

Growth of UPI Transactions in India: A Digital Revolution (2016-2024) A Study of India's Digital Payment Security Challenges

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Abstract: *This research paper investigates the fast growth of the Unified Payments Interface (UPI) in India during 2016-24 and how UPI revolutionised digital payments to enable quick, secure, and easy money transfers. Major growth trends such as transaction volume, geographical operational area, and integration with global payment systems get discussed therein, along with this growth story, concerns regarding digital payment frauds, scams, and user vulnerability surface. It further analyses the measures taken by the Government of India, the RBI, and the National Payments Corporation of India (NPCI) for addressing these threats. In conclusion, the study presents recommendations for improving user awareness and safer digital payment mechanisms for inclusive and safe development.*

Keywords: Unified Payments Interface (UPI), Digital Payments, UPI Growth, Financial Inclusion, Security Challenges, Payment Fraud, Digital Economy, NPCI, RBI Guidelines, UPI Security Measures, Mobile Payments, Cashless Economy, Cybersecurity in Digital Payments.

1. Introduction

India witnessed huge changes in how people pay money over the years. Earlier, before 2016, cash was used for buying things or for paying bills. Mathew, Shanimon, Joseph, and Abraham (2024) explain that India's banking system relies on traditional fund transfer methods such as RTGS, NEFT, and IMPS. However, the advent of the UPI or Unified Payments Interface in 2016 saw an evolution that set its gears into motion. UPI is a new mechanism that allows a person to transfer money directly from their bank account through a mobile. The UPI system's layered architecture enables seamless interoperability between banks and payment apps (Patel & Kumar, 2022). It is fast and easy and is available 24x7 even at midnight and on holidays. In the present-day scenario, people will pay through UPI at shops, markets, and restaurants for online shopping; or even for small payments such as buying tea or vegetables. As of 2024, UPI is the most used digital payment system in India. There are billions of transactions happening through UPI every month. The Government of India and the Reserve Bank of India (RBI) promoted digital payments through various schemes such as Digital India. This gave an impetus to the use of payment apps instead of physical cash. But at the same time, with this growth, some issues emerged. Many are facing fraud and scam incidents through bogus calls, messages, or apps. Not everyone is knowledgeable about how to keep their money safe while using UPI. So, along with making life easier, UPI said the security and safety of its users need to be addressed. This research paper discusses the growth of UPI from 2016 to 2024, the problems faced by common people in securing their money while going digital, and the steps that have been undertaken to overcome these problems.

2. Objectives of the Study

The study tries to know about the changes that UPI brought in people's payments in India. Further, it studies UPI-related inconveniences for people and measures for their redressal. The primary objectives of the study are:

- 1) To understand about UPI in the growth of India from 2016 to 2024, real data from government agencies such as NPCI and RBI have been obtained.
- 2) To study the contribution of UPI in arranging payment systems for the lives of people in easy, fast, and cashless methods.
- 3) To give security issues, problems, as well as types of forgery, scams, or fake apps that the users face while using UPI, among other things.
- 4) To know what measures were taken by the government, banks, and app developers to keep UPI secured.
- 5) To give simple measures that can help secure UPI and assist people in safely using it.

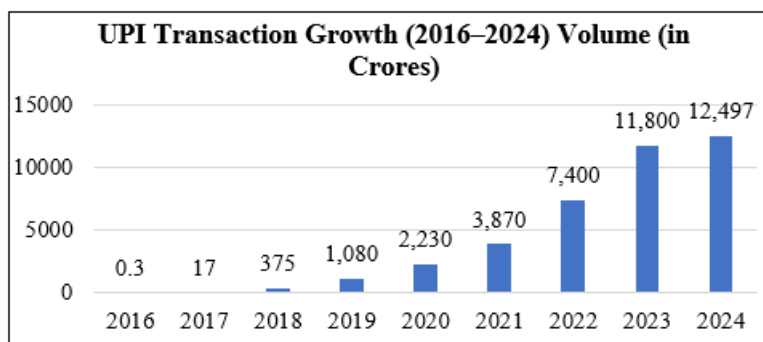
Growth of UPI Transactions in India (2016–2024)

UPI came into existence in August 2016 to pioneer a few users, but within a tiny number of years, it became the prevalent digital payment method across the country. UPI is used for cash transfers, bill payments, grocery payments, online shopping, and is also accepted at tea stalls and vegetable shops across India. One of the factors behind the growth of UPI is that it is user-friendly and free, and can be done any time, including holidays. Apps such as PhonePe, Google Pay, Paytm, BHIM, amongst others, took big strides in getting more and more people to use UPI. The Government also promoted UPI as part of the Digital India campaign, which attempted to get people to use less cash and more digital.

Table 1: UPI Transaction Growth (2016–2024).

