Growth of UPI-Based Digital Payments in India: Trends, Challenges and Future Prospects

Asray R C

Designation: Assistant Professor

Department: Department of Economics

Institution: National College of Arts and Science, Puliyavu.

Nefa CP

Designation: PG Scholar

Department: PG Department of Commerce

Institution: National College of Arts and Science, Puliyavu.

Jahana Sherin

Designation: PG Scholar

Department: PG Department of Commerce

Institution: National College of Arts and Science, Puliyavu.

Ayisha Thasneem

Designation: PG Scholar

Department: PG Department of Commerce

Institution: National College of Arts and Science, Puliyavu.

Abstract

The Unified Payments Interface (UPI) has moved from the margins to the centre of India's retail payment system within a decade. This paper uses official annual data for 2016-17 to 2025-26 to study how UPI has grown in transaction volume, value and bank participation, and what challenges it faces. Volume rose from 1.78 crore to 24,162 crore transactions and value from ₹0.07 to ₹314 lakh crore. Growth has slowed every year since 2021-22 (volume growth fell from 106% to 30%), which points to a shift from rapid adoption to maturity. The average value per transaction has fallen about 29% from its 2020-21 peak to roughly ₹1,300, showing that UPI is now used mainly for small everyday payments. The main challenges are fraud and social engineering, outages, dependence on a few apps, an unsettled funding model, and gaps in literacy and grievance redressal. The paper ends with suggestions for secure and inclusive growth.

Keywords: UPI; digital payments; financial inclusion; fraud; India

1.Introduction

For most of the twentieth century, retail payments in India were dominated by cash and paper instruments. After 2016 this changed quickly. Bank accounts under the Pradhan Mantri Jan Dhan Yojana, the Aadhaar identity system, cheap mobile data, smartphones and the withdrawal of high denomination notes in November 2016 created conditions in which digital payments could scale. The Unified Payments Interface (UPI), launched by the National Payments Corporation

of India (NPCI) in 2016, was the key innovation. A user can link several bank accounts to one app, send or collect money instantly through a virtual payment address or QR code, and authorise it with a PIN. In 2025-26 UPI handled 24,162 crore transactions worth about ₹314 lakh crore and made up about 84% of India's digital payments by volume (Ministry of Finance, 2026a). This paper asks two questions. First, how have transaction volume, value and bank participation grown, and is the pattern of growth changing? Second, what challenges do users and other participants face that could limit future growth?

2.Literature review

Research on digital payments in India can be grouped into three strands. The first explains adoption, usually through the Technology Acceptance Model (Davis, 1989) and UTAUT (Venkatesh et al., 2003), which stress usefulness, ease of use, trust and social influence. Patil et al. (2020) extend a meta-UTAUT model for India with personal innovativeness, anxiety, trust and grievance redressal, showing that service-recovery arrangements shape adoption, and Sivathanu (2019) finds that behavioural intention and resistance to innovation affected actual use during demonetisation, with stickiness to cash weakening the link between intention and use. The second strand asks whether policy and health shocks pushed India towards digital payments. Crouzet et al. (2023) show that the 2016 cash shortage accelerated adoption of a leading digital wallet through network effects, and Chodorow-Reich et al. (2020) document the short-run economic cost of the shock, but Yadav and Das (2024) find insufficient evidence that demonetisation raised adoption, although the COVID-19 lockdown did spur some newer channels, which suggests that sustained usage depends on convenience and merchant acceptance rather than on the shock alone. The third strand examines economic effects, inclusion and risks. Low-cost, interoperable systems reduce transaction costs and improve risk sharing (Jack & Suri, 2014), and Alonso et al. (2023) describe UPI as part of a digital public infrastructure that widened access, while noting that low digital literacy remains a barrier and that data protection safeguards are still needed; financial literacy is in turn closely linked to how well people use financial services (Lusardi & Mitchell, 2014). Existing evidence therefore consists mainly of survey-based studies of adoption intentions, studies of the demonetisation and pandemic shocks, and descriptions of digital public infrastructure. To the author's knowledge, few studies follow UPI's own volume, value, average transaction size and bank participation across its first decade using official data, or link those trends to the challenges the system now faces, and this paper addresses that gap.

3.Methodology

The study is descriptive and uses secondary data. Annual volume (crore), value (₹ lakh crore) and the number of banks live on UPI for 2016-17 to 2025-26 come from the Ministry of Finance statement on ten years of UPI (2026a), its Lok Sabha reply for 2021-22 to 2025-26 (2026b) and the Economic Survey 2021-22 statistical appendix (NPCI data) for 2017-18 to 2020-21 (Government of India, 2022). Growth rates, compound annual growth rates (CAGR) and average value per transaction (value divided by volume) were calculated by the author.

