Offering in both the National Stock Exchange (NSE) and the Bombay Stock Exchange (BSE) using UPI as a payment option. UPI ensures an instant fund transfer experience while subscribing for IPO, and creates instant mandates and instant application submission.

5.1.4. UPI ACROSS BORDERS

Cross-border remittance through Unified Payment Interface (UPI) in real time is also made possible now. Indian UPI can be used to make overseas digital transactions in some markets. The UPI apps that support international transactions include Google Pay, PhonePe, and Wise. The users of Singapore’s instant payment system PayNow can send money to India’s UPI users, and Indian UPI users can send money to Singapore's PayNow. Apart from Singapore, cross-border UPI payments are accepted in six more countries. These countries are the UAE, France, Nepal, Bhutan, Sri Lanka, and Mauritius. So, Indians can use UPI for making payments to other countries, which include Bhutan, Nepal, France, Sri Lanka, Mauritius, Oman, UAE, and Singapore. NIPL (NPCI International Payments Limited) signed an agreement with Liquid Group to enable QR-based UPI payments in 10 countries: Malaysia, Thailand, Philippines, Vietnam, Cambodia, South Korea, Japan, Taiwan, Hongkong and the United Kingdom. (Economic Times, 2025)

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

The inbound travellers to India can also make use of UPI and make payments easier. UPI One World is the Prepaid Payment Instrument linked to UPI of foreign nationals from G20 countries and NRIs. The inbound travellers have to use the PPI UPI app and load money through PPI issuers who are allowed to make money exchange as well and can use UPI one world to make payments at UPI enabled merchant locations. The ease of making digital payments in India will attract more foreign travellers to visit India and will increase revenue from them.

5.2. IMPACT OF UPI ON FINANCIAL INCLUSION

UPI has simplified digital transactions, allowing people with limited financial literacy and restricted access to traditional banking services to use it with ease. Compared to conventional banking methods, UPI is more cost-effective, making it affordable for underbanked and unbanked populations. As a real-time system, it provides instant fund transfers, ensuring accessibility and efficiency.

Evidence from other countries shows that similar payment systems have advanced financial inclusion. For example, Pix, the instant payment system introduced by the Central Bank of Brazil, included 71.5 million individuals—nearly one-third of the country's population—into the financial system (Da Cunha Duarte, 2025). Likewise, Thailand's QR Code Payment system, developed under the Thailand 4.0 policy, has supported economic modernization and inclusion by creating a secure, efficient, and low-cost payment ecosystem (Ponsree, 2024). It is mentioned in the SIIPS 2022 case study that, the NIBSS Instant Payment (NIP) in Nigeria has reduced cash dependency, lowered transaction costs, and expanded access through features such as mobile wallets, QR payments, and biometric verification numbers

In India, UPI has enabled micro and small businesses to accept digital payments, thereby bringing them into the formal economy. Together with Aadhaar, which facilitates eKYC and authentication, UPI forms the backbone of India's digital financial infrastructure. This combination expands financial access, improves security, and strengthens participation in the economy (Kanojia, Kaur, Bhavya, 2024). To enhance rural inclusion, the Reserve Bank of India (RBI) has urged financial institutions to develop low-bandwidth mobile applications for feature phone users (The Economic Times 2025). Innovations such as UPI123Pay and UPI Lite X further support inclusion by enabling individuals without robust internet connectivity or smartphones to participate in digital payments.

Micro, Small, and Medium Enterprises (MSMEs) play a vital role in strengthening India's economy. These enterprises typically require smaller loan amounts, shorter repayment timelines, and quick access to funds on a recurring basis. Addressing the challenges of the MSME sector through digital technology is therefore essential. A robust digital payment system can streamline MSME transactions, expand their access to online markets, and enhance customer experience through features such as

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

instant discount partnerships (Buteau, 2021).

5.3. ECONOMY FORMALIZATION

UPI has promoted the digital economy by making cashless transactions more accessible. This reduces the dependency on cash. Reduced dependency on cash, on the other hand, reduces the size of the informal economy, increases tax revenues, and curbs the circulation of black money. UPI, particularly post-demonetization, has significantly influenced India's push towards a cashless economy. The adoption of UPI-based applications has enhanced financial inclusion, with digital payment systems reducing dependency on cash transactions. Government and private-sector initiatives have leveraged media campaigns to bridge the digital divide, ensuring awareness and adoption even in rural areas. As the digital economy evolves, UPI's integration into daily financial transactions plays a pivotal role in formalizing economic activities and driving digital transformation across sectors (Jana et al., 2024).

