

# UNITED PAYMENTS INTERFACE GROWTH TRENDS AND FUTURE PROSPECTS

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**Abstract-** UPI (Unified Payments Interface) has emerged as a technological revolution in the fin-tech industry, changing the way in which people deal with money. This research paper presents a comprehensive review of the UPI ecosystem, aiming to understand its impact on various stakeholders and its broader implications for the economy.

The paper begins by highlighting the history of UPI and its growth over the years. It examines the benefits and challenges faced by consumers, merchants, and financial institutions, shedding light on factors such as transaction costs, convenience, security, and financial inclusion. Next, it places emphasis on the fact that UPI has become more handy for people, and they prefer it to cash. The most important of all is the false perception of people in terms of trade volumes and the value of UPI. Although UPI may have a big share in the number of transactions, its share in terms of value is very small as compared to its volume. The paper places special emphasis on this fact and provides a detailed explanation for it. The trends in UPI depict an upward curve over the past few years and are expected to grow in the coming years.

Finally, the paper discusses the emerging trends and future prospectus for UPI. It examines the evolving landscape of API-based services, including peer-to-peer payments, merchant payments, bill payments, and financial products. Overall, this research paper contributes to our understanding of the transformative impact of UPI on financial inclusion and digital payment adoption. The findings provide valuable insights for policymakers, financial institutions, and other stakeholders in designing strategies to leverage UPI's potential and address the existing challenges to ensure inclusive and secure digital financial ecosystems.

**Keywords -** Fin-tech, United Payments Interface , peer-to-peer , payments

## 1. INTRODUCTION

As the world progressed, India noticed a desire to combine a payment system that could aid in its rapid growth. With the objective of integrating the bill machine and introducing a new complete fee, the National Payments Corporation of India was formed in April 2009 . Although previous to the creation of UPI , numerous systems for switch of funds like NEFT, RTGS and so forth existed within the subcontinent yet they had been no longer easily reachable by everyone and were not as complete due to their complexities . In addition , The urge to grow particularly on this zone arose in March 2011 whilst in a survey of Reserve Bank of India , it turned into visible that much less than 10 individuals make non-coins transactions each 12 months. For the accomplishment of this cause RBI in 2012 , released a vision statement for a period of 4 years with the purpose of developing a comprehensive and integrate bills device for both traders and clients. NPCI became granted the number one function of growing reduce machine under the regulation of RBI. On April eleven , 2016 , NPCI at the side of Dr Raghuram G. Rajan , Governor of RBI , sooner or later unveiled its new bills device with 21 member banks. Fast forward to May 2023 , 447 banks (2000% increase) [1] are connected with UPI and provide related offerings .The quantity of transactions have also visible a growing trend with round 9,415.19 [1] Million transactions in May , 2023. In phrases of Value it stood at 14,89,145.50 [1] Crores. UPI offers a comprehensive way to carry out transactions because it allows each 'peer to see' and 'peer to merchant' transactions that can be scheduled as paid as consistent with the request. UPI permits customers to hyperlink a couple of financial institution accounts to a single cellular application, getting rid of the need to bear in mind special account details or carry bodily coins. UPI uses a Virtual Payment address (VPA) , through which users can ship and get hold of cash with out revealing their information. Thus the great adoption of UPI has revolutionized the virtual charge panorama in India, selling economic inclusion and reducing reliance on cash transactions. It has empowered people and businesses alike to include the ease and efficiency of cell payments, making UPI a cornerstone of India's digital economy

## 2. OBJECTIVES OF THE PAPER :

The primary goal of this research is to analyze the growth trends in UPI and the reasons for growth, and on the basis of the patterns, credit the future trends along with their applications in different sectors of the economy. In addition, it also gives an overview of UPI, how it works, and its advantages, along with its current applications. In this context, the paper will be primarily focused on:

- Architecture of UPI along with its working
- To analyze the current position of UPI in the Digital Payments ecosystem
- To analyze the current growth patterns in terms of volume and value of UPI
- To give a plausible explanation of the disparity in terms of volume and Value of UPI
- To predict the possible categories of users of UPI
- To discuss the fin-tech industry and UPI
- To Suggest an application of AI in the Digital Payments Ecosystem

- SWOT Analysis
- To predict the future trends of UPI (Value and Volume)

### 3. RESEARCH METHODOLOGY :

The paper uses both primary and secondary data to support the theories and other information and premises mentioned. Information is collected mainly from The official statistics were published by the NPCI AND RBI. It basically focuses on an explanatory method and analyzes various trends to give plausible explanations. Based upon the analyses, assumptions, and other important factors, future conditions and growth rates are predicted.

In addition, certain future applications of AI have also been suggested with reference to current launches within UPI

### 4. PAYMENT INFRASTRUCTURE: UPI

**1. National Payments Corporation of India (NPCI) :** NPCI is the owner , network operator, service provider, and coordinator of the UPI Network. It has the rights to maintain and control the framework of UPI and provide services through third party operators.

**2. Banks :** Banks and payment banks with an RBI-approved mobile banking license and IMPS capability are eligible for UPI. Banks or PPIs should broadly perform the functions/roles mentioned below:

**2.1 Payer PSP :** Member bank as a Payer PSP can onboard a customer into a UPI app, allowing the customer to register for UPI services and provide options to approve a financial transaction or non-financial request wherever necessary.

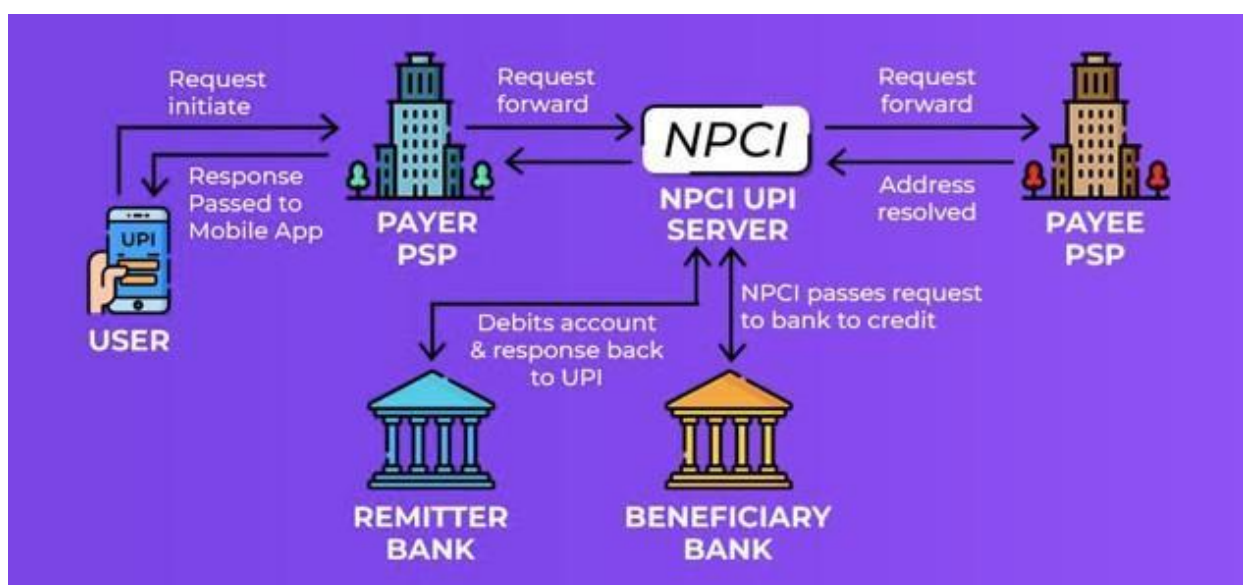
**2.2 Payee PSP :** It refers to the entity that enables merchants or service providers to receive payments from customers using the UPI infrastructure. The Payee PSP plays a crucial role in facilitating seamless and secure transactions between the payer (customer) and the payee (merchant/service provider). A payee PSP is also known as beneficiary/ resolving PSP

**2.3 Remitter Bank :** All the customers engaged in transactions through UPI must have a bank account which will be subsequently debited at the time of payment. The bank also has the responsibility to look if the transactions are carried on ethically and authenticate the PIN set by the customer.

