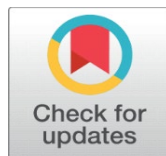


A STUDY ON DIGITAL PAYMENT SYSTEM IN INDIA

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ABSTRACT

Demonetization created huge growth opportunity for digital payment in India and the digital wallet companies garbed the opportunities with both the hands to expand their market share. The Government of India has been taking several measures to promote and encourage digital payments in the country. As part of the Digital India campaign, the government aims to create a digitally empowered economy that is Faceless, Paperless, and Cashless. There are various types and modes of digital payments. Some of these include the use of debit/credit cards, internet banking, mobile wallets, digital payment apps, Unified Payments Interface (UPI) service, Unstructured Supplementary Service Data (USSD), Bank prepaid cards, mobile banking, etc. Digital payment methods are often easy to make, more convenient and provide customers the flexibility to make payments from anywhere and at any time. The future of digital payments in India looks bright with the expected growth in the number of internet users and e-commerce market size.

Keywords: Cashless, Digital Payment, USSD, UPI, PoS, Mobile Wallets, Banking Cards

1. INTRODUCTION

The last decade has seen tremendous growth in use of internet and mobile phone in India. Increasing use of internet, mobile penetration and Government initiative such as Digital India are acting as catalyst which leads to exponential growth in use of digital payment. Electronics Consumer transaction made at point of sale (POS) for services and products either through internet banking or mobile banking using smart phone or card payment are called as digital payment. The consumer perception of digital payment has a significant and positive impact on adoption of digital payment. It has been said that every disruption creates opportunities and one such disruption was the announcement of demonetization by Prime Minister Mr. Narendra Modi on 08 November 2016. Demonetization created huge growth opportunity for digital payment in India and the digital wallet companies garbed the opportunities with both the hands to expand their market share. Demonetization has presented a unique platform for adoption of digital payment, as an alternative to cash for Indian consumers. Adoption of cashless transaction has been significantly pushed by Prime Minister Mr. Narendra Modi as part of government reforms after demonetization of high value currency of Rs. 500 and 1000 (86% of cash circulation). The demonetization resulted in unprecedented growth in digital payment. By February this year, digital wallet companies had shown a growth of 271 % for a total value of US\$2.8 billion (Rs. 191 crores), Indian government and

private sector companies such as Paytm, Freecharge and Mobikwik had been aggressively pushing several digital payment applications, including the Aadhaar Payment app, the UPI app, and the National Payments Corporation of India (NPCI) developed the Bharat Interface for Money (BHIM) app. Digital transfers using apps has brought behavioural change and helped in the adoption of digital payment. This has resulted in ease of transfer of money in rural areas which was not touched earlier by the digital payment method. Now many foreign investors want to invest in digital payment industry which is new attractive destinations because of scope of tremendous expansion in India. There are number of facilitators which are leading to the growth of digital payment and transition from cash economy to less cash economy. These facilitators include penetration of internet connectivity on smart phones, nonbanking financial institution facilitating digital payment, one touch payment, and rise of financial technology sector and push by government either by giving incentives or tax breaks. These all factors are creating positive atmosphere for growth of digital payment in India.

1.2. DIGITAL PAYMENT SYSTEM

The Government of India has been taking several measures to promote and encourage digital payments in the country. As part of the Digital India campaign, the government aims to create a digitally empowered economy that is Faceless, Paperless, and Cashless. There are various types and modes of digital payments. Some of these include the use of debit/credit cards, internet banking, mobile wallets, digital payment apps, Unified Payments Interface (UPI) service, Unstructured Supplementary Service Data (USSD), Bank prepaid cards, mobile banking, etc. Digital payment methods are often easy to make, more convenient and provide customers the flexibility to make payments from anywhere and at any time. These are a good alternative to traditional methods of payment and speedup transaction cycles. Post demonetization, people slowly started embracing digital payments and even small time merchants and shop owners started accepting payments through the digital mode.

