

Strategies and Challenges of Unified Payment Interface

Towards Facilitating a Digital Payments System in India

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Abstract: The Indian economy is gradually curtailing its overdependence on currency-based transactions and thereby moving closer to digital and mobile-based payment transactions. The main objective of the paper is to provide an in-depth theoretical understanding of the Unified Payments Interface (UPI), its current pace of growth and the possible future penetration based on polynomial trendline projection, the possible challenges that limit future penetration, and the various strategies to overcome these challenges. The paper used the previous six years' UPI penetration statistics from 2016 to 2017 and established trends using polynomial trendline equation for the purpose of anticipating future penetration. The study also used statistics from published reports of the Reserve Bank of India (RBI) and the National Payment Corporation of India (NPCI) to draw meaningful conclusions on future UPI penetration. The study finds that the targeted one billion UPI transactions per day is achievable. The article contributes towards applied research by providing a decision-making tool to support policymakers, the government, and payment service providers, among others. Strategic applications of this research outcome include Unified Dispute and Issue Resolution processes, the RBI's lapse management, customer protection measures, UPI limit management, expansion of Internet user base and promoting digital financial inclusion in India.

Keywords: Unified Payments Interface, digital payments system, polynomial trendline projection

Introduction

India is the world leader in terms of the volume of digital transactions, with 48.6 billion in the year 2021, has surpassed China by almost three times and is higher than the combined volume of digital transactions of the US, UK, Canada, France and Germany ([ACI Worldwide & Centre](#)

[for Economics and Business Research \(CEBR\), 2022](#)). India's real-time digital payment transactions volume stood at 31.3% of total payment transactions in the year 2021. The widespread adoption of digital payments in India benefited consumers and business entities, with an estimated cost savings of USD12.6 billion, which was almost .56% of the country's GDP in 2021 ([Centre for Economics and Business Research \(CEBR\), 2022](#)). The CEBR report forecast that the contribution of digital payments towards India's GDP could grow to US\$45.9 billion (1.12% of GDP) by 2026. India is the third fastest-growing real-time digital payments market in the world economy with a weighted average growth rate of 33.5% annually, behind Brazil (56.8%) and Oman (41%). The CEBR report also highlighted the role played by Unified Payments Interface (UPI) in facilitating the widespread acceptance of real-time digital payments among Indian users.

Although India is the global leader in real-time digital payments, the currency circulation in the Indian economy increased rapidly from USD199.12 billion (16.42 lakh crore) ([Gochhwal, 2017](#)) during the time of demonetisation in November 2016 to USD366.70 billion (30.35 lakh crore) ([RBI, 2022](#)) in October 2022. There was an increased penetration of 85% during the period. One of the main objectives of demonetisation was to reduce overdependence on paper currency in the Indian economy. However, the data released by the Reserve Bank of India (RBI) shows that dependence on paper currency is gradually increasing ([RBI, 2022](#)). Since overdependence on paper currency is not good for any economy, the RBI and the Indian Banking Association (IBA) jointly established the National Payment Corporation of India (NPCI) to promote digital payments in India. Since the introduction of the NPCI, the digital payments industry in India has undergone rapid growth during the last decade and continues this pace of penetration. As part of India's 'Digital India' campaign, the active Internet-enabled smartphone user base stands at 829 million ([KPMG, 2021](#)) and the total volume of digital transactions reached the benchmark level of 72 billion ([RBI, 2022](#)) with 64% of these transactions conducted through the UPI during the 2021–22 financial year. The high smartphone penetration in India is paving way for mobile-based payment systems. Since only 60% of India's population use smartphones and the currency circulation in India is still consistently increasing, there is still substantial room for further penetration of digital payments and the consequent achievement of digital financial inclusion.

The subsequent sections of this paper shed light on the available literatures relating to the role of UPI in facilitating the digital payments system in the Indian economy, the theoretical background and the possible penetration of UPI and other digital payment modes. The last section of the paper deals with the various strategies to overcome the possible challenges that need to be taken by the policymakers for achieving the targeted one billion UPI transactions per day by the 2026–27 financial year.

