



Unified Payments Interface (UPI) – Digital Future of India

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ABSTRACT

The demonetization and digital India initiatives have given the Indian banking sector more impetus to continue pushing for the widespread use of digital payments. The "Unified Payment Interface (UPI)," which was introduced by the "National Payment Corporation of India (NPCI)" to enable digital payments, is a fantastic, updated, and reasonably priced innovation that makes digital payment services available to everyone. The adoption of mobile payment services by smartphone users, financial institutions, and banks has been signalled by the proliferation of smartphones, technological advancements, and efficient internet communications.[1] An outline of UPI's beginnings, growth, and progress is given in this article. The main advantages and characteristics of UPI are also covered in the essay, along with some of the problems and issues that the system raises. Ultimately, a review of UPI's prospects for the future rounds off the article. [2]

Key words: Unified Payment Interface, Digital Payments, NPCI, India

INTRODUCTION

Significant structural changes are currently being implemented in India's banking sector, along with increased use of information and communication technology (ICT). It has significantly changed the financial industry, moving from a paper-based to a virtual one and enabling safe, quick money transfers across bank accounts. Additionally, ICT made it possible for a range of electronic payment methods, also known as digital payment services, of which UPI (Unified Payments Interface) has become more and more well-known. Using a smartphone, users can carry out a range of financial transactions with this e-payment system.

One can send and receive money on the UPI network without disclosing bank account information by using a virtual payment address (VPA). [1]

Nevertheless, users need to register on the UPI app and have a bank account in order to make UPI payment transactions. A point of sale (PoS) computer and a current account are prerequisites for commercial entities. Among the UPI Apps are SBI Pay, Union Bank UPI App, Phonepe, G-Pay, BHIM Axispay, and WhatsApp Pay. Currently, every bank and fintech company uses their separate mobile applications to run the Unified Payment Interface service. [1]

HISTORY

The National Payment Corporation of India (NPCI) was established in April 2009 with the goal of integrating and standardising India's payment systems for all retail transactions. In March 2011, the Reserve Bank of India discovered that, despite 10 million businesses accepting card payments, an individual person in India conducted just six non-cash transactions annually. Approximately 145 million households lack access to any kind of banking. Dealing with corruption and black money, which primarily occurs in cash, is another issue. [2]

In 2012, the Reserve Bank of India (RBI) published a four-year vision statement outlining its commitment to constructing an authorised, interoperable, safe, efficient, accessible, and inclusive payment and settlement system in India. The Green Initiative includes a plan to reduce the amount of paper used in the domestic payments sector. 2016 saw the official public release of UPI. [2] The main organisation entrusted with creating a modern, easy-to-use, secure, and interoperable payment system was the NPCI, operating under RBI guidelines. UPI operates on a four-pillar push-pull interoperable model in which the users' financial transactions are settled by a remitter/beneficiary back-end bank and a front-end PSP (payment service provider). The CEO of Net magic Solutions claims that UPI has emerged as one of India's most successful deep-tech innovations.[2]

Noting UPI's performance in December 2019, Google recommended the Federal Reserve Board use UPI as a model for Fed Now, a real-time payment system for the US.

According to research from ACI Worldwide and Global research, India surpassed China and the United States to become the world's largest real-time payment market in 2020 with 25.50 billion yearly transactions, because to the rapid expansion of UPI. [2] According to the Economist Intelligence Unit Report 2021, South Korea, China, and India are now the top three countries in the world for real-time payments because to UPI. The Ministry of Finance's decision to abolish the merchant discount rate (MDR) from UPI in 2019 caused a sharp increase in the volume of low-value transactions, which significantly increased real-time transaction volume statistics. Countries like the United States, Singapore, Bahrain, Saudi Arabia, Brazil, and the European Union are currently attempting to imitate UPI's success in their own markets.[2]

The Immediate Payment Service (IMPS) platform, which was originally created by the NPCI, serves as the foundation for UPI. Customers can use their mobile phones to swiftly transfer money between bank accounts thanks to UPI. A distinct virtual payment address (VPA), connected to a customer's bank account, is used by UPI. To get paid, users can make their own VPAs and share them with others. Customers can pay with UPI by using a mobile phone number or by scanning QR codes. [2]