4. Growth of Digital Payments

4.1 Volume and value

Table 1 and Fig. 1 show the data. Volume rose from 1.78 crore in 2016-17 to 24,162 crore in 2025-26, and value from ₹0.07 lakh crore to ₹314 lakh crore. The very large increases in the first two years come from a tiny base and should be read with caution. From 2019-20 to 2025-26, volume grew at about 64% a year and value at about 57% a year.

Table 1. UPI volume, value, average value per transaction and banks live

Year	Volume (crore)	Growth (%)	Value (₹ lakh crore)	Growth (%)	Avg. value (₹)	Banks live
2016-17	1.78	n.a.	0.07	n.a.	—	44
2017-18	91.5	5,040*	1.10	1,469*	1,200	91
2018-19	535.3	485.0*	8.77	698.7*	1,638	142
2019-20	1,251.9	133.9	21.32	143.1	1,703	148
2020-21	2,233.1	78.4	41.04	92.5	1,838	216
2021-22	4,595.6	105.8	84.16	105.1	1,831	314
2022-23	8,371.4	82.2	139.15	65.3	1,662	399
2023-24	13,113.0	56.6	199.95	43.7	1,525	572
2024-25	18,586.6	41.7	260.56	30.3	1,402	661
2025-26	24,161.7	30.0	314.23	20.6	1,301	703

*Source: Ministry of Finance (2026a, 2026b); Government of India (2022); growth rates and averages computed by the author. * Mainly a base effect.*

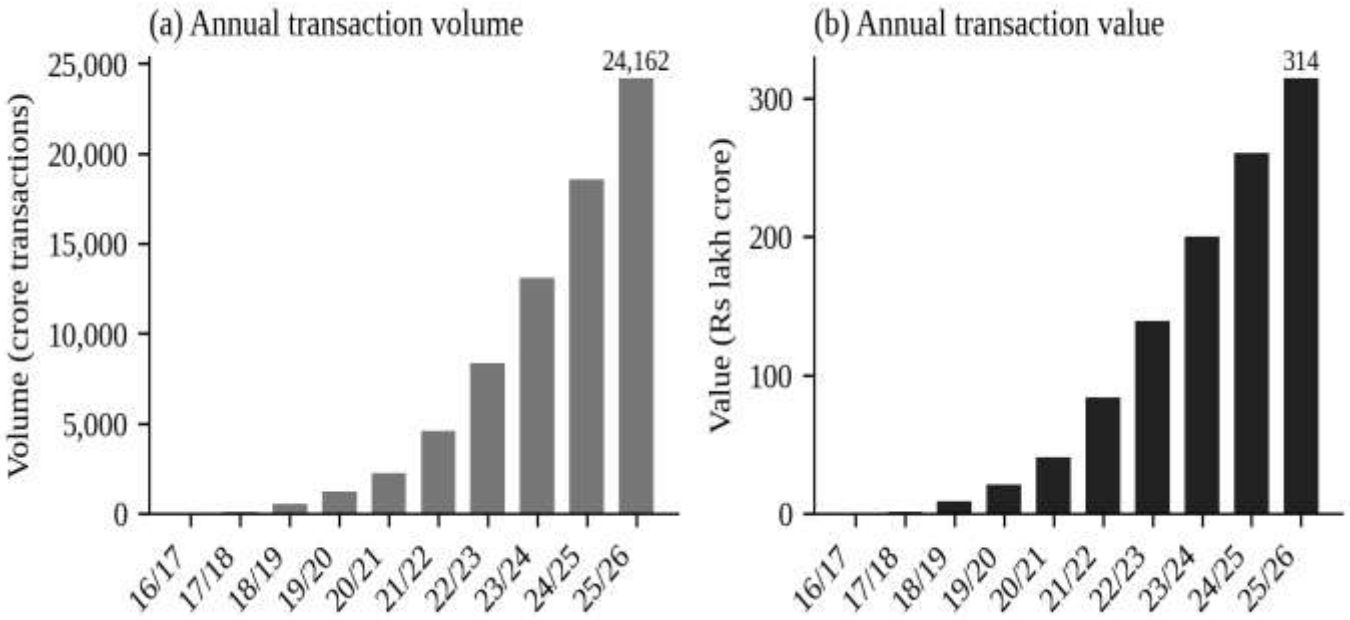


Fig. 1. Annual UPI transaction volume (a) and value (b). Growth was lower in 2020-21 (78%), the pandemic year, and rebounded to 106% in 2021-22. Since then, it has fallen every year: 82%, 57%, 42% and 30% for volume, and 65%, 44%, 30% and 21% for value (Fig. 2). Even so, the volume added in 2025-26 alone, about 5,575 crore transactions, is more than the whole of 2021-22 (4,596 crore). The system is therefore maturing, not stalling: growth rates fall while absolute additions remain large.