What is a Digital Payment?

To put it in simple words, a digital payment occurs when goods or services are purchased through the use of various electronic mediums. There is no use of cash or cheques in this type of payment method.

What is a Cashless Economy?

In a cashless economy, all transactions are carried out using different types of payment methods and this does not involve the physical use of money for the purchase of various goods and services.

1.3. TYPES OF DIGITAL PAYMENT METHODS IN INDIA

- 1) Banking cards
- 2) USSD
- 3) Aadhaar Enabled Payment System (AEPS)
- 4) UPI (Unified Payments Interface)
- 5) Mobile Wallets
- 6) Bank pre-paid cards
- 7) Point of Sale (PoS)
- 8) Internet Banking
- 9) Mobile Banking
- 10) Bharat Interface for Money (BHIM) app

- 1) **Banking cards:** Cards are among the most widely used payment methods and come with various features and benefits such as security of payments, convenience, etc. The main advantage of debit/credit or prepaid banking cards is that they can be used to make other types of digital payments. For example, customers can store card information in digital payment apps or mobile wallets to make a cashless payment. Some of the most reputed and well-known card payment systems are Visa, Rupay and MasterCard, among others. Banking cards can be used for online purchases, in digital payment apps, PoS machines, online transactions, etc.

2) USSD: Another type of digital payment method, *99#, can be used to carry out mobile transactions without downloading any app. These types of payments can also be made with no mobile data facility. This facility is backed by the USSD along with the National Payments Corporation of India (NPCI). The main aim of this type of digital payment service is to create an environment of inclusion among the underserved sections of society and integrate them into mainstream banking. This service can be used to initiate fund transfers, get a look at bank statements and make balance queries. Another advantage of this type of payment system is that it is also available in Hindi Kannada etc. How to Use *99# :

- This service can be used by dialling *99#, after which the customer can interact with an interactive voice menu through their mobile screen.
- To use the service the mobile number of the customer should be the same as the one linked to the bank account
- The next step is to register for USSD, MMID (Mobile Number Identifier) and MPIN

3) Aadhaar Enabled Payment System (AEPS):

Expanded as Aadhaar Enabled Payment System, AEPS, can be used for all banking transactions such as balance enquiry, cash withdrawal, cash deposit, payment transactions, Aadhaar to Aadhaar fund transfers, etc. All transactions are carried out through a banking correspondent based on Aadhaar verification. There is no need to physically visit a branch, provide debit or credit cards, or even make a signature on a document. This service can only be availed if your Aadhaar number is registered with the bank where you hold an account. This is another initiative taken by the NPCI to promote digital payments in the country.

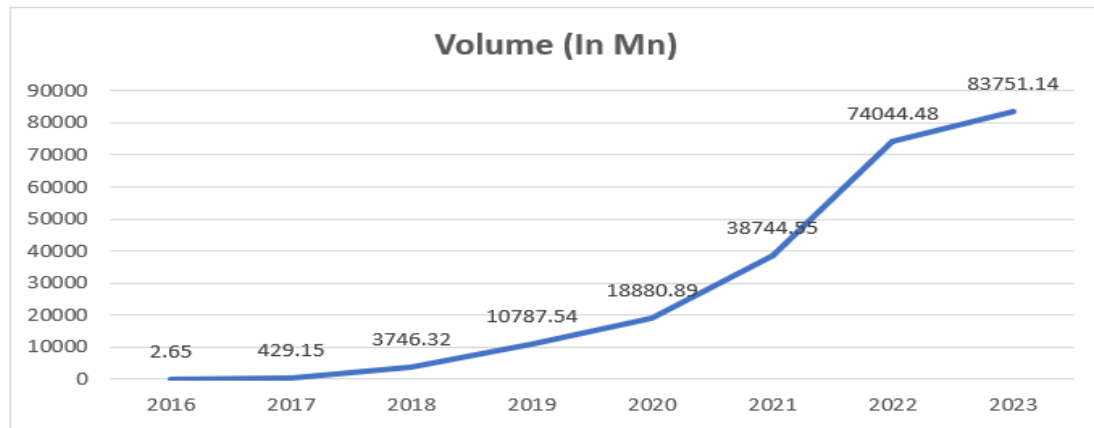
How to use AEPS: It is very simple to use AEPs, all you need to do is to provide the accurate Aadhaar number and the payment will be successfully made to the concerned merchant