Literature Review

The digital payments system's adoption of a cashless mode is yet to be widely and successfully adopted among consumers in emerging economies. Rahman *et al.*, (2020) find that Unified Theory of Acceptance and Use of Technology (UTAUT2) factors have significant influence on the adoption of cashless payments by consumers in developing economies. Shaikh *et al.* (2017) conceptualised a new mobile banking system called Mobile Based Payment System (MBPS) to overcome the challenges posed by the existing digital payment modes in developing economies, which include lack of convenience, scalability and usability. Pobee *et al.* (2023) studied the moderating effect of taxing the digital payments on the adoption of digital payments services in developing economies and found that taxing the digital payments services will negatively influence the adoption decision of consumers. The introduction of UPI fuelled acceleration and value addition to the existing digital payments sector of the Indian economy (Gochhwal, 2017). The UPI was introduced by NPCI and made publicly available through its indigenously developed BHIM (Bharat Interface for Money) UPI platform. The most widely used digital payment mode at the time of the introduction of UPI were e-wallets. The major drawback of digital or e-wallet-based digital payments was that one needed to add money to the wallet before making payments with no direct payments from the payer's bank account. The UPI-based payment technology primarily addressed this issue and allowed the payer to make payments directly from their bank account, thereby increasing competition in the digital payments industry to a cut-throat level (Bagla & Sancheti, 2018). The growth of UPI during its initial phase was moderate as there was only one NPCI-backed BHIM (a mobile-based UPI application) providing UPI services to banking customers in India. The entry of third-party application providers to the UPI ecosystem helped the rapid growth of UPI in India (Kumar *et al.*, 2022). UPI surpassed all other digital payment modes within three years of its official launch in terms of volume and value of transactions (Ahmed & Sur, 2023).

The existing literature on UPI focuses mainly on UPI theoretical background, various adoption determinants of UPI, customer satisfaction and use intention of UPI. Gochhwal (2017) studied the theoretical aspect of UPI and highlighted the convenience, cost-effectiveness and security of UPI as the key elements that drives users in adopting UPI. Kapur *et al.* (2020) developed a mathematical Bass model and empirically validated the model using the data collected from UPI users in India and found that word-of-mouth was the key determinant of UPI adoption in India. The UTAUT model and its extended versions are the most widely used models in the existing literature for measuring the adoption determinants of UPI (Mallik & Gupta, 2020). The study of Mallik & Gupta (2020) found that performance expectancy and perceived security were the major influencing factors when adopting UPI by customers. Fahad (2022) also studied the various determinants of UPI adoption in India and found that relative advantage,

complexity and observability were the key determinants of UPI adoption. The relative advantage of UPI over digital wallets, Internet banking and other digital modes of payments attracts more customers towards UPI ([Kuriakose et al., 2022](#); [Fahad, 2022](#)).

While analysing the current literature on UPI, it is evident that it focuses only on the basic theoretical background and functioning of UPI, and its various factors of adoption and usage using various existing models. There is a gap in the existing literature with regards to the measurement of the future penetration level of UPI, identification of the various challenges that might prevent future penetration and the strategies that need to be adopted to overcome these challenges. Therefore, this study attempts to bridge this gap by incorporating a trendline equation using the polynomial trendline method for measuring future penetration of UPI. The study also proposes strategies to overcome the possible challenges that might limit the future penetration of UPI.

UPI Theoretical Background

UPI

“Unified Payment Interface (UPI) is a single-window mobile payment system introduced by the NPCI in 2016 to promote mobile-based payments in India. UPI allows the payer to make payment directly to the payee’s UPI-linked bank account without providing any sensitive information about the payee such as bank account number, Indian Financial System Code (IFSC), account holder’s name, and branch code” ([Kuriakose et al., 2022, p.2](#)). UPI’s single-window mobile platform allows the customer to add multiple bank accounts and thereby merge several banking features, seamless fund routing and merchant payments ([National Payments Corporation of India, 2016](#)). The customer needs to enter only the UPI-registered mobile number or the UPI ID or QR code of the recipient to send the money. There are currently 358 banks live on UPI in India and 52 banks and 22 third-party players are providing their own UPI applications for their customers ([National Payments Corporation of India, 2022b](#)). UPI applications provided by these banks and third-party players can be downloaded from the relevant app stores by the users. These applications are developed by Payment Service Providers (PSPs), which are considered important players in UPI’s ecosystem. PSPs are the entities which are permitted to issue virtual addresses to the users and provide payment (credit/debit) services to individuals or entities, and are regulated by the RBI under the *Payments and Settlement Systems Act, 2007* ([BHIM UPI, 2016](#)). PSPs might be banks, mobile wallet providers, payment banks, or other third parties registered as PSPs in the RBI.