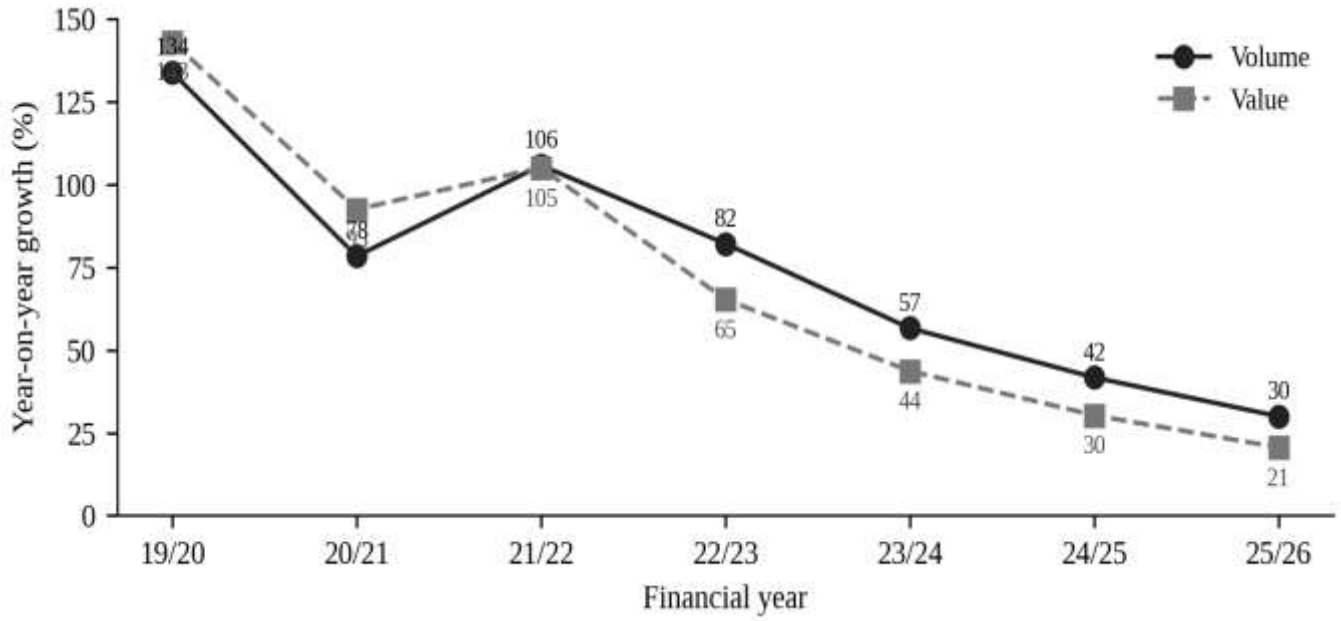


Fig. 2. Year-on-year growth in volume and value (per cent).

4.2 Average value per transaction

Value has grown more slowly than volume every year since 2022-23. As a result, the average value per transaction peaked at about ₹1,838 in 2020-21 and has fallen every year since, to about ₹1,301 in 2025-26, a decline of 29% (Fig. 3). In 2025-26, person-to-merchant payments made up 63% of volume but only 29% of value, and 86% of them were below ₹500 (Ministry of Finance, 2026a). UPI is therefore increasingly used for groceries, transport, food, utilities and street-vendor payments rather than occasional large transfers.