4) UPI (Unified Payments Interface) : UPI is a type of interoperable payment system through which any customer holding any bank account can send and receive money through a UPI based app. The service allows a user to link more than one bank account on a UPI app on their Smartphone to seamlessly initiate fund transfers and make collect requests on a 24/7 basis and on all 365 days a year. The main advantage of UPI is that it enables users to transfer money without a bank account or IFSC code. All you need is a Virtual Payment Address (VPA). There are many UPI apps in the market and it is available on both Android and iOS platforms. To use the service one should have a valid bank account and a registered mobile number, which is linked to the same bank account. There are no transaction charges for using UPI. Through this, a customer can send and receive money and make balance enquiries.

How to use UPI

- Download the app on Android or iOS platform
- Register for the service by providing bank account details
- Create a VPA, get an MPIN

UPI has seen significant growth in India since its launch in 2016 by National Payments Corporation of India (NPCI). Here are some highlights of the UPI journey in India with YoY (Year-on-Year) growth statistics till Jan 2023:



- In 2017, UPI recorded a YoY growth of 900%, processing over 100 million transactions worth INR 67 billion.
- In 2018, the YoY growth was 246% with transactions worth over INR 1.5 trillion processed.
- In 2019, the YoY growth was 67% with transactions worth over INR 2.9 trillion processed.
- In 2020, UPI recorded an YoY growth of 63% with transactions worth over INR 4.3 trillion processed in December 2020.
- In 2021, the YoY growth was 72% with over 1.49 billion transactions worth INR 5.6 trillion processed in June 2021[5].
- At the end of the calendar year 2022, UPI's total transaction value stood at INR 125.95 trillion, up 1.75 X year-on-year (YoY), as per the NPCI. Interestingly, the total UPI transaction value accounted for nearly 86% of India's GDP in FY22[8].
- At the end of the calendar year 2023, UPI's total transaction volume stands on 83.75 Billion.

These statistics showcase the increasing popularity and adoption of UPI as a convenient and secure platform for digital transactions in India.

5) Mobile Wallets: A mobile wallet is a type of virtual wallet service that can be used by downloading an app. The digital or mobile wallet stores bank account or debit/credit card information or bank account information in an encoded format to allow secure payments. One can also add money to a mobile wallet and use the same to make payments and purchases goods and services. This eliminated the need to use credit/debit cards or remember the CVV or 4-digit pin. Many banks in the country have launched e-wallet services and apart from banks, there are also many private players. Some of the mobile wallet apps in the market are Paytm, Mobikwik, Freecharge, etc. The various services offered by mobile wallets include sending and receiving money, making payments to merchants, online purchases, etc. Some mobile wallets may charge a certain transaction fee for the services offered.

6) Bank pre-paid cards: A prepaid card is a type of payment instrument on to which you load money to make purchases. The type of card may not be linked to the bank account of the customer. However, a debit card issued by the bank is linked with the bank account of the customer.

7) PoS terminals: Traditionally, PoS terminals referred to those that were installed at all stores where purchases were made by customers using credit/debit cards. It is usually a hand held device that reads banking cards. However, with digitization the scope of PoS is expanding and this service is also available on mobile platforms and through internet browsers. There are different types of PoS terminals such as Physical PoS, Mobile PoS and Virtual PoS. Physical PoS terminals are the ones that are kept at shops and stores. On the other hand, mobile PoS terminals work through a tablet or Smartphone. This is advantageous for small time business owners as they do not have to invest in expensive electronic registers. Virtual PoS systems use web-based applications to process payments.