Basic features and unique advantages of UPI

The need for a new digital payments system arises only when there are shortfalls in the existing digital payment modes. The introduction of UPI is also a result of such shortcomings in convenience, ease of use, usefulness and affordability of existing digital payment modes. NPCI successfully addressed such shortcomings through the introduction of UPI. The basic features of UPI make it simple and effective to make mobile-based digital payments and distinguishes itself from other payment modes. These features help to increase the UPI adoption level among customers:

- **Functions in a mobile platform:** Mobile phones are used as the primary device to initiate all payments through UPI. UPI-enabled mobile application is installed in the user's personal mobile phone and thereby can add more than one bank account in this application and can perform transactions from the required bank account as an option for the customer. Increased smartphone penetration in India helps UPI to expand its customer base.
- **Multiple payment options available:** UPI has the facility to offer multiple payment options compared to other digital payment modes. Customers can pay using multiple identifiers of the recipient such as the unique virtual address of the recipient, account number with IFSC code, mobile number and scanning QR code. This facility in UPI relieves customers from entering recipients' sensitive information when initiating transactions.
- **One-click, two-factor authentication:** UPI uses two-factor authentication to safeguard customers' interests and thereby avoid security threats. The first authentication is at the time of login to the app. It is either the fingerprint or face ID or password of the mobile phone. The second-factor authentication is the UPI pin at the time of making the payment. Since there is a two-factor authentication with UPI, it is considered to be the most secured digital payments platform compared to other digital payment modes.
- **'Push' and 'pull' based transactions enabled:** UPI is the only mobile payment system that has the feature to initiate a transaction both from the side of the payer and the payee. A transaction that is initiated by the payer is called a push-based transaction and the transaction being initiated by the payee to request the payment from the payer is called a pull-based transaction.
- **Merchant and end user-friendly:** The UPI-based mobile payment system is highly merchant user-friendly as it allows the customer to make a payment by scanning the QR code displayed at the merchant shop, Internet, near field communication technology, Bluetooth, or any other standard protocol available in the UPI application.
- **Involvement of PSPs:** The UPI app that the end customer is using to make their UPI payments is developed and provided by PSPs. The PSPs might be a bank, a wallet provider,

a payment bank, or any other third-party software provider. The PSPs are given the freedom to add more functionality in their app by the RBI and NPCI to meet the customer's growing needs. Since, there are more than 40 PSPs operating under the UPI ecosystem in India, they will try to add more improvements to attract more customers to their platforms.

UPI towards facilitating a digital payments system

The targeted volume of total retail digital payments transactions for the 2017–18 financial year set by India was 25 billion (Balakrishnan, 2017), and currently the total volume of UPI transactions alone recorded 45.96 billion for the 2021–22 financial year (National Payments Corporation of India, 2022c). UPI has become the frontrunner in the mobile and digital payments sector in India and has overtaken all other digital payment modes in terms of volume in just two and a half years since its launch. UPI recorded 6.58 billion transactions accounting for USD131 billion, averaging about 212 million transactions per day in the month of August 2022 (Kashyap, 2022). According to Kashyap (2022), the target volume of UPI transactions by the 2026–27 financial year is set at one billion transactions per day which is almost five times higher than current levels. UPI has surpassed all other digital payment modes such as Immediate Payment Service (IMPS), debit card payments, credit card payments, prepaid payment instruments (PPIs), and national electronic fund transfer (NEFT) in terms of volume and value of transactions. The total volume of UPI transactions grew from 17.9 million in the year 2016–17, the launching year, to 45.9 million transactions during the 2021–22 financial year. The total value of these transactions grew from USD.84 billion to USD1.014 trillion (National Payments Corporation of India, 2022c) and 314 banks are live on the UPI platform. Table 1 draws the meaningful conclusion that the number of UPI transactions grew at an average of 200% annually over the past four years.