6. KEY ISSUES FACED BY UPI IN INDIA'S PAYMENT ECOSYSTEM

6.1. MEAGER SHARE OF INDIGENOUS UPI

The UPI market in India is dominated by foreign players like Google Pay and Phone Pe. During February 2026, the Google-owned Google Pay and the Walmart-owned Phone Pe together hold a majority (16,051.36 million) of the UPI transactions. In contrast, government-backed BHIM, which was initially introduced to promote UPI adoption, recorded only 175.93 million transactions (Table 4), placing it far behind both private-sector competitors and Navi and Supermoney. This clearly indicates that BHIM holds a low market share. BHIM had a market share of only 0.2% in February 2025, while Phonepe and Google Pay had 48.2% and 36.8% respectively (*The Economic Times*, 2025). Paytm, third in the list, has significant investments from foreign entities. Other Indian-owned apps, such as Cred and Navi, have comparatively little market share.

While India promotes "Make in India" as a measure to uplift the economy, it becomes crucial to support indigenous UPI players. It is important to promote more Indian UPI apps that increase the trust of users in UPI.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

Table 4: Various UPI Apps and their volume of transactions in February 2026

	UPI Application Name		Volume of Transactions (millions)
1.	PhonePe		9284.22
2.	Google Pay		6767.14
3.	Paytm		1,595.09
4.	Navi		650.28
5.	Super. Money		289.32
6.	BHIM		175.93
7.	Fam App by Trio		149.06
8.	Cred		145.98
9.	Axis Bank App		26.10

Source: Unified Payments Interface (UPI) Ecosystem Statistics | NPCI

6.2.INCIDENTS OF TECHNICAL GLITCHES AND DOWNTIMES

Downtime is the measure of how long a service is unavailable. The increase in digital transactions during peak hours results in an overload of the system, and hence it delays and disrupts the payment processing. This service unavailability has been attributed to the weak technology on the bank's side by the then RBI Governor, Shakti Nata Das (The Economic Times,2024). Several instances of downtime have been reported in May 2024 as the volume of UPI transactions per day exceeded 450 million in May 2024. So, it becomes essential for the banks to make their technology and infrastructure robust to ensure seamless delivery of payment services.

6.3. SECURITY CONCERNS

In any digital payment system, security is a major concern. Though NPCI has implemented robust security measures, the Payment Service Providers should update their technology and should be able to resist the various cyber threats like phishing attacks, malware, and data breaches. A systematic review by Diallo et al., (2025) highlights that FinTech mobile-based apps in developing countries, including platforms like UPI, face persistent threats such as limited connectivity, which hinders systemic device update, SIM swap fraud, weak encryption, and insecure data storage, exacerbated by low-cost devices and limited user awareness.

6.4. REGULATORY COMPLIANCES

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

The payment system UPI is part of the Fintech Industry, and India is among the fastest-growing Fintech markets in the world. As the Fintech industry is rapidly expanding in India, it becomes significant for the regulators to allow the industry to evolve innovatively, and at the same time, there should be regulatory compliance to protect the safety of the users. In order to ensure the regulated and orderly growth of Fintech in India, RBI has come up with Regulatory Sandboxes, and the first cohort of the same was retail payments (Reserve Bank of India, 2025). The regulators have to continuously monitor and take corrective actions without hindering innovation in the industry.

7. SUGGESTIONS AND POLICY IMPLICATIONS

7.1. PROMOTE INDIGENOUS UPI APPLICATIONS

The data (Table 4) highlights a high market concentration in UPI transactions, dominated by many foreign-owned platforms. This dependency raises concerns over data sovereignty and systemic risk. Policymakers should encourage the development and adoption of indigenous UPI applications like BHIM and bank-led apps by investing in user-friendly designs, incentive schemes, and marketing strategies. The Government of India has urged NPCI to boost BHIM's market share to 5% by 2028. However, acceleration is needed, as PhonePe and Google Pay collectively commanded more than 85% of the market as of March 2025(*The Economic Times*, 2025). Strengthening domestic players will ensure greater resilience and reduce reliance on foreign-owned platforms for critical payment infrastructure.

7.2.STRENGTHEN BANK'S IT INFRASTRUCTURE:

As UPI transaction volumes continue to rise, frequent downtime and technical glitches have been reported. To sustain trust and reliability in the system, banks must upgrade their IT infrastructure, improve server capacity, and ensure round-the-clock transaction processing. Stronger backend systems will reduce failed transactions, enhance user experience, and support the scalability of UPI in the long term.