8) Internet Banking: Internet banking refers to the process of carrying out banking transactions online. These may include many services such as transferring funds, opening a new fixed or recurring deposit, closing an account, etc. Internet banking is also referred to as e banking or virtual banking. Internet banking is usually

used to make online fund transfers via NEFT, RTGS or IMPS. Banks offer customers all types of banking services through their website and a customer can log into his/her account by using a username and password. Unlike visiting a physical bank, there are no time restrictions for internet banking services and they can be availed at any time and on all 365 days in a year. There is a wide scope for internet banking services.

- 9) **Mobile Banking:** Mobile banking is referred to the process of carrying out financial transactions/banking transactions through a smartphone. The scope of mobile banking is only expanding with the introduction of many mobile wallets, digital payment apps and other services like the UPI. Many banks have their own apps and customers can download the same to carry out banking transactions at the click of a button. Mobile banking is a wide term used for the extensive range or umbrella of services that can be availed under this.
- 10) **Bharat Interface for Money (BHIM) app:** The BHIM app allows users to make payments using the UPI application. This also works in collaboration with UPI and transactions can be carried out using a VPA. One can link his/her bank account with the BHIM interface easily. It is also possible to link multiple bank accounts. The BHIM app can be used by anyone who has a mobile number, debit card and a valid bank account. Money can be sent to different bank accounts, virtual addresses or to an Aadhaar number. There are also many banks that have collaborated with the NPCI and BHIM to allow customers to use this interface.

How to Use BHIM App:

- Download and install the BHIM app
- Choose a language
- Register for the service by providing mobile number linked to bank account
- Add bank-related information and set up a UPI PIN by following the given instructions.

1.4. BENEFITS OF DIGITAL PAYMENTS

Faster, easier, more convenient: Perhaps, one of the biggest advantages of cashless payments is that it speeds up the payment process and there is no need to fill in lengthy information. There is no need to stand in a line to withdraw money from an ATM or carry cards in the wallet. Also, with the move to digital, banking services will be available to customers on a 24/7 basis and on all days of a year, including bank holidays. Many services like digital wallets, UPI, etc, work on this basis.

- 1) **Economical and less transaction fee:** There are many payment apps and mobile wallets that do not charge any kind of service fee or processing fee for the service provided. The UPI interface is one such example, where services can be utilized by the customer free of cost. Various digital payments systems are bringing down costs. **Waivers, discounts and cash backs:** There are many rewards and discounts offered to customers using digital payment apps and mobile wallets. There are attractive cash back offers given by many digital payment banks. This comes as boon to customers and also acts a motivational factor to go cashless. **Digital record of transactions:** One of the other benefits of going digital is that all transaction records can be maintained. Customers can track each and every transaction that is made, no matter how small the transaction amount this.
- 2) **One stop solution for paying bills:** Many digital wallets and payment apps have become a convenient platform for paying utility bills. Be it mobile phone bills, internet or electricity bills, all such utility bills can be paid through a single app without any hassle.
- 3) **Helps keep black money under control:** Digital transactions will help the government keep a track of things and it will help eliminate the circulation of black money and counterfeit notes in the long run. Apart from this, this may also give a boost to the economy as the cost of minting currency also goes down. Digital payments are slowly gaining popularity in India and there are many apps that are being launched in this sector. It has become a hassle-free and secure way to make payments.

1.5. DIGITAL PAYMENT INDUSTRY IN INDIA

From being primarily a cash-obsessed economy, India's digital payment story is new but exciting. Driven by progressive regulatory policies and increased use of mobile internet, Indian payment industry is going through a transformational phase. The next few years will witness a whole new way of how money is moved in the Indian economy.