Table 1. UPI growth statistics

Financial year	Volume of transactions (in millions)	Value of transactions (in billions)	No. of banks live on UPI
2016–17	17.90	69	44
2017–18	915.20	1,098	91
2018–19	5,353.40	8,770	142
2019–20	12,518.60	21,320	148
2020–21	22,330.70	41,040	216
2021–22	45,956.10	84,160	314

Source: National Payments Corporation of India, *Product Statistics* (2022c)

The pace of growth of UPI transactions when compared to other digital payment modes is substantially high. The penetration level of UPI in India is facilitating the overall growth of digital payments and thereby enriching the reach of digital financial inclusion in India. The growth statistics of UPI provided by the NPCI's Product Statistics report highlighted the active

participation of banks when providing UPI services to its users ([National Payments Corporation of India, 2022c](#)). Banks are making increased efforts to expand the UPI services' reach to more targeted population. The participation of banks increased annually on an average of 52% over the past five years. The UPI holds 64% of the total volume of total digital payment transactions in India during the 2021–22 financial year ([RBI, 2022](#)). The penetration statistics of UPI from its month of launch shows UPI is the most influencing and facilitating digital payment mode in India's digital payments industry.

Methodology

The polynomial trendline equation method is a statistical method used to analyse and forecast trends in data that follow a nonlinear pattern. Polynomial trendline fits data to curves and these curves can be used to make projections and predictions about future values based on historical data points. It is widely used in existing studies to forecast projections of future penetration of various technologies and events based on previous years' data ([Balakrishnan, 2017](#); [Zhang & Jiang, 2021](#); [Saksono & Fulazzaky, 2020](#)). Balakrishnan (2017) adopted polynomial trendline equation to forecast the future penetration of digital payments in India and to check whether the targeted 25 billion retail digital payment transactions by 2017 are achievable. Other studies by Zhang & Jiang (2021) used a polynomial projection model to predict the future COVID-19 cases in China. Hence, polynomial trendline equation method is identified as the most suited method for projecting future penetration of UPI and other competing digital payment modes in India. Even though the pandemic played a crucial role in the increased penetration of UPI during the 2020–21 financial year, the growth rate of UPI during the post-pandemic period 2021–22 is more than that of the pandemic period of 2020–21. So, prediction using polynomial trendline equation is not affected by the growth of UPI during the pandemic period.

Results

Table 2 shows the pace of growth of UPI in terms of volume compared to other digital payment modes. The previous six years' performance of various types of digital payment modes such as IMPS, debit cards, credit cards, PPIs, NEFT, and NACH (National Automated Clearing House) are included in the table. The expected projection based on the polynomial trendline is also included in the table to understand whether the target of one billion UPI transactions per day can be achieved. The data shows that UPI surpassed all other digital payment modes within just three years of its official introduction. The weighted average growth rate of UPI comes to over 300% annually in terms of transactions. Since the published statistics on the number of UPI transactions is available on a monthly and yearly basis, the anticipated average future per-

day UPI transaction is arrived at by converting the yearly data into per day data. As per the polynomial trendline projection, the expected UPI volume after five years will reach 450 billion transactions, and the per day transaction will be around 1.21 billion. So, the polynomial trendline projection indicates that the target of one billion UPI transactions per day can be attained within the targeted five years by maintaining the current pace and trend of growth.

Table 2. Item-based transaction matrix and future projections for the next five years (figures in million)