7.3.INCENTIVIZE RURAL ADOPTION

UPI has revolutionized the payments landscape, yet certain limitations continue to hinder its full-scale adoption (Kumar et al, 2025). While urban adoption is comparatively good, rural expansion remains constrained by poor internet access and reliance on feature phones. To address this gap, initiatives like UPI 123Pay and UPI LiteX need scaling up and broader implementation. Additionally, incentive programs such as DFS-led subsidies for low-value merchant transactions should be extended to rural areas, enabling small vendors, farmers, and the unbanked to participate more fully in the digital payments ecosystem.

International Journal of Research in Commerce and Management Studies

ISSN 2582-2292

Vol. 8, No. 02 March-April; 2026 Page. No. 865-883

7.4.EXPAND CROSS-BORDER UPI ADOPTION:

UPI's potential extends beyond domestic markets. Initiatives like UPI One World demonstrate India's ambition to position UPI as a global standard for real-time payments. Policymakers should strengthen partnerships with central banks and fintech regulators in countries with high Indian diaspora populations and trade linkages. Expanding cross-border UPI usage will not only facilitate remittances at lower costs but also enhance India's influence in shaping global payment systems.

7.5.ENHANCE REGULATORY SANDBOXES FOR INNOVATION:

Continuous innovation is vital to maintaining UPI's growth. By expanding regulatory sandboxes, the Reserve Bank of India (RBI) and NPCI can provide fintech firms with safe testing environments for developing new features such as credit-on-UPI, offline payments, and AI-driven fraud detection. Encouraging innovation within a structured regulatory framework will strengthen consumer protection while fostering a dynamic ecosystem for digital financial services.

8. CONCLUSION

The research contributes to academic literature by integrating adoption trends, infrastructure relationships, and comparative market analysis within a single framework. It also provides insights for policy debates, emphasising the need to strengthen bank IT systems, promote indigenous UPI applications, and expand both rural and cross-border adoption.

At a national level, UPI has played a central role in advancing the "Har Payment Digital" mission, driving financial inclusion, and integrating micro and small enterprises into the formal economy. Its innovations, such as UPI 123Pay and UPI Lite, have extended accessibility to underserved groups, reinforcing its developmental impact.

Looking ahead, future research can explore emerging frontiers such as the integration of artificial intelligence for fraud detection and personalised services, the interoperability between UPI and Central Bank Digital Currencies (CBDCs), and the global scaling of UPI through initiatives like UPI One World. These directions will further shape UPI's role not only in India's digital transformation but also in influencing the future of real-time payments worldwide.

REFERENCES:

1. Agarwala, N., Maity, S. & Sahu, T.N. Efficiency of Indian banks in fostering financial inclusion: an emerging economy perspective. *J Financ Serv Mark* **29**, 341–353 (2024). https://doi.org/10.1057/s41264-022-00203-7

2. Aggarwal, A.G, Kaur, G., & Yadav, S. (2024). A study of factors affecting behavior intention of tourists towards unified payments interface adoption in Delhi-NCR region. *International Journal of System Assurance Engineering and Management.* Advance online publication. https://doi.org/10.1007/s13198-024-02660-w

3. Bi, J. (2024). Can rural areas in China be revitalized by digitization? A dual perspective on digital infrastructure and digital finance. *Finance Research Letters, 67*(Part A), 105753. https://doi.org/10.1016/j.frl.2024.105753

4. Buteau, S. (2021). Roadmap for digital technology to foster India's MSME ecosystem—opportunities and challenges. *CSI Transactions on ICT*, 9, 233–244. https://doi.org/10.1007/s40012-021-00345-4

5. Choppala, P. B., & Meka, J. S. (2024). The Digital India Initiative: A Realisation of Babasaheb's and Mahatma's Vision. *Digital Society*, 3(38). Springer. https://doi.org/10.1007/s44206-024-00124-z

6. da Cunha Duarte, P. Digital financial inclusion and women: a case study of Pix, the Brazilian instant payment system. *Eurasian Econ Rev* **15**, 379–400 (2025). https://doi.org/10.1007/s40822-024-00300-z

7. Daud, S. N. M., & Ahmad, A. H. (2023). Financial inclusion, economic growth and the role of digital technology. *Finance Research Letters,* 53, 103602. https://doi.org/10.1016/j.frl.2022.103602

8. Department of Financial Services. (2024, July 31). *Brief: Incentive scheme for promotion of RuPay and UPI*. Ministry of Finance, Government of India. Retrieved August 23 , 2025, from https://financialservices.gov.in/beta/en/page/brief