**2.4 Beneficiary Bank :** All the customers must have a beneficiary bank account which will be subsequently credited at the time of payment by any other person . The bank that receives the funds acts as a beneficiary bank.

**2.5 Merchants :** Within the UPI (Unified Payments Interface) infrastructure, merchants play a crucial role as the recipients of payments. They leverage the UPI system to receive funds from customers or payers.

**2.6 Corporates :** In the UPI (Unified Payments Interface) infrastructure, corporates, also known as businesses or enterprises, can utilise the UPI system for various financial transactions. While UPI is primarily used for person-to-person (P2P) and person-to-merchant (P2M) transactions, corporates can leverage UPI to connect with banks and provide services to end consumers .The can also leverage it for business purposes like cash management , reconciliation and reporting etc.



## 5. TYPES OF TRANSACTIONS FACILITATED VIA UPI

UPI supports a number of transaction ranging from financial transactions to non - financial transactions . Here is brief overview of the same :

**5.1 Financial Transactions :** Financial transaction are further classified into 2 types :

**5.1.1 Pay Request :** When using Unified Payments Interface (UPI) in India, the pay request feature allows you to push funds to other UPI users. The payment address may consist of a mobile number and a Money Mobile Identifier Number (MMID - a seven digit number ) , an account number with IFSC , or a virtual ID .

**5.1.2 Collect Request :** UPI provides you with the feature of pulling funds from a remitter / customer using a Virtual ID (VPA).

**5.2 Non - Financial Transactions :** UPI support the following non financial transactions on any Payment service Provider App.

- Check Balance
- Generate QR Code
- Set Transaction Limits
- Set PIN
- Mandate Setup for UPI

## 6. TERMINOLOGY FOR UPI

**6.1 Virtual Payment Address :** VPA stands for "Virtual Payment Address" . It is a unique identifier used within the Unified Payments Interface (UPI) system in India. A VPA is a user-described identifier that is related to a particular financial institution account, allowing users to ship and receive price ranges through UPI. A VPA usually takes the form of an electronic mail address-like layout, such as example@upi. Users can create their VPAs by selecting a unique identifier, generally associated with their name or possibilities, and linking it to their bank account. VPAs offer a consumer-friendly and easy-to-remember opportunity to share financial institution account details, consisting of the account variety and IFSC code, at some stage in UPI transactions. With a VPA, users can perform transactions by virtually sharing their VPA with the sender or recipient, putting off the need to reveal touchy banking records. VPAs also assist with additional functionalities, which include bank account stability, producing QR codes, and managing transaction limits, making them a handy and stable approach for UPI transactions. Some of the 3rd Party Apps in India accredited with the aid of the NPCI, along with their code names, are indexed beneath:

SR Number	TPAP	PSP Banks	Handle Name
1	Amazon Pay	Axis Bank	@apl
		Yes Bank	@yapl
		RSL Bank	@rapl
2	Bajaj Finserv	Axis Bank	@abfspay
3	Bajaj Markets	Axis Bank	@abfspay
4	Cointab	Federal Bank	@fbl
5	CRED	Axis Bank	@axisb
6	Fave(PineLabs)	IDFC First Bank	@idfcbank
7	Goibibo	ICICI	@icici
8	Google Pay	Axis Bank	@okaxis
		HDFC Bank	@okhdfcbank
		ICICI Bank	@okicici
		State Bank	@oksbi
9	Kiwi	Axis Bank	@goaxb
10	Groww	Yes Bank	@yesg

11	Jupiter Money	Axis Bank	@jupiteraxis
12	Make My Trip	ICICI Bank	@icici
		Indusland Bank	@indus
13	MobiKwik	HDFC Bank	@ikwik
14	Phonepe	Yes Bank	@ybl
		ICICI Bank	@ibl
		Axis Bank	@axl
15	Samsung Pay	Axis Bank	@pingpay
16	Slash	ICICI Bank	@icici
17	Slice	Axis Bank	@sliceaxis
18	SuperPay	Kotak Mahindra Bank	@kmbi
19	TataNue	ICICI Bank	@tapicici
20	Timely	The Cosmos Co-Operative Bank	@timecosmos
21	Tvam	Yes Bank	@yesbank
22	Ultracash	IDFC First Bank	@idfcbank
23	YuvaPay	Yes Bank	@yesbank
24	Zomato	ICICI Bank	@zoicici
25	Whatsapp	ICICI Bank	@waicici , @icici
		Axis Bank	@waaxis
		HDFC Bank	@wahdfc
		SBI	@wasbi

Source : National Payments Corporation of India

**6.2 Quick Response (QR) Codes :** QR codes are a key element of the Unified Payments Interface (UPI) system in India, revolutionizing the way payments are made. With UPI-enabled apps, users can generate QR codes that represent their payment details. These QR codes typically contain the payee's Virtual Payment Address (VPA) or UPI ID. When making a payment, the payer simply scans the QR code using their UPI app, which retrieves the payment details encoded within. After reviewing the details, the payer authorizes the payment, and the funds are transferred from their bank account to the payee's account. QR codes provide a convenient and secure way to initiate UPI transactions, eliminating the need for manual entry of payment details. They have simplified the payment process, making it faster and more accessible for individuals and businesses alike. Based upon their usage, they can be classified into two types:

**1. Static QR Codes :** A static QR code is one that is specially designed for shops and merchants. A unique QR code is provided to every shop that has its VPA linked to it, so whenever a customer makes a payment, the amount is credited subsequently to the linked VPA account.

**2. Dynamic QR Codes :** Dynamic QR codes are the ones that are generated instantly every time a payment has to be made to a merchant. The code so generated contains the bank details and the name of the merchant. Such codes are often generated for a limited time and expire either after the payment is done or after the time is up. These codes are gaining popularity in cases such as home delivery of food items, shopping for groceries and household stuff, etc.

## 7. Applications of UPI

UPI has emerged as the most feasible and easy transaction method in the current scenario (especially after the outbreak of the pandemic). Despite having uses in the banking industry, it provides a sense of relief to customers and merchants through its easy-going and one-tap services. Some of its applications are listed as follows:

**7.1 Business/Merchants :**

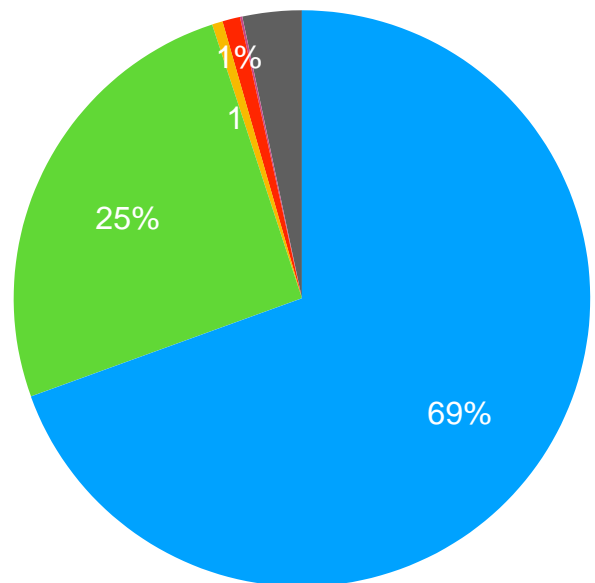
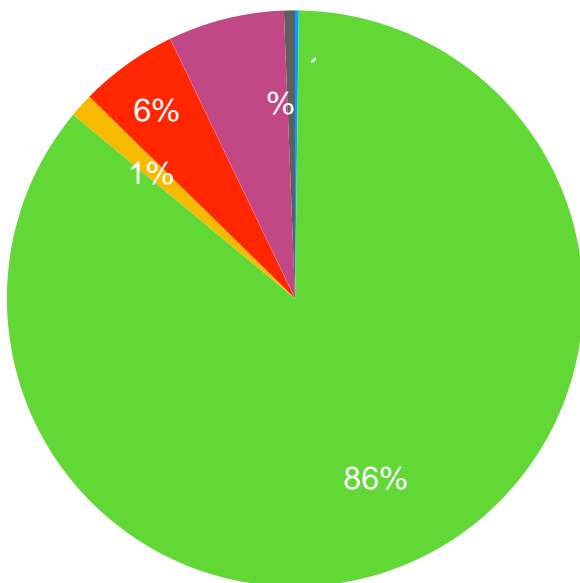
- Online Payments
- In-Store Payments
- Integration with Business Apps
- Subscription Service
- Ability to accept payments from customers not having credit/debit cards
- Seamless Transactions avoiding the problem of exact change

**7.2 Customers :**

- Peer to Peer Payments
- Online Bookings
- Recurring Payments
- No Credential Sharing (VPA is secure)
- 24\*7 Available
- No Location constraints (However a stable internet connection is necessary)
- Single Click Authentication
- No need to carry Cash

**8. Glance at the Trends in Digital Payments (with reference to UPI)**

India’s digital payments ecosystem is comprised of instruments like debit and credit cards, Unstructured Supplementary Service Data (USSD), an AADHAR-enabled payments system, Internet Banking , payment wallets, and, most important of all, UPI. The United Payments Interface has been growing at a remarkable rate since its launch in 2016. As per a RBI report, digital transactions in India have shown a record-breaking compound annual growth rate (CAGR) of 61% in terms of volume and 19% in terms of value [2] from 2014 to 2020. From 0.09 Million transactions in July 2016 to 9,415.19 Million transactions in May 2023, the growth rate has been steadfast and remarkable. As of May 2023, there were 445 banks live on UPI. One of the key drivers of UPI is its motives: simplicity, innovation, Adoption , security, and Cost . According to the Annual Report 2022–23 published by the RBI, 73% of the total digital payments were made using UPI. However, in terms of volume, it stood at only 6.67% [3] (The reason for the same has been discussed later in the paper).



RTGS  
Debit Transfers  
Prepaid Payment Instruments

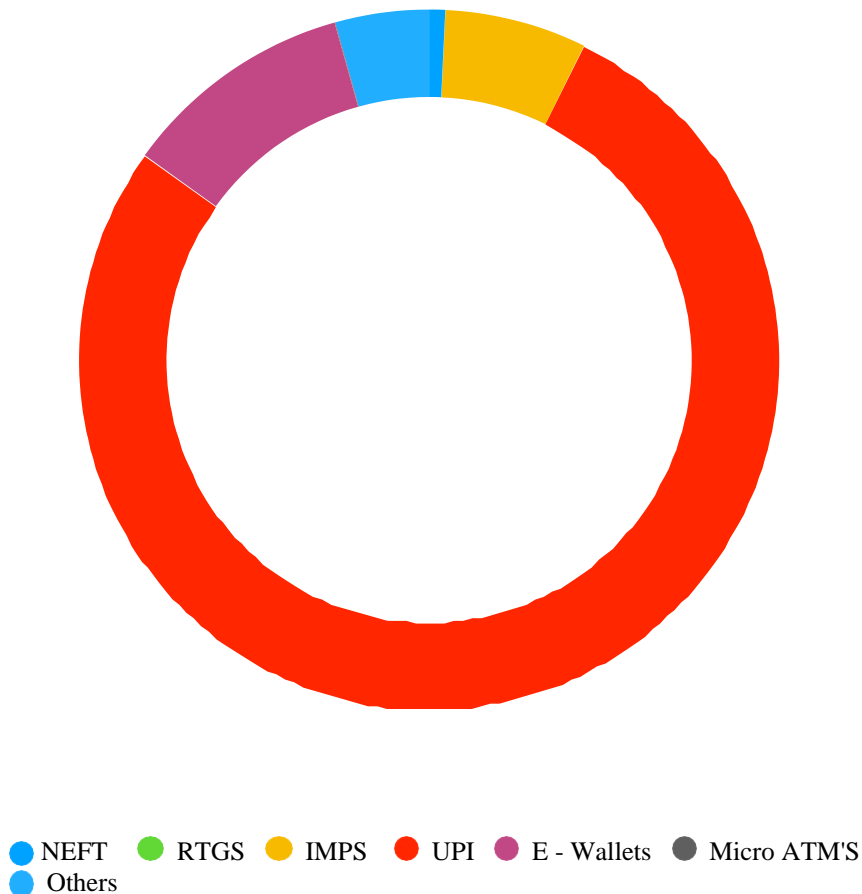


Credit Transfers  
Debit Transfers  
Paper Based Instruments

**HOW INDIA PAYS**

Source : RBI Annual Report 2022-23

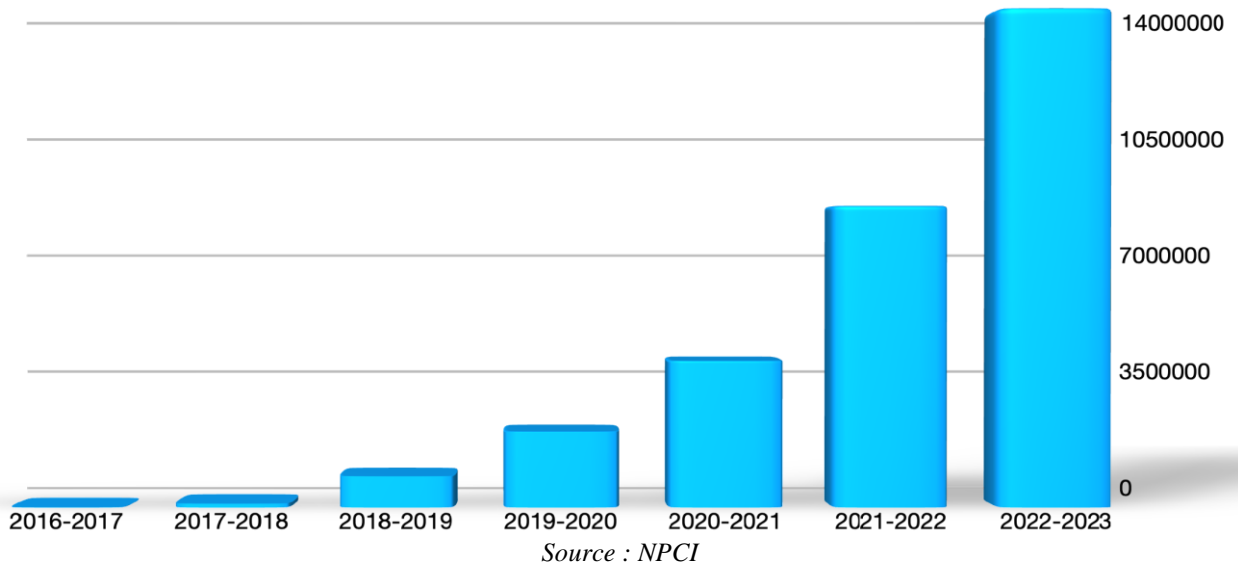
In addition, UPI is not restricted to P2P or P2M transactions within the country. It has a significant share in the remittances (both inwards and outwards) too. In FY 2021–22, the volume of inward and outward remittances by PBs increased by 76.3% and 84.5% [4], respectively, and the value of both inward and outward remittances increased by more than 100% as against a 20% decline recorded the previous year in both volume and value trends. Further, UPI had the highest share in the number of inward and outward remittances, and it also occupied the first place in terms of the value of inward flows. However, in terms of the value of outward remittances, IMPS had the largest share.