Serial No.	Financial year	IMPS	Debit card	Credit card	PPIs	NEFT	NACH	UPI
1	2016–17	506.7	2,399.3	1,087.1	1,963.7	1,622.1	2,057.3	17.9
2	2017–18	1,009.8	3,343.4	1,405.2	3,459	1,946.4	2,503.3	915.2
3	2018–19	1,752.9	4,414.3	1,762.6	4,604.3	2,318.9	3,035.2	5,353.4
4	2019–20	2,579.2	5,061.1	2,177.3	5,381.1	2,744.5	1,694.2	12,518.6
5	2020–21	3,278.3	4,014.6	1,764.1	4,974.3	3,092.8	2,611.1	22,330.7
6	2021–22	4,662.5	3,938.7	2,239.9	6,581.2	4,040.7	2,951.8	45,956.1
Trendline-based projection for the next five years								
7	2022–23	5,139.31	4,897.64	2,464.91	7,334.95	4,223.35	2,820.97	98,361.74
8	2023–24	5,951.05	5,193.57	2,672.2	8,146.67	4,679.28	2,919.68	147,448.16
9	2024–25	6,762.79	5,489.49	2,879.5	8,958.39	5,135.22	3,018.4	211,571.6
10	2025–26	7,574.52	5,785.42	3,086.8	9,770.11	5,591.16	3,117.11	318,612.38
11	2026–27	8,386.26	6,081.34	3,294.1	10,581.83	6,047.1	3,215.82	441,827.67

Source: Data are drawn from the RBI's Annual Reports from 2018–19 and 2021–22 (RBI 2021; RBI 2022)

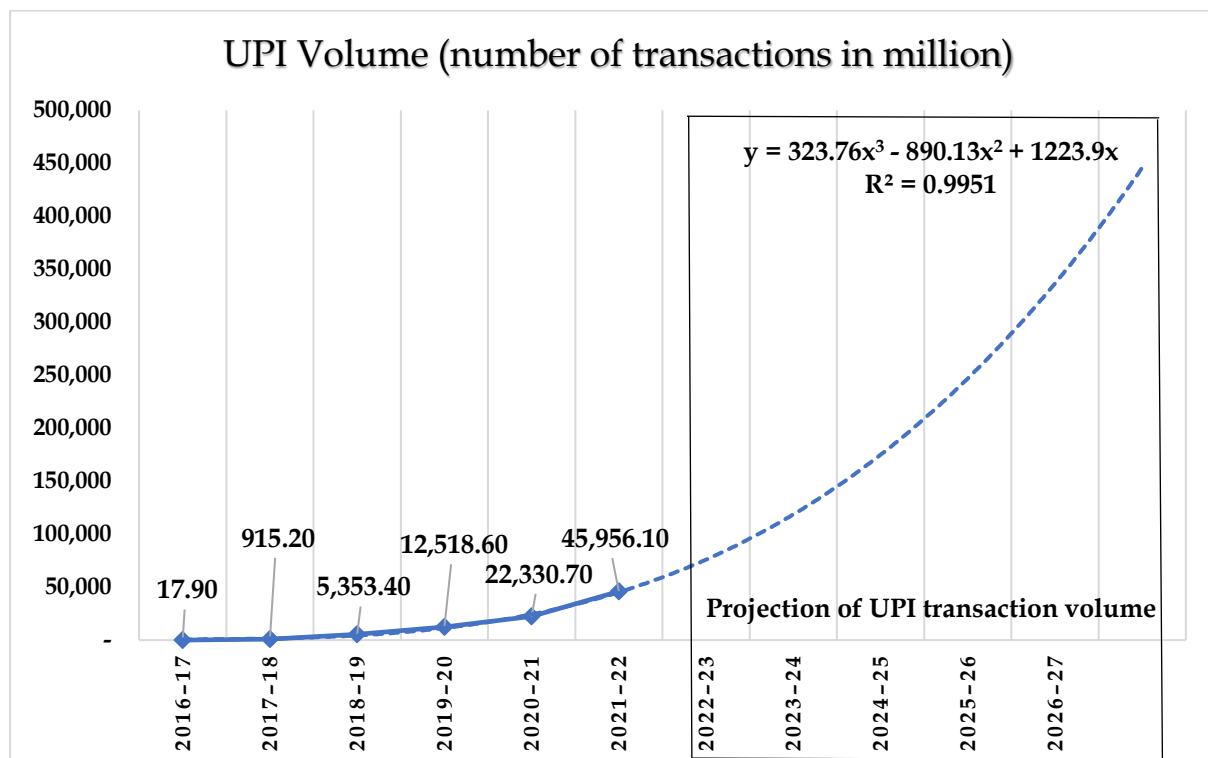


Figure 1. UPI transaction volume statistics with projections

Figure 1 shows the historical statistics of UPI volume penetration for the past six years and the trendline projection of UPI transaction volume for the next five financial years. The projections are based on the polynomial trendline equation as it is the trendline that best fits

the projection with an R-square value of 0.9951. The results of the polynomial trendline projection show that the UPI volume will reach 450 billion transactions by the end of the 2026–27 financial year. The target of one billion transactions per day can be achieved within the next five years if UPI can maintain its current pace of penetration and through overcoming the challenges that limit the growth of UPI in future.

