An Analytical Study of UPI Fraud Detection in Online Transactions in India

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Abstract

Digital transaction platforms such as UPI, NEFT, RTGS and IMPS have become popular because they are fast and can be accessed from any place at any time. Online transactions are a simple financial activity used efficiently by all people. Along with their many benefits, online transactions raise issues such as fake payment links, QR code scams and unauthorised access. This paper reviews statistical data on the usage of online transactions and related fraud in India over the last five years. It presents the reasons for fraud in online transactions and the security measures used to control it, including cyber security awareness, secure authentication methods, government regulations and banking security measures. The study examines the safety and reliability of digital payment systems in India.

Keywords: Online transaction; fraud detection; fraud prevention; UPI

1 Introduction

In the modern digital period, online transactions play an important role for all users. Digital payments such as UPI, NEFT, RTGS, and IMPS are growing rapidly. It makes the transactions faster, easier, and more convenient because it is a very simple tool, has real-time processing, and has user-friendly features. These are online transaction platforms for fund transfers, shopping, bill payments, etc.

Along with the advantages of digital transactions, the cyber frauds and online transaction crimes are also growing. Online transaction fraud uses various techniques such as fake payment links, QR code scams, identity theft, account hacking, unauthorized access to accounts, and social engineering attacks.

This study analyses online transactions and fraud detection in India over the last five years, the reasons for fraud in online transactions, and the fraud detection systems used to reduce online transaction crimes and prevent fraud.

1.1 Scope of the study

This study focuses on analysing online transactions and their fraud detection methods, highlighting the major reasons for fraud in online transactions and the tools used for fraud detection and prevention.

The study also aims to understand the significance of security measures and models that ensure safety in online transactions.

2 Common types of online transaction fraud

1. **OTP and UPI PIN theft:** This is the most widespread online transaction fraud, in which cybercriminals trick end-users into sharing their PINs or OTPs through contact platforms using fake identities.
2. **Phishing fraud:** Fraudsters send fake links, e-mails and SMS messages to gain access to end-users' payment apps or online banking.
3. **QR code scam:** End-users scan fake QR codes, which transfer money to unauthorised bank accounts.
4. **Mule accounts:** Cybercriminals use fake bank accounts to transfer stolen money.

According to the survey, more than 8.5 lakh mule accounts used in cyber fraud were identified by the CBI.

3 Major reasons for the growth of fraud in online transactions

- Users lack awareness of online transaction frauds.
- UPI transactions are growing rapidly.
- Users use weak passwords and PINs.
- Delaying the reporting of fraud cases, or neglecting to report them, can exacerbate the issue.

4 Fraud detection techniques

1. **Artificial intelligence (AI) and machine learning:** AI systems are used to detect fraud in online banking transactions. They immediately flag large transactions, issue alert messages after multiple failed login attempts, and notify the user of transactions from unknown devices.
2. **Multi-factor authentication:** Multi-factor authentication, which combines a PIN, password, pattern and similar factors, should be implemented to secure online transactions and payment apps.
3. **Real-time transaction monitoring:** Every bank transaction is monitored to block illegal or unauthorised activities.
4. **Cybercrime reporting portals:** Banking crimes or frauds can be reported on RBI or government platforms.

5 Survey report of online transactions and UPI fraud in India

5.1 Growth of online transactions in India

According to the Ministry of Finance report, online transactions in India have grown rapidly during the past five years (Table 1). UPI is the most widely used online payment system in India, processing billions of transactions every month.

Table 1. Growth of digital transactions in India, 2020–21 to 2025–26.

Financial year	Total digital transactions (crore)	Transaction value (₹ lakh crore)
2020–21	4,370.68	1,414.58
2021–22	7,197.68	1,744.01
2022–23	11,393.82	2,086.85

Financial year	Total digital transactions (crore)	Transaction value (₹ lakh crore)
2023–24	16,443.02	2,428.24
2024–25	22,167.90	2,330.72
2025–26*	24,161.69	3,114.00

*Till March 2026.

5.2 Increase in UPI frauds

As online financial transactions increase, UPI fraud cases are also growing (Table 2). The number of reported fraud cases more than doubled between 2021–22 and 2022–23.

Table 2. Reported UPI fraud cases and amount involved, 2021–22 to 2024–25.

Year	Reported UPI fraud cases	Amount involved
2021–22	4.07 lakh	₹242 crore
2022–23	7.25 lakh	₹573 crore
2023–24	13.42 lakh	₹1,087 crore
2024–25	12.64 lakh	₹981 crore

5.3 Key findings

The key findings for the different categories of online transactions are summarised in Table 3.

Table 3. Key findings on online transactions and UPI fraud.

Category	Key findings
Online transactions	In India, online transactions are increasing continuously year by year.
	Nearly 81–85% of people in India use UPI accounts.
	According to the Survey 2025–26, India is the world's largest user of UPI.
	Both rural and urban areas of India use digital payment apps in large numbers.
	UPI accounts for 98–99% of digital transaction volume in India.
UPI fraud	The number of reported UPI fraud cases in India has grown rapidly.
	According to the survey, fraud cases increased threefold within three years.
	Financial losses in UPI due to digital fraud are increasing.
	Fraud volumes are increasing, but the number of cases has declined.
	The major causes of fraud are fake payment links, QR code scams, OTP fraud, unauthorised financial access and phishing.
	A lack of cyber security awareness among users leads to the growth of online transaction fraud.
	Greater usage of UPI and internet banking also leads to UPI fraud.
	Fraud prevention measures include multi-factor authentication, AI-based fraud detection systems, strong PINs or passwords, and awareness programmes.

6 Conclusion

India has moved rapidly to online transactions and the digital economy, and this rapid increase in online transactions has led to a rise in cyber fraud. According to the survey, online transactions are growing rapidly, and fraud is increasing along with them. Hence, the cyber police and investigators use effective fraud detection systems such as real-time monitoring and AI and machine learning, together with security measures to ensure safe digital transactions. Awareness programmes are also being conducted to reduce UPI fraud.

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