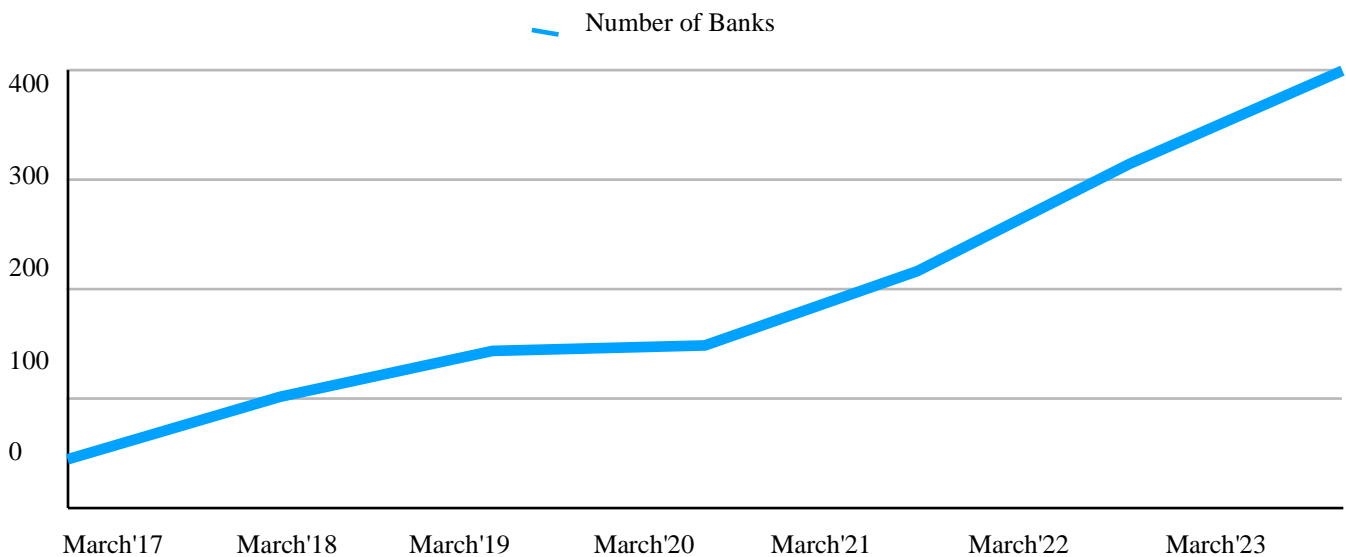
**Number of Remittances (Inward and Outward) FY 2021-22**

Source : Trend of Banking In India 2021-22 - RBI

The possible cause of the sparsity in the volume and value of UPI can be that the common ticket length of UPI P2M transactions changed into INR 687 [5] where the common ticket length of UPI P2P transactions turned into INR 2573 [5]. These ticket sizes are themselves a premise that no matter having the largest proportion in terms of volume of virtual transactions, UPI lacks in terms of extent of volume. Another possible explanation is the limit set with the aid of the NPCI on the quantity of money transferable. According to the contemporary guidelines (as of June 2023), a consumer can send up to INR 1 Lakh to merchants and for P2P transfers in a single day and INR 2 lakh for precise P2M transactions. This forces business establishments and government bodies to choose modes like RTGS and NEFT. Both NEFT and RTGS don't have a maximum limit (except for SBI, which has capped both of them at INR 10 lakh). However, RTGS even has a minimal requirement of INR 2 Lakh. Most Corporate bills are above INR 2 lakh, which pushes them to go for NEFT or RTGS as opposed to UPI. However, for small transactions (Both P2P and P2M), human beings decide on UPI because of its reliability and 24\*7 right of entry to everywhere within India. In addition, the payments are settled straight away and aren't a problem for any agreement duration, as in the case of NEFT and RTGS. Another explanations such disparity can be the categorization of UPI (discussed in the next section). The growing trend of UPI is that its volume is growing year over year and is anticipated to develop at a faster rate in the future. As increasingly more humans become aware of UPI and the authorities provisions for the spread of awareness, along with extra accessibility to the internet and cell phones, UPI is predicted to develop in the future. The chart below depicts the developments in the quantity (volume) of UPI. It may be assumed that such a disparity will become null in the coming years.

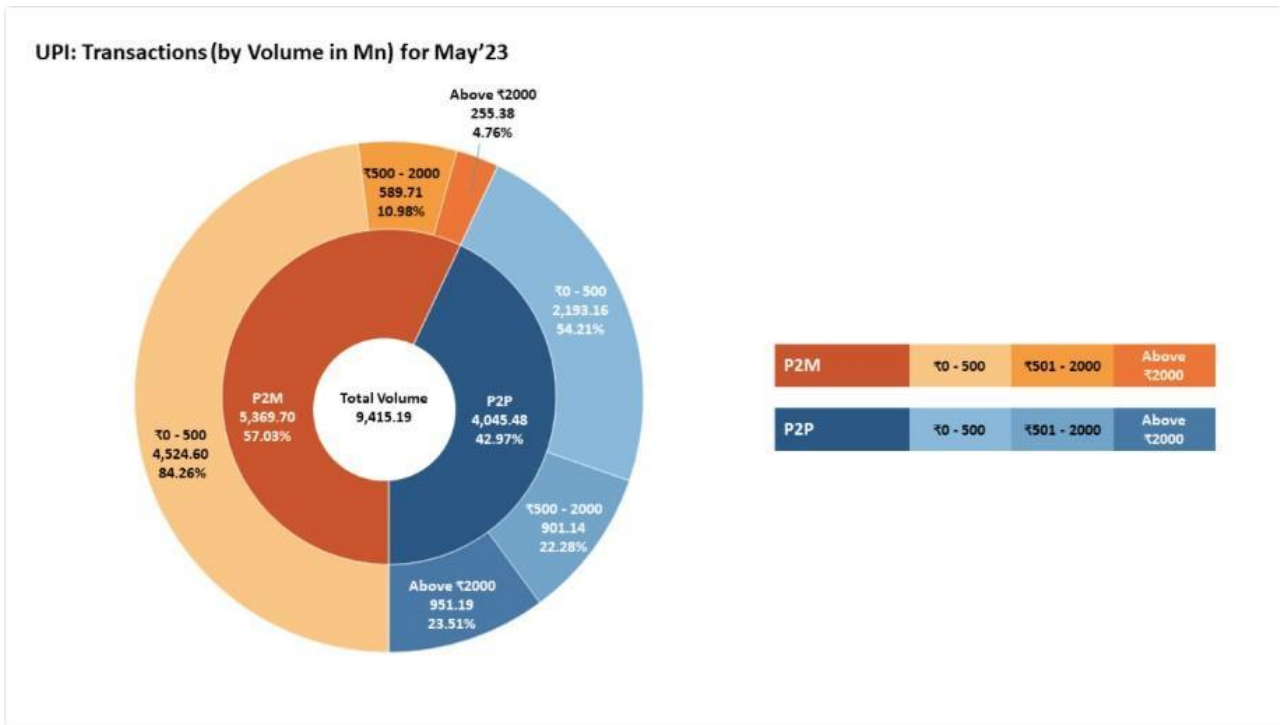


The number of banks that haven been connected with UPI has also seen a magnificent growth in recent years . From 0 banks in April 2016 to 445 Banks in May 2023 , the growth is unbelievable . The chart be- low depicts the growth in the number of banks associated :