UPI growth during the pandemic period

The COVID-19 and associated lockdown paved way for the proliferation of online-based transactions (Donthu & Gustafsson, 2020) rather than offline transactions. The pandemic restricted people from direct contact with community and induced them to adopt digital payments (Allam, 2020). The major share of this opportunity was utilised by UPI payment applications, as it is the most advanced and convenient mode of mobile payment. The pace of growth of UPI in India during the pandemic was very high compared to other modes of digital payments. The main reasons for this rapid growth of UPI in terms of volume and value are ease of use of the UPI apps, cost and time effectiveness, promotional offers, and other rewards offered by various UPI apps due to heavy competition between them.

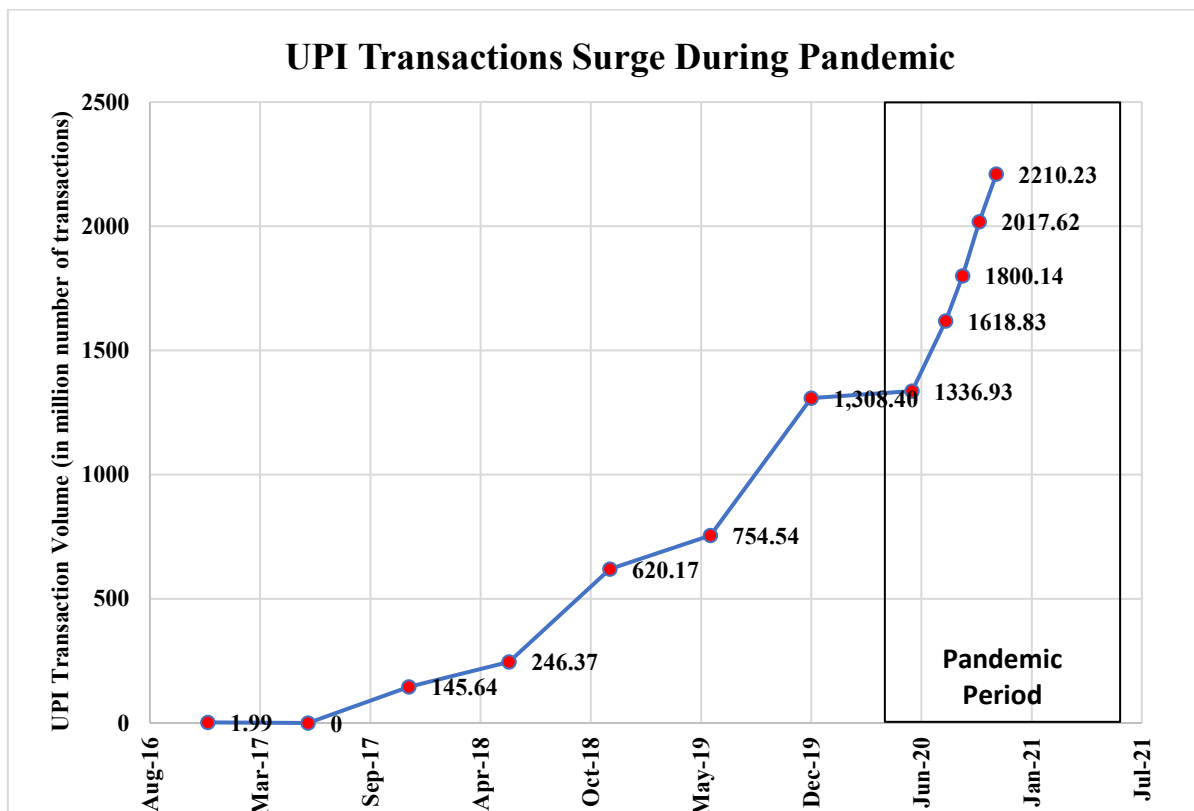


Figure 2. UPI transaction surge during pandemic period. Source: National Payments Corporation of India, *Product Statistics* (2022c)