POSITION OF UPI IN INDIA’S DIGITAL PAYMENT ECOSYSTEM

The payer (initiator), receiver (accepter), acquirers (receiver's bank), and issuers (payer’s bank) make up the digital payment ecosystem. A system that links all these parties via paperless fund transfers or modes of payment is known as a digital payment ecosystem. The RBI database states that the digital payment ecosystem in India consists of several digital payment instruments, including M-Wallets, Prepaid Payment Instruments (PPIs), Unified Payment Interface (UPI), AADHAR-enabled payment systems (AePS), Unstructured Supplementary Service Data (USSD), Internet Banking (NEFT, IMPS, and RTGS), and banking cards (debit/credit cards). Based on the latest RBI data from May 2021, UPI is responsible for 2.53 billion transactions, or 58.47 percent, of all digital payment transactions.

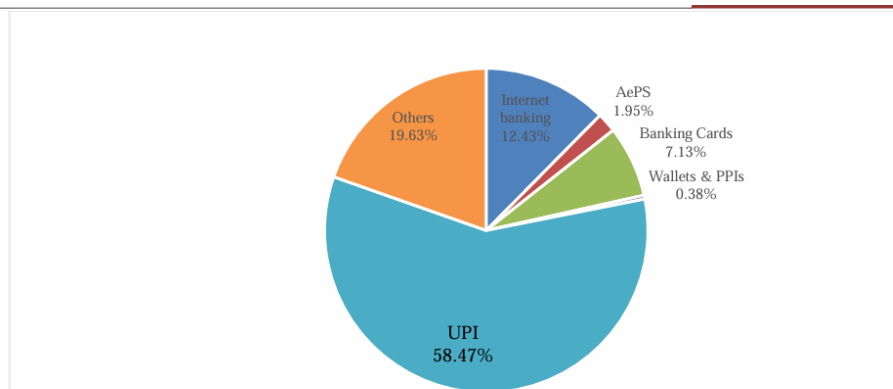


Fig. 1: Digital Payment and Settlement System data of May, 2021 (in terms of volume of transactions)

More than half of all transactions made inside the digital payment ecosystem are now made using UPI, which was created to ease payment systems in retail digital payment transactions. As a result of the UPI payment system's maximum limit restriction of Rs. 2,00,000, RTGS and NEFT continue to lead in terms of value, accounting for 89.29% of all digital transactions in May 2021, totalling 104.52 trillion rupees.

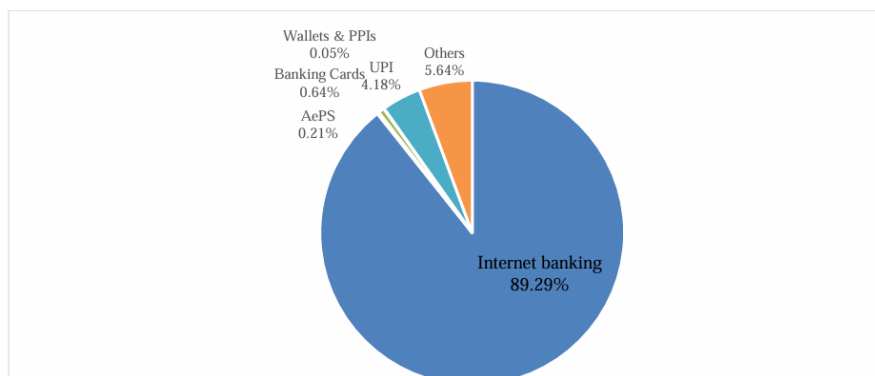


Fig. 2: Digital Payment and Settlement System data of May, 2021 (in terms of value of transactions)

ADVANTAGES

A. Advantages for Financial Institutions

- [1]. Give two-step verification just one click.
- [2]. provides a transaction application for Universa.
- [3]. Present a creative, safe, and secure image.
- [4]. Payment basis using a unique ID [3]