### 9. Categorization of UPI Transactions

As per the data published by the National Payments Corporation for India for May 2023, most of the transac- tions made through UPI were P2M (around 57%) [6]. However, the share of P2P transactions is not lacking, with a share of 43%. In P2M transactions, 84.26% of the total transactions were made for small amounts (INR 0-500). However, in the case of P2P payments, it stood at 54%.. Thus, small transactions are dominating UPI. As it is evident from the data below that only 4.75% of the total P2M transactions were above INR 2000, it can be clearly inferred that UPI has a major share in the small payments market. One plausible explanation for the same is the merchant classification for UPI. As per the NPCI, high-transacting categories in the UPI ecosystem include groceries and supermarkets, eating places and restaurants, department stores, bakeries, drugs and phar- macies, etc [7] . As these places usually cater to the general public too and are meant for use by all irrespective of any economic conditions, there is a great possibility that the payments made at these places can fall under the category of small value payments (INR 0-500) or below 2000. The pie chart below shows the number of UPI transactions (Both P2P and P2M) according to their payment amount and their respective shares:

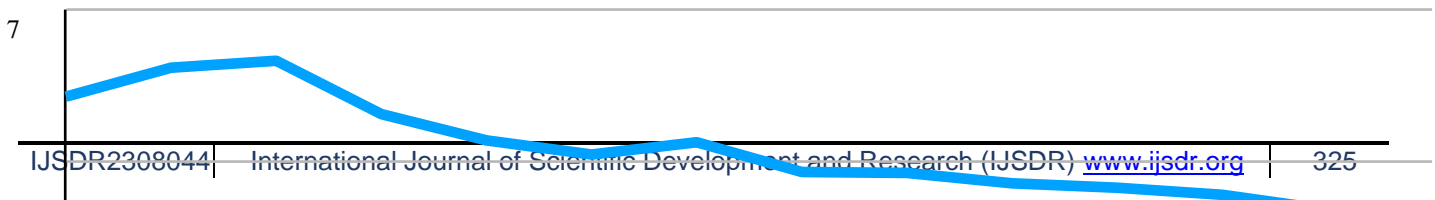


Source : National Payments Corporation of India

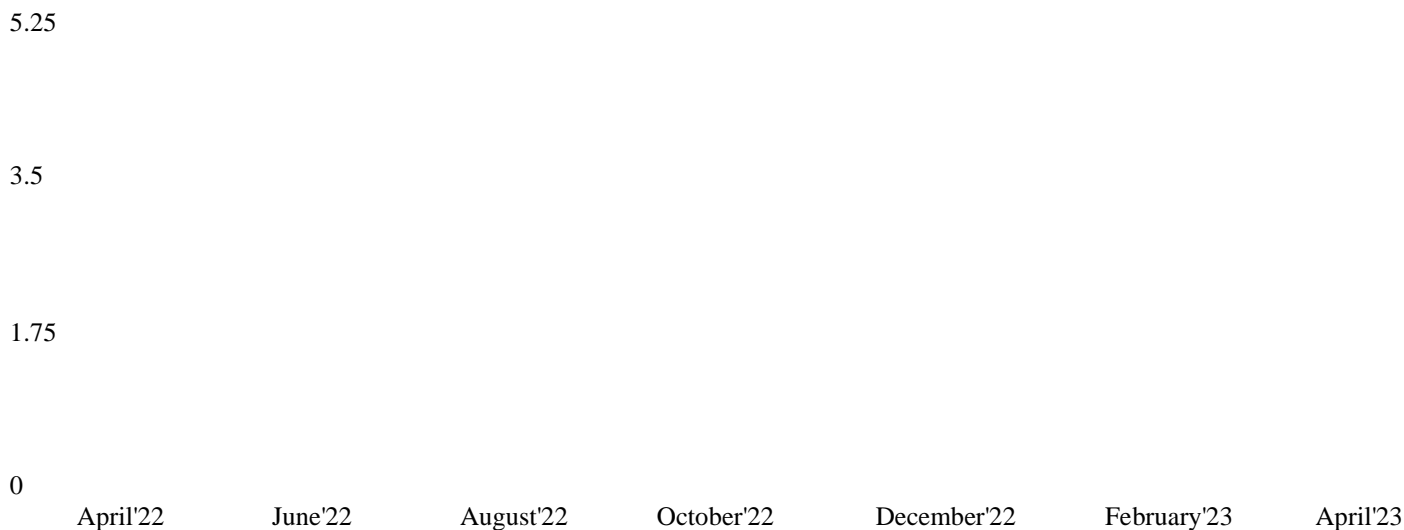
Another plausible explanation can be that recently, in March 2023, the NPCI announced small inter- change fees ranging from 0.5% to 1.1% [8] on UPI merchant transactions using a Prepaid Payments In- strument for values above INR 2000. This is applicable in cases where you recharge your wallet in ad- vance and pay using the amount present in the wallet. Whenever a person makes a payment to a merchant using a PPI wallet, the transaction will be subject to an interchange fee depending on the category of payment it falls under. For example, in the case of payments at a convenience store, the charge is as high as 1.1% and in the case of fuel, it is as low as 0.5%. However, such a fee is to be paid by the merchant to the wal- let or PPI provider and not by the customer. Since such a charge is only applicable on transactions above INR 2000, small merchants and vendors are least likely to be impacted by this charge. The main effect will be on merchants that deal in large transactions (more than INR 2000), given that customers make payments using a PPI wallet like Paytm, PhonePe, Mobikwik, etc.

The main aim behind this move was to make the transactions more convenient for consumers. However, It does not prove to be viable for the merchants. In a technical report by Professor Ashish Das (IIT Bombay), the zero interchange for transactions up to Rs 2,000 is a camouflaged truth. He believes that "As per the NPCI circular, a necessary condition for zero interchange on a prepaid wallet person-to-merchant (P2M) UPI transaction is that the transaction up to Rs2,000 is done at a small offline merchant. A small merchant is one who does a daily business (selling goods and services) of no more than Rs 5,500. Therefore, all online and large offline mer- chants who currently accept normal UPI would now be charged a merchant discount rate (MDR) for accepting a payment of any amount through UPI when the payer uses a prepaid wallet." [9] He further added that "It may be noted that many merchants that accept payments through UPI today belong to this category of online mer- chants and large offline merchants. They would thus get thrust into MDR for all prepaid wallet-based UPI transactions, even below Rs2,000. Even a small vegetable vendor who sells goods worth more than Rs 5,500 per day would have to bear this MDR hit. This would put a cost burden on retail merchants, polluting the well- accepted digital payment space created by UPI" [9] .