Digital payments started to pick up pace with the growth of e-commerce companies followed by emergence of digital wallet companies. To lure the consumers, the digital wallets doled out lucrative offers and cash backs to get consumers on board using the payment channel. Thanks to the ease of use, attractive offers and increased Smartphone penetration, the digital wallet companies did find their way to the consumer's phone as well as the pocket. To expand their reach, the digital wallets started encouraging customers to use them for offline point of sale (POS) transactions too like at shopping malls, supermarkets, grocery stores, restaurants and gas/petrol stations. These POS transactions are expected to become a majority contributor to the digital payments platform in the coming years. Clearly, digital wallets are playing a unique role in driving the growth of digital payments sector. The other important pillar of the digital payment story are the online ticketing, travel and events companies like IRCTC (Railways), Make my trip, Yatra, Ibibo, Clear trip (Airlines and hotels), Trivago (hotels), red Bus (buses), and Bookmyshow (movie and event ticketing). They have got consumers to transact online.

The digital payment industry is gaining momentum and is projected to grow at an exponential rate. 81 per cent of existing digital payment users prefer the medium over other non-cash payment methods like cheques or demand drafts. Online shopping, payment of utility bills (like electricity, mobile bills, water bills, etc.) and movie tickets are the three things that an Indian user primarily pays for through digital platform.

According to a report by Google and Boston Consulting Group (BCG), the Indian digital payments industry is estimated to touch \$500 billion by 2020, contributing 15 per cent to the country's GDP. An interesting angle to India's digital payment story is that it is going to be dominated by micro transactions (transactions of value lower than Rs 100). In fact, 50% of person-to-merchant transactions are to be under Rs.100, says the GoogleBCG report. Alternate digital payment instruments like digital wallets, UPI, payment banks, Bharat QR are expected to grow fiercely and estimated to double their contribution to 30 per cent in the digital payment industry. Mobile/Digital wallets: The digital payment industry growth will be led by the digital/mobile wallets. According to the Capgemini's World Payment Report, mobile wallets will witness a compound annual growth rate (CAGR) of 148 per cent over the next five years and will be \$4.4 billion by 2022. The digital wallets are also supposed to outshine UPI.

Comparison with global market This exponential growth of the digital payment sector is driven by multiple factors including convenience to pay, the ever growing Smartphone penetration, rise of non-banking payment institutions (payments bank, digital wallets, etc.), progressive regulatory policies and increasing consumer readiness to the digital payment platform. The convenience to pay along with the availability of lucrative offers, are two key factors that have been driving the growth of digital payments in India. This coupled with the increasing Smartphone penetration is proving to be a boon for digital payments sector. India, currently, has third largest internet user base in the world with 300 million users. 50 per cent of these users are connected to internet through mobile only. This 150 million mobile only internet users' are playing a key role in the growth story of digital payments. The advent of next-generation payment systems like payment banks, digital wallets and Bharat QR, is fuelling digital payments furthermore. It is projected that digital payments in India will supersede cash by 2022, according to the IDC Financial Insights report titled The Future of Payments in India: More Spectacular Growth Ahead.

Another key driver of digital payments is positive policy framework changes and government initiatives like launch of new payments systems like - UPI, Aadhar linked electronic payments and improvement of the digital infrastructure. Comparison with global market When it comes to the ecosystem of digital payments, India is pegged to have the most evolved system compared to 25 other countries which were surveyed by FIS, a US-based banking technology company. This included UK, China and Japan. The parameters that FIS used to measure the digital payments in these 25 countries include round-the-clock availability of the services, adoption, and immediacy of payments. FIS Flavors of Fast used the Faster Payments Innovation Index (FPPI) rates different payment system across these 25 countries on a scale of 1-5, with 5 being the highest rating. According to FPPI, India's IMPS service was the only system to get a level 5 rating, leaving behind countries like UK, Singapore, Denmark, Switzerland, China, Japan, and others. This certainly puts India's digital payments story to be an exciting one.