9. Diallo, A., Samhi, J., Bissyandé, Klein J. (In)Security of mobile apps in developing countries: a systematic literature review. *Empir Software Eng* **30**, 131 (2025). https://doi.org/10.1007/s10664-025-10689-z

10. Gomber, P., Koch, JA. & Siering, M. Digital Finance and FinTech: current research and future research directions. *J Bus Econ* **87**, 537–580 (2017). https://doi.org/10.1007/s11573-017-0852-x

11. Goyal, K.A., Mertiya, T., Bishnoi, S., Bhatia, D. (2025). How Can FinTech Adoption Benefit the MSME Sector in India?. In: S., A., Dalwai, T., Singh, D. (eds) *Trends and Challenges of Electronic Finance.* Palgrave Macmillan, Singapore. https://doi.org/10.1007/978-981-96-3304-3_15

12. Jana, M., Longkumer, W., & Kumar, A. (2024). 'UPI Chalega' campaign: significance of broadcast media, promoting digital payment system in West Bengal. International Journal of Information Technology, 16(1), 153–158. https://doi.org/10.1007/s41870-023-01589-w

13. Jia, X., & Kanagaretnam, K. (2025). Digital inclusion and financial inclusion: Evidence from peer-to-peer lending. *Journal of Business Ethics,* 196(2), 345–380. https://doi.org/10.1007/s10551-024-05689-w

14. Kanojia, S., Kaur, S. & Bhavya Business sustainability in the era of Fintech and Regtech: a systematic literature review. *Discov Sustain* **5**, 525 (2024). https://doi.org/10.1007/s43621-024-00767-5

15. Kumar, P., Venaik, A., Goyal, R., & Venaik, U. (2025). Penetration of UPI payment methods in Indian states: A comparative study on metropolitan states versus other states. In A. Swaroop, B. Virdee, S. D. Correia, & Z. Polkowski (Eds.), *Proceedings of Data Analytics and Management (ICDAM 2024)* (Lecture Notes in Networks and Systems, Vol. 1298, pp. 579–599). Springer. https://doi.org/10.1007/978-981-96-3355-5_44

16. Mani, V., Ramachandran, M., Rajan, K., Ellangovan, K., Subramanian, V. V., & Suganeswari, T. V. (2024). *Unraveling consumer perception towards UPI in India: An empirical research*. In S. Li (Ed.), *Information Management* (pp. 162–169). Springer. https://doi.org/10.1007/978-3-031-64359-0_13

17. Ministry of Electronics and Information Technology. (2024, July 26). *DigiDhan Dashboard*. Government of India. Retrieved June 16, 2025, from https://digipay.gov.in/dashboard/About.aspx

18. Mishra, R.K. Feedback and (Social) Loop: Biometric System and the Digital Empire in India. *Development* **67**, 91–99 (2024). https://doi.org/10.1057/s41301-024-00409-3

19. National Payments Corporation of India. (2025). *Unified Payments Interface (UPI) product statistics*. NPCI. Retrieved September 25, 2025, from https://www.npci.org.in/what-we-do/upi/product-statistics

20. Niu, G., Jin, X. S., Wang, Q., & Zhou, Y. (2022). Broadband infrastructure and digital financial inclusion in rural China. *China Economic Review,* 76, 101853. https://doi.org/10.1016/j.chieco.2022.101853

21. Ozili, P. K. (2025). Digital public infrastructure: Concepts, global efforts, benefits, challenges, and success stories. *Digital Society*, 4(30). https://doi.org/10.1007/s44206-025-00185-8

22. Padma Kiran, K., & Sailaja, V. N. (2025). Assessing Unified Payments Interface (UPI) adoption and usage through the interplay of UTAUT factors. *Humanities and Social Sciences Communications*, 12(1060). https://doi.org/10.1057/s41599-025-05313-w

23. Ponsree, K. QR code payment in Thailand 4.0 era: expand the understanding of perceived susceptibility to COVID-19 in the TAM theory. *Curr Psychol* **43**, 22637–22655 (2024). https://doi.org/10.1007/s12144-023-05605-x

24. Press Information Bureau. (2017, August 30). *Finance Ministry: Demonetization immensely beneficial to Indian Economy and People* [Press release]. Retrieved September 2, 2025, from https://www.pib.gov.in/newsite/printrelease.aspx?relid=170378

25. Press Information Bureau. (2024, December 1). *UPI: Revolutionizing digital payments in India – Processed over 16 billion transactions worth ₹23.49 Lakh Crores in October 2024* [Press release]. Retrieved August 18, 2025, from https://www.pib.gov.in/PressReleasePage.aspx?PRID=2079544.