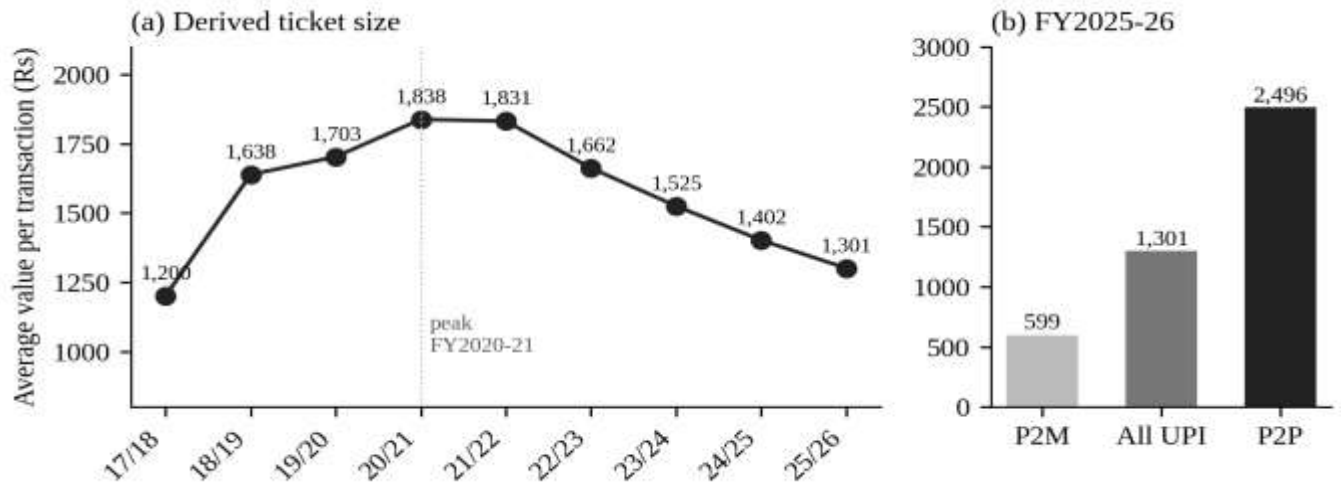


Fig. 3. Average value per transaction (a) and by payment type, 2025-26 (b; approximate, from rounded shares).

4.3 Banks live on UPI

The number of banks live on UPI rose from 44 in 2016-17 to 703 in 2025-26, a growth rate of about 36% a year (Fig. 4). Additions peaked at 173 in 2023-24 and fell to 89 and 42 in the next two years, suggesting that most eligible banks have already joined. Bank numbers and usage have risen together (correlation about 0.97), but because both series trend upwards this shows parallel growth and does not prove that onboarding more banks caused more usage.

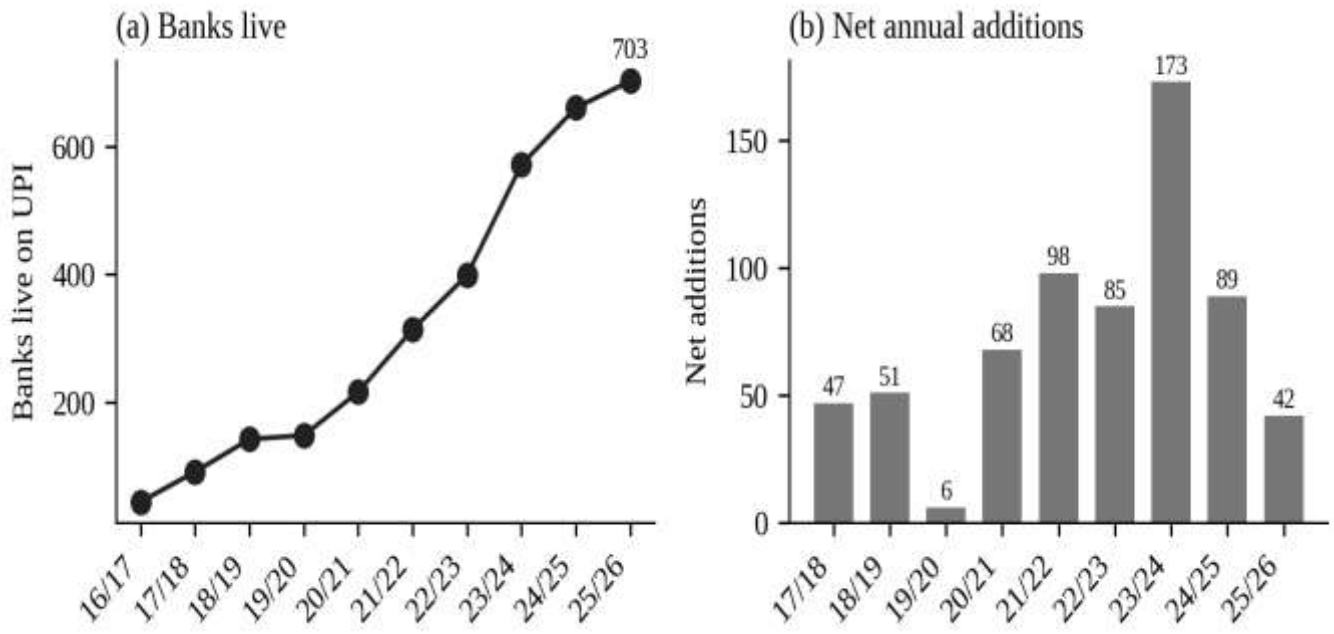


Fig. 4. Banks live on UPI (a) and net annual additions (b).