However, since this policy was launched in April of this year, much cannot be inferred from this explanation as not enough data is available to support the above premise. So the explanation is based on the presupposition that this will have a negative (% may vary) impact on transactions above INR 2000 using PPI. The graph below shows the percentage of P2M transactions above INR 2000 in terms of volume :

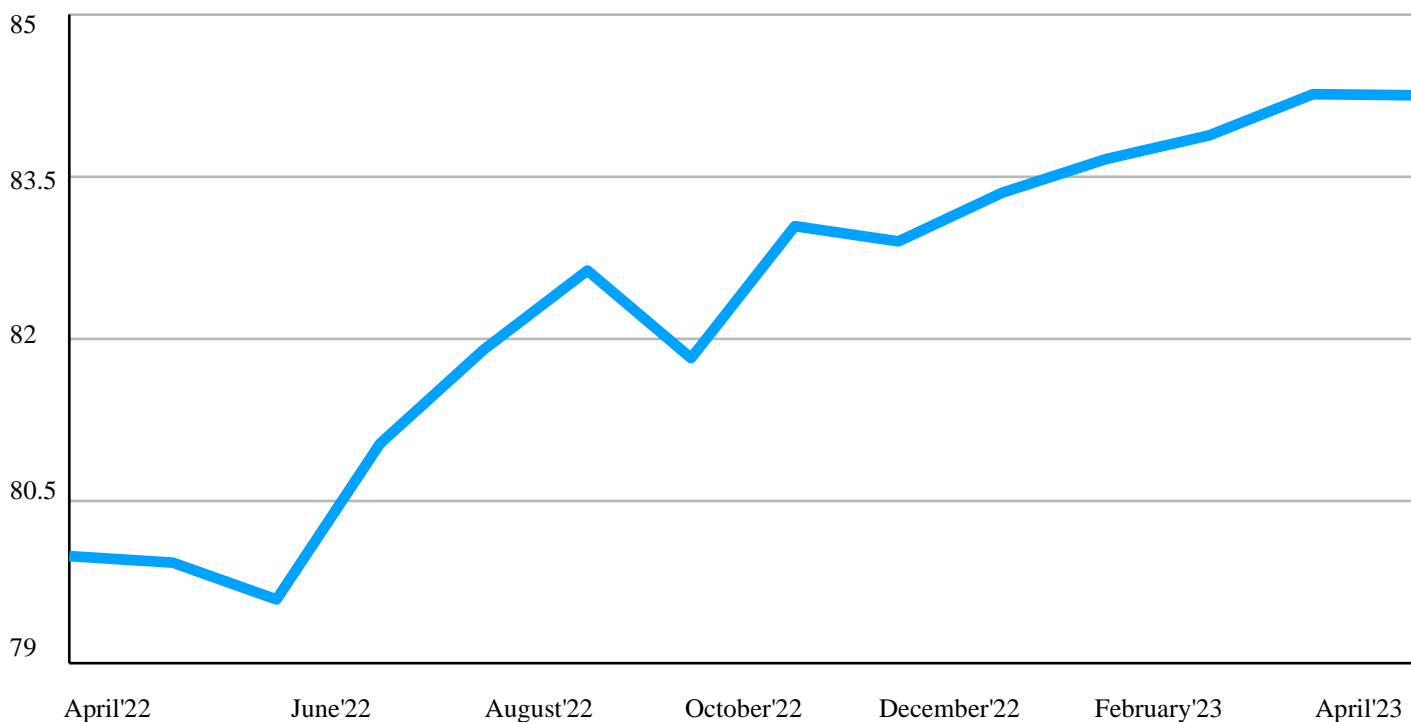






Source : National Payments Corporation of India

On the other hand , the number of P2M transactions in the category of INR 0-500 have shown slightly increasing trends. The chart below supports the above premise (all date is in terms of % of P2M transactions) :