26. Ragini, B., & Vineesh Prakash, J. (2024). Does Unified Payment Interface (UPI) contribute to financial inclusion? The case of construction workers in Andhra Pradesh. In S. Mohapatra, P. Padhi, & V. Singh (Eds.), *Financial Markets, Climate Risk and Renewables* (pp. 257–272). Springer. https://doi.org/10.1007/978-981-97-6687-1_10

27. Reserve Bank of India. (2025). *Regulatory sandbox - FinTech*. RBI. Retrieved from https://fintech.rbi.org.in/FT_RegSandbox.

28. Reserve Bank of India. (2025, June 5). *Moving the boundaries of financial inclusion—A regulatory perspective.* Retrieved from https://www.rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1508

29. Ribeiro, L.C., Silva, V. & Chiarini, T. Mapping the platform economy: a methodology for identifying and locating digital platform companies using NLP techniques. *Qual Quant* **59**, 3461–3485 (2025). https://doi.org/10.1007/s11135-025-02106-w

30. Sam-Abugu, C., Luo, X., & Wong, B. (2025). The combined role of FinTech innovation and financial literacy in sustainable financial inclusion in Nigeria. *International Review of Economics, 72*(14). https://doi.org/10.1007/s12232-025-00490-1

31. Sarma, M. (2025). *Financial digitalization in India*. Eurasian Economic Review, 15, 401–424. https://doi.org/10.1007/s40822-024-00298-4

32. SIIPS. (2022). *Case study: NIBSS Instant Payments (NIP)*. State of Instant and Inclusive Payment Systems in Africa (SIIPS) 2022. https://www.africanenda.org/uploads/files/22312_EN_SIIPS_Casestudy_NIP_HQ.pdf
33. Suhrab, M., Pinglu, C., Qian, N., & Khan, H. (2025). Leveraging infrastructure and technological innovation for financial inclusion: Pathways to achieving sustainable development goals in BRICS nations. *SN Business & Economics*, 5(70). https://doi.org/10.1007/s43546-025-00828-5
34. Telecom Regulatory Authority of India. (2016–2025). *Monthly telecom subscription reports*. TRAI. Retrieved September 25 , 2025, from https://trai.gov.in/release-publication/reports/telecom-subscriptions-reports
35. The Economic Times (2024). *Inadequate tech at banks to blame for UPI downtimes*. The Economic Times. Retrieved March 20, 2025 from https://economictimes.indiatimes.com/industry/banking/finance/banking, /inadequate-tech-at-banks-to-blame-for-upi-downtimes/articleshow/110806141.cms
36. The Economic Times. (2025). *List of countries where Indians can use UPI to make payments; how to activate, make payments using UPI International*. The Economic Times. Retrieved March 20, 2025 from https://economictimes.indiatimes.com/wealth/save/how-to-activate-make-payments-using-upi-international/articleshow/107626614.cms 20
37. The Economic Times. (2025, June 12). *RBI moots apps for feature phones to deepen financial inclusion*. *The Economic Times*. Retrieved August 21, 2025 https://economictimes.indiatimes.com/epaper/delhicapital/2025/jun/12/et-mkts/rbi-moots-apps-for-feature-phones-to-deepen-fin-inclusion/articleshow/121787698.cms
38. The Economic Times. (2025, March 13). *Government seeks 5% UPI market share for Bhim by 2028. The Economic Times. Retrieved September 20, 2025 from https://economictimes.indiatimes.com/tech/technology/government-seeks-5-up,i-market-share-for-bhim-by-2028/articleshow/118983969.cms*
39. Treu, J. (2025). Financial inclusion and FinTech. In B. Friele, M. Kart, D. Kergel, J. Rieger, B. Schomers, K. Sen, M. Staats, & P. Trotzke (Eds.), *Social work and social transformation between exclusion and inclusion* (pp. 99–125). Springer. https://doi.org/10.1007/978-3-658-47583-3_9
40. Unique Identification Authority of India. (2025, April). *Aadhaar generation dashboard*. UIDAI. Retrieved May 25, 2025 from https://uidai.gov.in/aadhaar_dashboard/
41. Wang, L., & Shao, J. (2024). The energy saving effects of digital infrastructure construction: Empirical evidence from Chinese industry. *Energy, 294*, Article 130778. https://doi.org/10.1016/j.energy.2024.130778