Taken together, UPI has passed through an introduction phase (2016-18), a rapid-adoption phase (2018-22) and a consolidation phase (since 2022). Future growth will depend less on adding banks and more on deepening use among people and places not yet reached.

5. Major Challenges

The growth data do not measure challenges directly, so this section draws on official and published evidence.

5.1 Challenges for users

- Fraud and social engineering: Reported UPI-related fraud cases rose from 4.07 lakh in 2021-22 to 13.42 lakh in 2023-24 and were 12.64 lakh in 2024-25; the amount involved was ₹242 crore, ₹1,087 crore and ₹981 crore respectively (BOOM, 2026). Relative to activity this is small, about one case per 4 100,000 transactions, but it is probably under-reported: a LocalCircles survey found that 51% of fraud victims did not file a complaint (Business Standard, 2025). Because UPI payments are instant, money is hard to recover once a user has been tricked into authorising it.
- Low digital and financial literacy. Many first-time, older and rural users find it hard to verify a payee, protect a PIN or tell a collect request from a payment, which raises both fraud risk and reluctance to adopt.
- Connectivity and language. Reliable data, a smartphone and electricity are prerequisites, and coverage gaps and language barriers still exclude some users.
- Failed transactions and grievance redressal. Debits without credit and delayed reversals reduce trust. Complaints are often spread across the app, the bank and the system operator, with unclear accountability.

5.2 Challenges for banks, merchants and providers

- Outages. NPCI reported intermittent technical issues causing partial declines on 26 March, 2 April and 12 April 2025 (The Wire, 2025). With about 66 crore transactions a day, even short disruptions affect millions of people.
- Concentration risk. In November 2024 PhonePe and Google Pay handled about 85% of UPI volume. NPCI's 30% volume cap for any single app has had its deadline extended repeatedly, most recently to 31 December 2026 (Business Today, 2024).
- Sustainability of the business model. UPI has carried no merchant discount rate (MDR) since January 2020, while banks and providers bear technology, security and dispute costs; the government has funded incentive

schemes of ₹1,389 crore in 2021-22 and ₹2,210 crore in 2022-23 (Deccan Herald, 2025). A 0.4% MDR on selected merchant payments above ₹2,000 was planned from 15 October 2026 but was deferred until after Diwali (The Federal, 2026).

- Fraud-management and security costs. Banks and providers must keep investing in fraud detection and compliance, which smaller institutions find especially heavy.

6. Future Prospects and Suggestions

- Strengthen fraud prevention. Real-time fraud analytics, delays or limits for first-time and high-risk payments, payee-name verification and faster freezing and recovery.
- Invest in literacy. Multilingual, community-level training and simple in-app warnings for new and older users.
- Improve reliability. Capacity planning, redundancy, stronger standards for smaller banks, and published uptime and success-rate data.
- Reduce concentration. Encourage competition among apps and fair access for new entrants.
- Clarify the funding model. A transparent framework that rewards the participants who bear costs without discouraging small merchants and users.
- Deepen inclusion. Rural and low-bandwidth options, voice and regional-language interfaces.
- Strengthen grievance redressal. A single, time-bound complaint pathway across apps and banks.
- Extend beyond borders. UPI's open design offers scope for cross-border remittances and merchant payments.

If recent trends continue, volume and value will probably keep growing but more slowly, with usage per person and the range of use cases, rather than the number of banks, becoming the main source of expansion.

7. Limitations and Further Research

The study uses national yearly totals from official sources, so it cannot separate UPI person-to-person from person-to-merchant payments over time or compare UPI with other payment modes. Averages are derived from published figures and recent data may be revised. The challenges are described qualitatively from published evidence, and fraud data are partial and affected by changes in reporting rules. Future work could use monthly or state-wise data, user surveys and statistical tests of the effect of bank onboarding on usage.