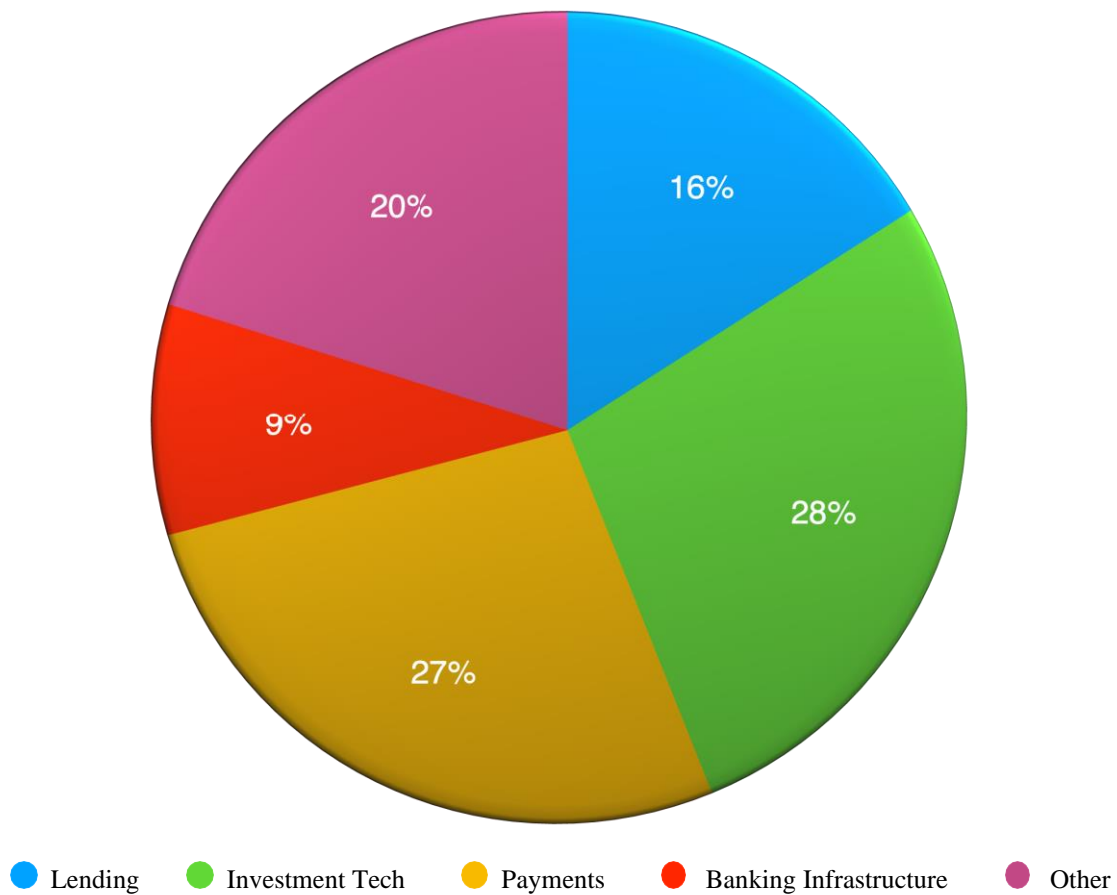


Source : National Payments Corporation of India

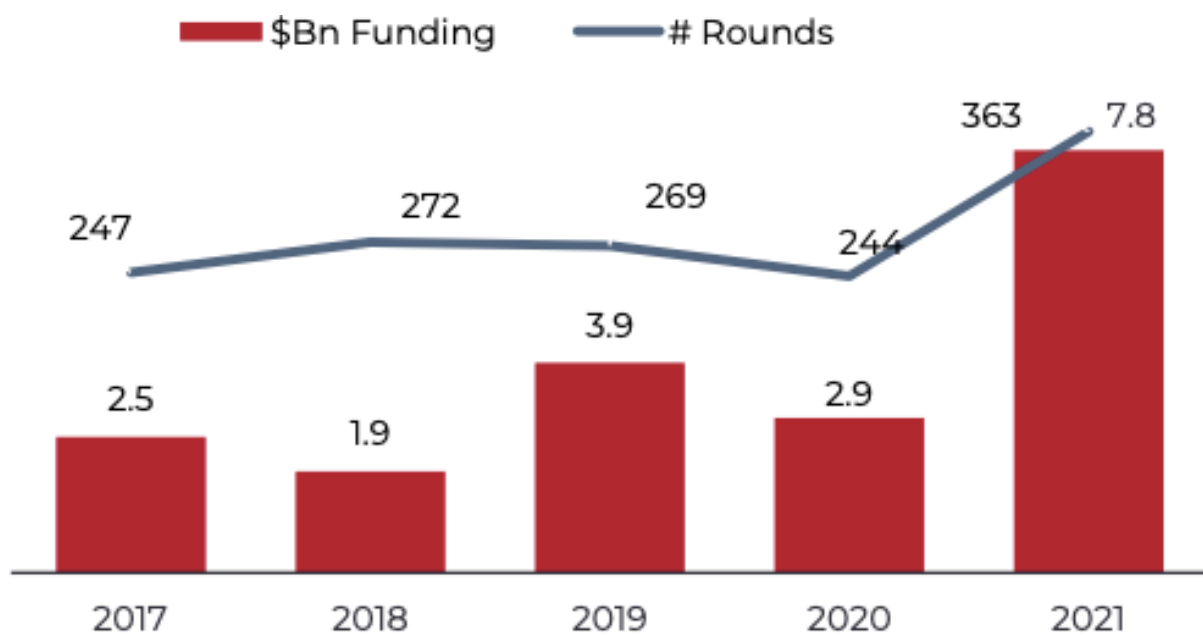
From the above 2 theories and the data supporting them, it can be concluded that UPI transactions in the P2M domain are mainly dominated by short-term transactions, which constitute about 82–83% of the P2M transactions every month. Considering the above conclusion and the growth trends, it is expected that UPI will continue to be dominated by short-amount P2M transactions in the future and will continue to grow in numbers in terms of **volume**. (It must be noted that this conclusion is reached considering the assumption that the interchange fees introduced by NPCI will have a negative impact on P2M merchant transactions above INR 2000.) If this assumption is proved wrong in the future, trends can vary.

### 10. Effect of UPI On the Fin-tech Industry

Financial technology (better known as fin-tech) is used to describe new technologies designed to improve and automate the delivery and use of financial services. At its core, fintech helps companies, business owners, and consumers better manage their financial transactions, processes, and lives. It includes proprietary software and algorithms used on computers and smartphones. The word fin-tech is an abbreviation for "financial technology". Examples of fin-tech applications include robotic advisors, payment applications, peer-to-peer (P2P) lending applications, investment applications, and crypto applications, among others. Since its launch in April 2016, UPI has played a major role in the development of the fintech industry, as digital payments are an integral part of the fin-tech industry. From full 24\*7\*365 mobile access to real-time payments to multi-account integration and an IMPS system security backend, UPI has become the lifeblood of payments and other activities for businesses and consumers. The increasing global adoption of UPI has also facilitated digital payments cooperation between India and other countries such as Singapore, Malaysia, Bhutan, the UAE, Nepal, and France. In an article originally published on BusinessLine, Saurabh Thukral (a senior specialist with Frontier Technologies Vertical) highlights the fact that "Since UPI's launch in 2017, India has been improving financial inclusion at a CAGR of 5%-plus, and since 2018, the country has more than doubled the extent of digitization of payments, as per the extensive Digital Payments Index and Financial Inclusion Index maintained by the RBI." [10] Fast forward to 2023, and the FIN-TECH adoption rate in India increased to 87%, whereas it was 64% globally. This supports the above premise of the effect of UPI on the fintech industry. One recent development was the introduction of UPI 123 PAY. It is a more defective way, as it allows consumers to make payments without even using the internet. It basically offers an instant payment system for feature phone users using missed call-based approaches, proximity-based approaches, and many other technologies. The missed call-based feature allows customers to have control over their bank accounts and make the necessary transactions when required. [11] With the introduction of UPI 123 PAY, the fin-tech industry will get a massive advantage as people without access to internet facilities will also be able to make payments and manage their bank accounts conveniently. The pie chart below (based on 2021 data) depicts the segment-wise distribution in the fin-tech industry:



Talking about the developments in the Fin-tech industry , the growth rates are commendable. The chart below depicts the funding growth in the fin-tech industry



Source : EY Analysis

The contribution of UPI is such a development is noteworthy . Some the points are listed below :

- Introduction of UPI 2.0
  - UPI Autopay
  - UPI Enabled IPO payments
  - Recurring Payments
  - Offline Payments worth INR 200 to be made without an internet connection
- International Expansion of UPI
  - Partnership with PayNow (Singapore)
  - Partnership with LuLu Group International (UAE)
  - Partnership with Merchantrade Asia (Malaysia)
  - Partnership with Royal Monetary Authority (Bhutan)
  - Partnership with Gateway Payment Service & Manam Infotech (Nepal)
- Massive Share in the digital payments segment (volume)
- Online Lending and saving facilities

Hence In future, it is expected that India will be in coherence with global trend as far as the category of Fin-tech is concerned .

## II. SWOT Analysis

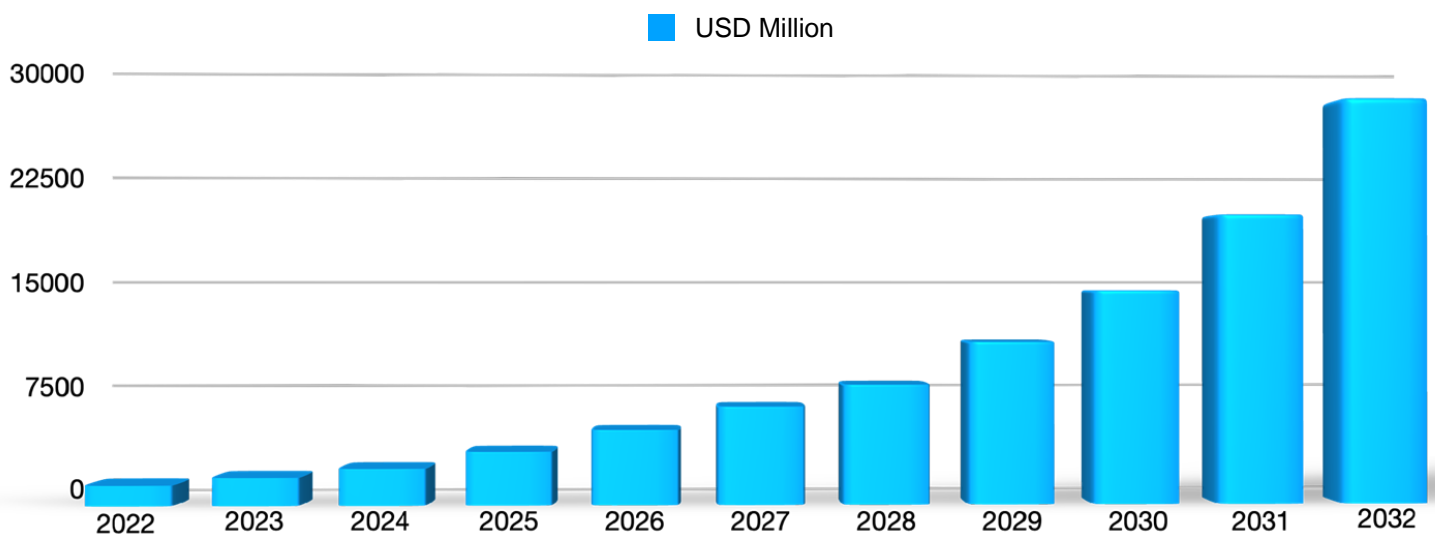
In order to ascertain the efficiency of a certain product, an individual, or an organization, certain analyses are usually conducted. This can include SWOT Analysis , TWOS, Porter's five force model, BCG Matrix , PES- TLE model, etc. However, SWOT analysis is considered to be the best suited for the current situation as it eval- uates the right internal and external potentials and gives us a glance at the pros and cons of both. SWOT analy- sis is basically a strategic planning framework used to ascertain the strengths, weaknesses, threats, and oppor- tunities associated with an organization (or maybe a specific product). In the case of the Unified Payments In- terface, a SWOT analysis is being conducted to learn about possible future opportunities and environments. This is necessary because business environments are dynamic and are influenced by a number of factors, like political, social, economic, etc. In such a dynamic environment, it is necessary to mold our unique offerings in such a manner that they retain their pride and are not affected by these volatile changes. In addition, the oppor- tunities determined can further propose possible diversification within UPI to make it far more accessible and increase its unique offering. Below is the chart depicting a thorough analysis of UPI:

	<b>HELPFUL</b>	<b>HARMFUL</b>
<b>INTERNAL</b>	<p style="text-align: center;"><b>STRENGTHS</b></p> <ul style="list-style-type: none"> <li>• Simplified Payments System</li> <li>• Secured Sensitive Information</li> <li>• Corruption Deterrent</li> <li>• Multiple VPA’s across different PSP’s</li> <li>• Easy accessibility</li> </ul>	<p style="text-align: center;"><b>WEAKNESSES</b></p> <ul style="list-style-type: none"> <li>• Transactional Delays due to glitches</li> <li>• Lack of trust among people</li> <li>• Limit on the value of a transaction</li> <li>• Vulnerable to Cybercrimes</li> <li>• Requires Cooling Period</li> </ul>
<b>EXTERNAL</b>	<p style="text-align: center;"><b>OPPORTUNITIES</b></p> <ul style="list-style-type: none"> <li>• Internet Penetration</li> <li>• Cash-less Economy ( in line with RBI’s visions</li> <li>• Strong Banking Infrastructure</li> <li>• Disruption in the Fin-tech industry</li> <li>• Inclusion of variety of services</li> </ul>	<p style="text-align: center;"><b>THREATS</b></p> <ul style="list-style-type: none"> <li>• Unfavourable Tax Policy</li> <li>• Liable to the introduction of MDR</li> <li>• Improper Grievance redressal</li> <li>• Lack of awareness</li> <li>• Exploitation of Private Sector</li> </ul>

**12. AI in Digital Payments**

Artificial intelligence can play a significant role in the growth of UPI and facilitate the introduction of futuristic methods in the digital payments sector. As the demand for AI is increasing around the world, its judicious application can bring about a revolution in the payments industry and make it more organized than before. There are a number of applications of AI in the payments sector. Fraud DETECTION is one of the most widely discussed. AI is based on the processing of certain algorithms that track behavior and provide results on the basis of their analysis [12]. Using the same algorithms for fraud detection can be helpful. AI algorithms can track the behavior of fraudulent accounts and store it in their database. Whenever a customer is making a payment, AI can check the authenticity and past records of the receiver and inform the customer whether or not to complete the transaction. However, this will require access to customers personal data. Many of the customers may hesitate to extend their personal data to AI for analysis and won't be able to take advantage of fraud detection. This can be a drawback, but if the authorities build the necessary trust among people, it can be a very beneficial application. Another benefit is the ease of doing KYC. The onboarding process for new partners can be simplified when banks use smart technologies to manage the comprehensive information needed for their know-your-customer (KYC) processes. Using natural language processing, machines can read and understand text and provide results for people to make decisions. They can compare the data with third-party data, such as Temple Building. The result should be an enhanced onboarding experience that benefits both the bank and the client.

Another application of AI can be related to customer satisfaction and benefits. This could be explained using an example. Imagine a situation where you frequently visit a particular place or a particular type of shop in a week or a month using any of your preferred Digital payment apps (Google Pay, PayTm, PhonePe, etc.). After a certain number of transactions, you get a free scratch card (especially in Google Pay) that contains some type of gift voucher or discount coupon. But usually, that discount voucher doesn't apply to our needs and is hence useless for us. In order to solve this problem and increase customer happiness, these apps can use AI algorithms to study and analyze the types of payments the person is making along with their categories. Using the results of the AI algorithms, these app developers can fire up a program that provides the customers with coupons or vouchers that are relevant to their consumption or use case. This will increase customer retention rates due to increased satisfaction. It will also kind of psychologically target people's subconscious minds, and they will make more digital payments at places where they were dealing in cash. This will lead to increased turnover for the PSP company and customer satisfaction at the same time. It must be noted that this is just a judicious suggestion and doesn't exist in reality. However, if implemented, it can be subject to changes. The data on the share of AI in the payments market is not accessible (or not present). However, the market size of Generative AI in Financial markets is given below [13] :



Source (Secondary) : Yahoo Finance

### 13. Future of Digital Payments (with special emphasis on UPI)

Presently, the role of digital payments is expected to grow in our economy owing to factors such as the initiative towards a cashless economy and various other schemes launched by the RBI after COVID. COVID was one such force that promoted the financial inclusion of digital payments in our economy at a much faster rate than expected. Due to the COVID outbreak, everything was shifted online. People who were earlier not aware of such technologies got to know about them in order to adapt themselves to the dynamic environment. This increased the rate of technological literacy to some extent. It resulted in people being inclined more towards digital payments in order to prevent the spread of the virus. This revolution had such a breathtaking effect that people still prefer digital payments over cash even after all things went back to normal. According to a recent Boston Consulting Group Report, India's digital payments market (which includes subsidiaries like retail payments, business-to-business payments by MSMEs, and government payments) is expected to triple from what it is today. In simple terms, it is expected to reach a market size of \$10 Trillion by the end of 2026 [14]. With this increase, there is also expected to be an increase in the number of transactions per day. Currently, UPI logs about 220 million transactions per day. However, according to Dilip Asbe, MD and CEO of NPCI, "UPI is capable of handling a billion transactions per day and is expected to achieve the milestone in the future" [15].

With the expansion of UPI beyond the Indian territory and the penetration of various other services in UPI, it is not hard to believe this claim. Newer technologies, such as blockchain, may pose a threat to UPI. However, such technologies are not fully accepted by governments or citizens. This again gives UPI a major advantage over its competition. According to a report in Business Today, "UPI transactions are expected to account for 90% of the retail transactions in India by 2026–2027" [16]. Retail is a growing market. With its growth, it is expected to drive the growth of UPI too. In the near future, RBI plans to connect UPI cards with UPI, which will further enhance the scope of UPI [17]. In addition to credit card UPI, payments will become more accessible through QR codes without needing a Point of Sale (PoS) machine.

UPI transactions are expected to grow 7x by 2025 [18]. This is further supported by the mentions made by the RBI in its report. RBI wrote, "In India, while UPI-led retail digital payments grew at a compounded annual growth rate (CAGR) of 50 percent and 27 percent in terms of volume and value, respectively (during 2016-17 to 2021-22)". It further mentioned "A decline in the share of low denomination notes, partly due to the substitution of small value payments by the UPI and mobile wallets, corroborated by their narrowing ticket sizes. Lower transactional cash demand was also evident from the sharper decline in the number of cash withdrawals at ATMs than in the withdrawal values, leading to increased withdrawal sizes." [19]. Thus, UPI is expected to dominate the small payments industry in the future.

However, this growth will not be achieved by not taking initiatives. The government needs to take initiatives in order to educate people about internet technology and digital payments and provide them with access to the Internet and such technologies. In addition, financial literacy should be inculcated in the curriculum of educational institutions across the country. People will have to be made aware of the offerings of the government through public speeches, door-to-door services, rural programs, etc.

The charts and graphs shown in the previous section support the claim, as it can be clearly inferred from the upward slope that the growth of UPI is definite in the future (given that no external force hinders its development). Thus, the future of UPI is bright, not only in India but all over the world.

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