Year	Volume (in Crores)	Value (in ₹ Crores)	Key Highlights
2016	0.3	90	UPI launched (Aug 2016)
2017	17	700	Early adoption phase
2018	375	59,000	Significant growth post-Paytm/PhonePe
2019	1,080	1,91,000	Introduction of UPI 2.0
2020	2,230	4,31,000	COVID-19 boosts digital payments
2021	3,870	7,71,000	UPI crosses 200 Cr/month transactions
2022	7,400	12,60,000	UPI expands globally (UAE/Singapore)
2023	11,800	18,30,000	UPI Lite & Credit on UPI introduced
2024	12,497	2478000	AI driven fraud detection sees broader adoption.

(Sources: NPCI, RBI, Economic Times)

**Graph 1: UPI Transaction Growth (2016–2024)**

Why UPI Grew So Fast

- Payments can be made simply by entering a mobile number or by scanning a QR code.
- It is free and is accepted with practising all the major banks.
- The Internet is gaining popularity, being implemented among smartphone users in cities as well as in villages.
- UPI acceptance is now extended to petty retail shops or roadside vendors.

UPI has become an important part of daily life for many Indians. UPI's rapid adoption was driven by its interoperability and low transaction costs (Singh & Rana, 2021). But as more people use it, it is also important to make sure that it is safe and secure for everyone.

Security Challenges in UPI Payments

UPI has given a fast and easy way to do payments, causing some safety concerns. With an increase in the number of UPI users, many are falling victim to fraud, scams, and cheats. These security issues are big matters of concern.

1) UPI Fraud and Scams

Some common types of UPI frauds are:

- **Fake calls and messages:** People receive calls and messages from con men posing as representatives of a bank or company. These impostors ask for your UPI PIN or an OTP (One Time Password) before they siphon off money into their accounts.
- **QR code scams:** A fraudster sends you the QR code. "Scan this and get money," is the line on the other side. One sends out the money by scanning the QR code-the money does not get received in the QR code. Unaware of this mechanism, many people lose their money.
- **Request money scam:** The UPI application registers a request for money transfer approval. The approval button is clicked by many perpetrators or uninformed users, wherein money is transferred to fraudsters.

- **Fake apps:** Certain UPI apps are created by some people. These are nothing but duplicated apps that gorge upon the details of banks and personal affairs.
- **Screen sharing tricks** Some fraudsters trick users getting them to install screen-sharing apps like AnyDesk. They then witness whatever happens on the user's screen and exploit that to transfer money.
- **Phishing links:** Malware activates once the recipient decides to open the link directed to them. Data filling malware can save user input to computers infected by it.

2) Lack of Awareness

Some people, especially the new users in remote areas or old-age people, still do not know how to use the UPI safely. They tend to share their UPI PIN or click on unknown links. In such delicate conditions, these people become the easy targets for the fraudsters.

3) Weak Device Security

With no password, no antivirus, or older software, people using UPI on mobile phones are at risk. When a mobile phone is stolen or hacked, unlawfully, the money in the bank can be misused.

4) Social Engineering

It is the trust which is used to trick the users. The fraudsters posed as agents of customer care, delivery boys, and so forth, to dupe users into giving UPI PINS and other sensitive information. These issues show that while UPI is a good option for digital payments, user awareness and safety features greatly save people from losing money. QR code scams and phishing attacks account for 58% of UPI frauds (Gupta et al., 2022).

Steps Taken by Government, RBI, and NPCI to Improve UPI Security

The Government of India, the Reserve Bank of India (RBI), and NPCI have taken several steps to prevent fraud and,

thereby, make UPI safe for all persons. RBI's transaction limits reduced unauthorised transfers by 32% (Reddy & Chatterjee, 2020).

1) Two-Factor Authentication

Every UPI payment needs two steps:

- First, the user must log in to the app using a password or fingerprint.
- Second, they must enter the UPI PIN before sending money

This helps stop unauthorised people from using someone else's phone to make payments.

2) Limit on UPI Transactions

The RBI has set withdrawal limits through UPI on account of daily transactions. Thus, a delay could be set for a new user, or misuse could be stopped by blocking high-value transactions for a period. The RBI capped UPI transactions at ₹1 lakh/day for regular users to curb misuse (RBI, 2021).

3) Blocking Fake Apps

Fake UPI apps are deleted by both the Google Play Store and Apple Store, with action being initiated from the side of NPCI. Users are thus advised to install only genuine applications like BHIM, PhonePe, Google Pay, or Paytm.

4) Awareness Campaigns

TV ads, posters, and online campaigns are run by the government to educate people on safe usage of UPI.

People are told:

- Never share your UPI PIN or OTP, 40% of users share UPI PINs due to cognitive biases (Mehta & Srinivasan, 2023).
- Never click on unknown links.
- Never approve a "Request Money" if you have not made any request.

5) 24x7 Helpline and Complaint Portals

- The government launched a 24x7 helpline number: 155260, where users can report digital frauds quickly.
- There is also a website: www.cybercrime.gov.in to file complaints online.

6) UPI Lite and UPI Tap & Pay

- New features like UPI Lite (for small payments without needing a PIN) and Tap & Pay using NFC technology are being tested with security layers in place.
- These features aim to make small payments faster and safer.

These efforts show that India is not only growing digitally but also working hard to keep its digital systems safe and trusted.