UPI transactions more than doubled during the pandemic period from one billion in April 2020 to 2.23 billion in December 2020 (Figure 2). During this period, UPI transactions grew

at an average 13.7% monthly. These figures show that the acceptance and adoption of digital payment modes by users rose rapidly during the pandemic period and most users considered UPI as their primary digital payment mode. The pandemic added fuel to the pace of growth of UPI in India. Demonetisation of higher-value currencies also played a significant role along with the pandemic in boosting digital payments in India. But the statistics show that the growth rate of UPI after the pandemic period grew at a higher rate than the pandemic period. This shows that even though the COVID-19 pandemic accelerated the UPI penetration, the impact of the COVID-19 pandemic was limited on the overall penetration of UPI in India.

Discussion

Key strategies to strengthen UPI payments

Identifying the challenges faced by UPI when expanding its user base is important for PSPs when framing various strategies to overcome the challenges, which can be segregated into internal (infrastructural) challenges and external (accessibility) challenges. The PSPs should adopt specific strategies to tackle these internal and external challenges.

Strategies to overcome infrastructural challenges

UPI is facing the challenge of an increased failure rate on transactions initiated by customers. The technical glitches faced by both private and public sector banks in India are affecting the UPI-based payment transactions. There are several reasons that lead to the increased transaction failure due to technical glitches such as sudden increased penetration of UPI transaction volume over a short span of time, zero income generation to the bank as UPI charges no cost for making payments, lack of accountability for the failed transactions and the complexity of the UPI payment architecture (PWC, 2020). These challenges will bring down the pace of UPI penetration in India. So, it is desirable to adopt strategies to tackle these infrastructural challenges:

- **Timely implementation of UDIR:** Implementation of Unified Dispute and Issue Resolution (UDIR) for the purpose of resolving the complaints and redressals of customers regarding payment issues. UDIR is the concept introduced by the RBI in view of increased payment failure complaints received from payment customers. It is an automated single window redressal system specifically designed to resolve customers' UPI payment failure redressals. It was introduced by the RBI in the year 2020, but it lags in its timely implementation. So, the timely and strategic implementation of UDIR is necessary to tackle the infrastructural challenge of customer grievance redressal.
- **The RBI's directions to examine the lapses:** the RBI should periodically review the lapses by the participating banks in resolving the customer grievances related to UPI

transactions. The RBI should also make the participating banks accountable for the payment failures due to technical glitches. This helps the RBI to identify the basic causes for these technical glitches and to fix these glitches permanently.

- Strengthening the guidelines for customer protection measures: the RBI should frame and periodically update the customer protection guidelines regarding payment grievances in line with safeguarding customers' interests. The guidelines should clearly undermine the limit of customers' liabilities in the event of unauthorised transactions or failed transactions. This helps to bring safety and protection to the minds of customers in delivering the UPI transactions and thereby increases the pace of UPI penetration.
- Increasing the transaction limit of UPI: The current UPI daily limit for UPI transactions is Indian Rupee (INR) 100,000 (limit changes with the participating banks) and up to 10 transactions per day. This limits the UPI usage among existing users and thereby compels them to adopt other payment mechanisms to transfer higher amounts than the limit. Through proper customer protection measures, it is advisable to increase the transaction limit of UPI payments to increase the extent of use.