Clearly, the digital payment space is being transformed and the sector has witnessed tremendous growth, innovations and regulatory support over the last two years. Such has been the changes that India has become the most evolved country when it comes to the digital payment ecosystem. The focus should be to keep the momentum going with more support from the government and innovations, safety and convenience from the players.

1.6. TOP 10 MOBILE WALLETS IN INDIA

As shopping patterns continue to evolve, so does the payment platform and payment industry that propels the former. Mobile Point of Sales machines have of course existed for a long time but mobile wallet is a new concept in India that has been surpassing credit card usage and is slowly beginning to replace the traditional payment methods. A mobile wallet, in simple terms, is a virtual mobile-based wallet where one can store cash for making mobile, online or offline payments. There are various types of mobile wallets in India, such as open, semi-open, semi-closed and closed - depending on the type of usage and payments that can be made. Wallets are growing rapidly as they help in increasing the speed of transaction, especially for ecommerce companies and all e commerce marketplaces have integrated with such mobile wallets too. Here are some of the top 10 mobile wallet companies in India and what they offer to their customers.

1) PayTM

PayTM is one of the largest mobile commerce platforms in India, offering its customers a digital wallet to store money and make quick payments. Launched in 2010, PayTM works on a semi-closed model and has a mobile market, where a customer can load money and make payments to merchants who have operational tieups with the company. Apart from making e-commerce transactions, PayTM wallet can also be used to make bill payments, transfer money and avail services from merchants from travel, entertainment and retail industry. Capitalizing on the scope and growth of India's education market segment, they recently partnered with premium educational institutions in India to introduce cashless payments for fees, bills and other expenses. Number of installs: 100 Million (or 10 crores) on Android Play Store.

2) Amazon Pay

Amazon Pay is an online payments processing service that is owned by Amazon. Launched in 2007 globally and in India in 2017, Amazon Pay uses the consumer base of Amazon and focuses on giving users the option to pay with their Amazon accounts on external merchant websites, including apps like BigBazaar etc. You also get to Shop on Amazon using Amazon Pay. Number of installs: Undisclosed

3) Google Pay (formerly known as Tez)

As its part of the Google ecosystem they have scaled up their user base really quickly, in spite of being a late entrant. With Google Pay you can send money to friends, pay bills and buy online, recharge your phone. Since Google Pay works with your existing bank account, which means your money is safe with your bank. There's no need to worry about reloading wallets and you don't need to do additional KYC - which is required for all the other apps. Number of installs: 100,000,000+ (100 Million or 10 crore) on Android Play Store

4) PhonePe (now part of Flipkart)

PhonePe started in 2015 and in just 4 years it has been able to cross the 100 million download mark. From UPI payments to recharges, money transfers to online bill payments, you can do it all on PhonePe. It's got a very good user interface and is one of the safest and fastest online payment experiences in India. Number of installs: 100,000,000+ (100 Million or 10 crore) on Android Play Store

5) Mobikwik

MobiKwik is an independent mobile payment network that supposedly connects 25 million users with 50,000 retailers and more. This mobile wallet lets its users add money using debit, credit card, net banking and even doorstep cash collection service, which can in turn be used to recharge, pay utility bills and shop at marketplaces. Owing to the growing need for convenience, MobiKwik has also recently tied up with large and small time grocery, restaurants and other offline merchants. Another unique feature they have is their expense tracker which allows to set budget for your expenses across all payment instruments and it uses your SMS data to analyse and control spends. Number of installs: 10,000,000+ (10 Million or 1crore) on Android Play Store

6) Yono by SBI

This mobile wallet application was launched by State Bank of India to let users transfer money to other users and bank accounts, pay bills, recharge, book for movies, hotels, shopping as well as travel. This semi-closed prepaid wallet offers its services in 13 languages and is available for non-SBI customers as well. This app also allows its customers to

set reminders for dues, money transfers and view the mini-statement for the transactions carried out. Number of installs: 10,000,000+ (10 Million or 1 crore) on Android Play Store

7) Citi Master Pass

Citi Bank India and MasterCard recently launched 'Citi Master Pass', India's first global digital wallet for faster and secure online shopping. By using this, Citi Bank debit and credit card customers become the first in this country to be able to shop at more than 250,000 e-commerce merchants. It ensures faster checkout with a single click or touch and stores all your credit, debit, prepaid, loyalty cards and shipping details in one place.