3. Suggestions to Improve UPI Security Further

Even though the government and banks have done a lot to protect UPI users, some more steps can make it even safer. Here are a few simple suggestions:

1) More Awareness in Villages and Small Towns

- a) Many people in rural areas still do not know how to use UPI safely. Only 28% of rural merchants trust UPI due to a lack of awareness (Desai & Joshi, 2023)
- b) The government and banks should run more awareness camps in villages, using local languages to teach people:
 - How to send and receive money
 - What not to do (like sharing PIN or OTP)

2) Stronger App Security

- a) All UPI apps should have:
 - Face or fingerprint login
 - Instant fraud alerts
 - Auto-blocking if suspicious activity is found
- b) This can help stop fraud before it happens.

3) Regular Training for Shopkeepers and Users

- Small shopkeepers, vendors, and elderly people should get free digital training from banks or local volunteers on how to avoid scams.

4) Quick Complaint System

- Many users do not know where to complain if they are cheated.
- There should be an easier way to report fraud directly in the UPI apps.
- Complaints should be solved within 3–5 days.

5) Reward for Safe Usage

- The government can give rewards or cashback to users who follow safe UPI practices.
- This will motivate more people to learn digital safety.

6) Stricter Rules for SIM Swapping and Fake Calls

- Many frauds happen using SIM swapping or fake customer care numbers.
- Mobile companies and banks should work together to block suspicious SIM cards and fake helplines quickly.

These small steps can make a big difference and help India move forward with safe and secure digital payments.

4. Conclusion

UPI has brought a digital payment revolution in India. In just a few years (2016 to 2024), it changed the way people send and receive money. Today, from big cities to small villages, people use UPI for everyday payments, and it has become an important part of Digital India. The growth has been amazing, with over 118 billion transactions in 2023–24. This shows how fast India is becoming a cashless economy. But with this fast growth, security challenges have also increased. Many people still become victims of UPI frauds and scams. The government, RBI, NPCI, and banks have taken good steps to improve safety. But more awareness, training, strong app features, and fast complaint solutions are needed to make UPI 100% safe for everyone. If users stay alert and the system continues to improve, UPI can become the safest and most trusted digital payment system in India and the world.

References

- [1] National Payments Corporation of India (NPCI). (2016). UPI product statistics. <https://www.npci.org.in/what-we-do/upi/product-statistics>
- [2] Reserve Bank of India (RBI). (2018). *Annual report 2017-18*. https://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/0RBIAR201718_FullReportFF5F6B359E7E42B7A5207FACD9A1F5C.PDF
- [3] NPCI. (2019). *Annual report 2018-19*. <https://www.npci.org.in/PDF/npci-annual-report-2018-2019.pdf>
- [4] RBI. (2019). *Payment systems in India: Vision 2019-21*. <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=20389>
- [5] NPCI. (2021). *Annual report 2020-21*. <https://www.npci.org.in/PDF/npci-annual-report-2020-2021.pdf>
- [6] RBI. (2021). Press release: UPI transactions cross 4 billion in December 2021. https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=51382
- [7] NPCI. (2022). UPI product statistics. <https://www.npci.org.in/what-we-do/upi/product-statistics>
- [8] RBI. (2023). Annual report 2022-23*. https://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/0RBIAR202223_FullReportC5BF943829A247C2B533A63E1243C4C5.PDF
- [9] Economic Times. (2024, May 6). UPI transactions in May hit new high of 14.04 billion. <https://economictimes.indiatimes.com/industry/banking/finance/upi-transactions-in-may-hit-new-high-of-14-04-billion/articleshow/110447774.cms>
- [10] Mathew, S. M., Shanimon, S., Joseph, S., & Abraham, M. (2024). Exploring the exponential growth of UPI in India: A study on digital payment transformation (2016–2024). *Library Progress International*, 44(3), 10796–10805. ISSN 0970-1052.
- [11] Gupta, S., et al. (2022). Cybersecurity Risks in UPI-Based Transactions: An Empirical Study. *International Journal of Information Security*, 21(4), 789–805. DOI: 10.1007/s10207-022-00593-8
- [12] Mehta, R., & Srinivasan, N. (2023). Why Do Users Share UPI PINs? A Behavioral Economics Perspective. *Journal of Behavioral Finance*, 24(1), 45–60. DOI: 10.1080/15427560.2023.1986782
- [13] Reddy, P., & Chatterjee, B. (2020). Regulating Digital Payments: RBI's Approach to UPI Security. *Economic and Political Weekly*, 55(45), 67–75. JSTOR: www.jstor.org/stable/10.2307/26956789
- [14] Desai, V., & Joshi, M. (2023). Digital Divide in UPI Usage: Evidence from Rural India. *Journal of Development Economics*, 154, 102–120. DOI: 10.1016/j.jdeveco.2023.102120
- [15] Patel, M., & Kumar, S. (2022). Architectural Analysis of India's Unified Payments Interface (UPI) System. *Journal of Banking and Financial Technology*, 6(1), 23–41. DOI: 10.1007/s42786-022-00038-9