Strategies to overcome accessibility challenges

India faces challenges in rural areas regarding Internet connectivity, digital infrastructure and digital literacy. In such areas it is difficult for a digital payments platform to grow as adequate Internet connectivity and digital education are necessary for building awareness of the UPI apps. PSPs should form appropriate strategies to tackle the accessibility challenges posed by UPI in its penetration:

- Promote Internet user base: The Internet user base of India stands at 43% of the total population ([International Telecommunication Union, 2020](#)) and is expected to reach 900 million users by the year 2025 ([Internet And Mobile Association of India, 2019](#)). The data shows more than half of the population is still out of the purview of Internet use. Since Internet participation by users is necessary for the growth of UPI, there should be proper infrastructural developments in rural areas for penetrating Internet users. The UPI user base can be improved from the existing level by promoting the Internet user base in India. Increased penetration of an Internet user base can help in increasing digital payments and thereby play a large role in helping the users to manage their personal finances and be financially included ([RBI, 2020](#)).
- Promote P2M payments: The peer to merchant (P2M) or person to merchant payments in terms of value of transactions was only 22% of total UPI transaction value ([National Payments Corporation of India, 2022a](#)) during the 2021–22 financial year. But the total volume of transactions of P2M and P2P is almost on par with each other. The statistics show users are reluctant to make high-value payments to the merchants on their

purchases. So, the service providers should encourage the users to make P2M payments through more promotional and add-on benefits when making high-value UPI payments to merchants.

Practical Study Implications

The increased growth and penetration of UPI in India gives the clear indication that it emerged as a game changer in the digital payments industry. UPI had already surpassed all other digital payment modes in terms of volume and value of transactions in just two and a half years of its commencement by NPCI. UPI recorded 45.956 billion transactions worth USD1.014 trillion during the 2021–22 financial year, which is substantially ahead of its competitors such as debit cards, credit cards, PPIs, and IMPS. The polynomial trendline projection on the projected volume of UPI transactions for the next year shows that the India's targeted volume of one billion UPI transactions per day can be achieved by the 2026–27 financial year. This targeted volume can be achieved only if UPI can maintain its current pace of penetration. Only 31.3 % of total payments were in real-time digital mode during the 2021–22 financial year, and this shows that two-thirds of the entire transactions are done through cash payments. Most of the population is still out of the purview of UPI payments. So, there is substantial opportunity for UPI to expand its user base if it can successfully overcome the infrastructural and accessibility challenges. The tech giant Google's recommendation to the US Federal Reserve to draw lessons from India's successful performance of UPI is an example that the world is benchmarking UPI in the mobile payments industry. The exponential innovation, push and pull-based mobile transactions, multiple payment options, simplicity and security distinguish UPI from other payment modes. By implementing the strategies to overcome the challenges such as low penetration of UPI in P2M payments, challenges in Internet connectivity and lack of digital literacy, the UPI can achieve the targeted one billion transactions per day. The Indian economy can curtail its overdependence on currency transactions and thereby achieve the goal of a transparent economy through digital financial inclusion if the UPI can maintain its current pace of growth.

Conclusion

The main objective of the study was to have an in-depth theoretical understanding of UPI and its current pace of growth based on published UPI statistics by NPCI, and potential future penetration based on polynomial trendline projection. The study also discussed possible challenges that limit the future penetration of UPI, and the various strategies to overcome these challenges. The existing literatures concentrated mainly on the various adoption and usage determinants of UPI, and it helped the various PSPs in improving their UPI payment

services. But when it comes to the projections based on the previous performance of UPI, the existing literature is lacking. The existing literature does not discuss the various challenges that limit the UPI growth rate and the various strategies that can be adopted to overcome these challenges.

This paper addresses this gap and introduces new tools for future UPI projection and provides various strategies for government and other PSPs in attaining their targeted one billion UPI transactions per day by the 2026–27 financial year. The polynomial trendline projection anticipates the targeted one billion UPI transactions can be achieved only through maintaining the current pace of growth. The current pace of growth can be maintained only through overcoming the infrastructural and accessibility challenges posed by UPI in India. The study put forward strategies to overcome infrastructural challenges which include timely implementation of UDIR, improvements in the current direction mechanism of the RBI in figuring out the lapses from the participating banks, periodic updating of guidelines for strengthening the customer protection, and increasing the transaction and daily limit of UPI. The study also provided strategies to overcome the accessibility challenges posed by UPI through increasing the Internet user base, especially in rural areas of the country and the need to promote P2M transactions. The adoption of these strategies by government and PSPs can improve the pace of growth of UPI in India and can achieve the targeted one billion UPI transactions by the 2026–27 financial year.

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