8) ICICI Pockets

Pockets by ICICI is a digital bank that offers a mobile wallet for its customers. It provides the convenience of using any bank account in India to fund your mobile wallet and pay for transactions. With Pockets, one can transfer money, recharge and book tickets, send gifts and split expenses with friends. This wallet uses a virtual VISA card that enables its users to transact on any website or mobile application in India and provides exclusive deals or packages from associated brands. Number of installs: 5,000,000+ (5 Million or 0.5 crore) on Android Play Store

9) HDFC PayZapp

PayZapp is a complete payment solution giving you the power to pay in just One Click. PayZapp lets you recharge your mobile, DTH and data card, pay utility bills, compare and book flight tickets, bus and hotels, shop, buy movie tickets, music and groceries, avail great offers at Smart Buy, and send money to anyone in your phone book. Number of installs: 10,000,000+ (10 Million or 1 crore) on Android Play Store. BHIM Axis Pay BHIM Axis Pay is a UPI banking app that lets you transfer money instantly to anyone using just your Smartphone. Make online recharges to your prepaid mobile and DTH set-top boxes directly from the app. Number of installs: 1,000,000+ (1 Million or 0.1 crore) on Android Play Store

1.7. DATA ON DIGITAL PAYMENTS IN INDIA

And here are some interesting findings on digital payment adoption from the recent ACI Survey: While these numbers indicate the growing need for secure, faster and efficient payment methods for online marketplace, efforts to make payments to individual or brick & mortar stores is also increasing. Start-ups and huge corporate are constantly on the lookout for customer-friendly technology, thereby giving more power to the customer.

Digital payments have significantly increased in recent years, as a result of coordinated efforts of the Government with all stakeholders. The total digital payment transactions volume increased from 2,071 crore in FY 2017-18 to 13,462 crore in FY 2022-23 at a CAGR of 45 per cent. During current FY2023-24, digital payments transactions have reached 11,660 crore till Dec.2023. Digital Payment Dashboard has been integrated with Integrated with 118 public sector, private sector, payments, regional rural and foreign banks. In FY 2021-22, 8,840 crores Digital Payment Transactions were achieved with 87.20% Current & Savings Accounts seeded with Aadhaar Number, 81.05% Current & Savings Accounts seeded with Mobile Number

The number of digital payment transactions during the last six years and current year are as below:

Financial Year	Volume (in Crore)
2017-18	2,070.84
2018-19	3,134.36
2019-20	4,571.76
2020-21	5,554.33
2021-22	8,848.29
2022-23	12,008.75

Source: Reserve Bank of India (RBI), National Payments Corporation of India (NPCI) & DIGIDHAN Portal



The Government in coordination with RBI continuously aims to make digital payments user friendly while ensuring payment security. The efforts taken include, *inter alia*, conversational payments in UPI which enables users to engage in a conversation with an AI-powered system to initiate and complete transactions in a safe and secure environment, offline payments in UPI to increase the speed of small value transactions on UPI, expanding the scope and reach of e-RUPI vouchers, Linking RuPay Credit Cards to UPI, and Interoperable Card-less Cash Withdrawal (ICCW) at ATMs.

2. CONCLUSION

The digital payments ecosystem in India has grown significantly in recent years, driven by government initiatives, an increase in internet and smartphone penetration, and the rise of e-commerce. The digital payment ecosystem is supported by private players who offer a range of digital payment services. The future of digital payments in India looks bright with the expected growth in the number of internet users and e-commerce market size.

CONFLICT OF INTERESTS

None.

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None.

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