8. Conclusion

UPI has grown on an extraordinary scale: volume from 1.78 crore to 24,162 crore transactions, value from ₹0.07 to ₹314 lakh crore, and banks from 44 to 703. Growth rates have fallen steadily since 2021-22 while absolute additions stay large, which indicates a maturing system. The falling average value per transaction shows that UPI has become part of routine small-value commerce. The challenges that could limit future growth are fraud and social engineering, literacy and access gaps, technical reliability, concentration of providers, an unsettled business model and weak grievance redressal. Meeting them is essential to turn scale into trust.

9.Refferance

Alonso, C., Bhojwani, T., Hanedar, E., Prihardini, D., Uña, G., & Zhabska, K. (2023). *Stacking up the benefits: Lessons from India's digital journey* (IMF Working Paper No. 23/78). International Monetary Fund. https://doi.org/10.5089/9798400240416.001

BOOM. (2026). *UPI fraud cases and losses rise over five years; Finance Ministry tells Lok Sabha*. https://www.boomlive.in/web-stories/india/upi-fraud-cases-and-losses-rise-over-five-years-finance-ministry-tells-lok-sabha-2755

Business Standard. (2025, June 26). *1 in 5 UPI users faced fraud; 51% victims didn't report, reveals survey*. https://www.business-standard.com/finance/news/upi-transaction-fraud-india-survey-one-in-five-users-hit-localcircles-125062601141_1.html

Business Today. (2024, December 31). *NPCI extends 30% UPI market share cap deadline on 3rd party apps to December 2026*. https://www.businesstoday.in/tech-today/news/story/npci-extends-30-upi-market-share-cap-deadline-on-3rd-party-apps-to-december-2026-459171-2024-12-31

Chodorow-Reich, G., Gopinath, G., Mishra, P., & Narayanan, A. (2020). Cash and the economy: Evidence from India's demonetization. *The Quarterly Journal of Economics, 135*(1), 57–103.

Crouzet, N., Gupta, A., & Mezzanotti, F. (2023). Shocks and technology adoption: Evidence from electronic payment systems. *Journal of Political Economy, 131*(11), 3003–3065.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Deccan Herald. (2025). *Union Cabinet approves Rs 1,500 crore to incentivise low-value UPI transactions*. https://www.deccanherald.com/amp/story/india%2Funion-cabinet-approves-rs-1500-crore-to-incentivise-low-value-upi-transactions-3453376

The Federal. (2026, October). *UPI MDR rollout deferred until after Diwali: What consumers and merchants need to know*. https://thefederal.com/category/business/upi-mdr-charges-deferred-until-after-diwali-259449

Government of India. (2022). *Economic Survey 2021-22: Statistical appendix, Table 3.6*. Ministry of Finance. https://indiabudget.gov.in/budget2022-23/economicsurvey/doc/stat/tab36.pdf

Jack, W., & Suri, T. (2014). Risk sharing and transactions costs: Evidence from Kenya's mobile money revolution. *American Economic Review, 104*(1), 183–223.

Lusardi, A., & Mitchell, O. S. (2014). The economics of financial literacy: Theory and evidence. *Journal of Economic Literature, 52*(1), 5–44.

Ministry of Finance, Government of India. (2026a, August 24). *UPI completes 10 years* [Press statement]. As reported in Business Today: https://www.businesstoday.in/india/story/10-years-of-upi-transaction-value-surges-4000-fold-to-reach-rs314-lakh-crore-550975-2026-08-24

Ministry of Finance, Government of India. (2026b). *Written reply in the Lok Sabha on UPI transaction volume and value, 2021-22 to 2025-26*. As reported in Outlook Money: https://www.outlookmoney.com/banking/upi-transaction-value-reaches-rs-314-lakh-crore-in-fy26-govt-says-in-lok-sabha

Patil, P., Tamilmani, K., Rana, N. P., & Raghavan, V. (2020). Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal. *International Journal of Information Management, 54*, 102144.

Sivathanu, B. (2019). Adoption of digital payment systems in the era of demonetization in India: An empirical study. *Journal of Science and Technology Policy Management*. https://doi.org/10.1108/JSTPM-07-2017-0033

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

The Wire. (2025, April 13). *No clarity yet on reason for 'intermittent issues' behind yesterday's UPI outage*. https://m.thewire.in/article/banking/no-clarity-reason-intermittent-issues-upi-outage/amp

Yadav, V., & Das, A. (2024). *Digital payments in India — How demonetization and COVID-19 shaped adoption?* Indian Institute of Management Ahmedabad. https://iima.ac.in/publicationdigital-payments-india-how-demonetization-and-covid-19-shaped-adoption