B. Advantages for Clients

- [1]. Provide a gateway to many bank accounts.
- [2]. Since a virtual ID doesn't involve password exchange, it is more secure.
- [3]. Authentication with just one click.
- [4]. Report any issues you may be having with the mobile app directly. [3]

C. Advantages for Retailers

- [1]. The customer's UPI ID is not at risk when stored on the cards.
- [2]. Money is retrieved from customers with a single identity.
- [3]. Customer Facilities: One click provides a seamless pull. money transfer through the app. [3]

CHALLENGES

- A. Security and Fraud Prevention: - Despite the strong security precautions that UPI has in place, there is still a chance of fraud and unauthorised transactions. Cybercriminals can obtain sensitive data by using social engineering techniques or by taking advantage of system flaws.[4]
- B. Transaction Limits: - Transaction restrictions are imposed by UPI on the quantity of transactions as well as the number of transactions. These restrictions may be burdensome for companies and individuals that need to transact more frequently or with bigger sums of money, even if they are meant to maintain security and prevent abuse.[4]
- C. Awareness and Education: - The general acceptance of UPI is still hampered by a lack of knowledge and comprehension of it, especially among those who are unfamiliar with digital payment methods.[4]
- D. Customer Support: - Any payment system must have quick customer service and effective grievance redressal procedures to gain users' trust and confidence. Problems including unsuccessful transactions, erroneous debits, or refund delays might happen to UPI users.[4]

CYBER ATTACKS IN UPI

Many con artists take advantage of consumers who don't know that using a UPI platform to receive money does not require scanning a QR code or entering a UPI pin. [5]

The hackers trick users into entering their UPI pin and scanning a QR code to collect a prize, which results in fraud on the UPI platform. [5] Numerous unreliable apps that are downloaded from the Google Play store could access all financial information on the phone and retrieve phone data, which can result in UPI frauds. [5] Through emails or SMSs, scammers send consumers unauthorised links; when they click on these links, frauds are committed. [5]

FUTURE

India has built a sizable, safe, effective, and scalable public digital infrastructure, laying the groundwork for a powerful "Digital Payments Revolution." This strong infrastructure paves the way for advancements that may completely transform digital payments globally.[6]

- A. Tokenisation of Cards: - Tokenization of cards is one of the innovations that could improve UPI. This technique improves transaction security by substituting a unique identifier, or "token," for sensitive payment information.[6]
- B. Offline Payments and e-RUPI: - By enabling offline payments, UPI improves usability and guarantees that transactions can take place even in places with poor connectivity. Targeted service delivery is also expected to change because of e-RUPI, a voucher-based payment system.[6]
- C. Digital Currency Integration: - It is projected that UPI's integration with digital currencies will be a big advancement, enabling smooth and international transactions. This development is in line with how the finance industry is changing.[6]
- D. Cross-border Transactions and Toll Tax Collection: - UPI's future expansion is facilitated by its extension for cross-border transactions and toll tax collection, which also increases the effectiveness of toll tax operations and expedites international payments.[6]
- E. Buy Now, Pay Later (BNPL): - BNPL is turning into a payment method that changes everything. It is anticipated that UPI will adjust and incorporate BNPL features, offering consumers a range of flexible payment choices and advancing financial inclusion.[6]

SOLUTIONS

The Unified Payment Interface (UPI) offers a transformative solution for India's digital payment landscape. By leveraging smartphones and robust internet infrastructure, UPI enables secure, swift, and accessible financial transactions through virtual payment addresses. It bridges gaps in financial inclusion, reduces dependency on cash, and enhances transaction efficiency. However, addressing challenges like security risks, transaction limits, and user awareness is crucial for sustained growth. Future innovations such as tokenization, offline payments, and integration with digital currencies can further bolster UPI's impact, making it a model for global digital payment systems.

CONCLUSION

In conclusion, the Unified Payment Interface (UPI) has significantly advanced India's digital payment ecosystem, promoting financial inclusion and reducing reliance on cash transactions. Despite challenges such as security risks and the need for increased user awareness, UPI's continuous innovations and widespread adoption position it as a cornerstone for India's digital financial future and a model for global payment systems.

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