

## **UPI (Unified Payment Interface) –A new technique of Digital Payment: An Explorative study**

**Dr. Kratika Neema<sup>1</sup>, Dr. Arpit Neema<sup>2</sup>**

<sup>1</sup>*Asst. Prof., Acropolis Institute of Management science & Research, DAVV, Indore,*

<sup>2</sup>*Asst. Prof., Faculty of Computer Application (FCA) Acropolis Institute of Technology & Research, DAVV, Indore,*

### **ABSTRACT**

*Demonetization has presented a distinctive platform for acceptance of digital payment for Indian consumers. Adoption of cashless transaction has been extensively pushed by the government reforms after demonetization. The demonetization consequences give extraordinary growth in digital payment. Digital Payment was come into existence from 1980's i.e. it is not a current emerging technology; the only development is in the different technologies used for conducting the digital payments. This paper reviews the UPI- Unified Payment Interface method of Digital Payment explains its architecture, Technologies, operations, Parties Involved in UPI Transaction, its Benefits & Challenges; also discussed various current UPI Apps available and other digital payment method and their comparison with the UPI transactions. The study conclude that UPI is a tool with compatible features that can make monetary transactions easy and affordable to the customers but it still need confidence & awareness of the customers basically form the rural background.*

**Keywords:** UPI, Digital Payment, Demonetization

### **INTRODUCTION**

India is rapidly moves towards the direction of Digitization. After the proclamation of Demonetization by PM Mr. Narender Modi on 08 November 2016 it created a massive expansion of opportunity for digital payment in India. Thus, the digital Payment companies take hold of the chance with both the hands to spread out their market share. Demonetization has presented a distinctive platform for acceptance of digital payment, as a substitute to cash for Indian consumers.

Adoption of cashless transaction has been extensively pushed by Prime Minister Mr. Narendra Modi as part of government reforms after demonetization. The demonetization consequences give extraordinary growth in digital payment. By a report generated by IAMAI Media, increase in digital payment services in 2018 had shown a growth of 115 US dollars.

There are number of Service providers which are leading to the growth of digital payment and conversion from cash economy to cashless economy. These providers comprises of internet connectivity on smart phones, non-banking financial institution facilitating digital payment, one touch payment, rise of financial technology sector and push by government either by giving incentives or tax breaks. These all factors are generating positive atmosphere for development of digital payment in India.

### **Conceptual Framework:**

#### **• History-**

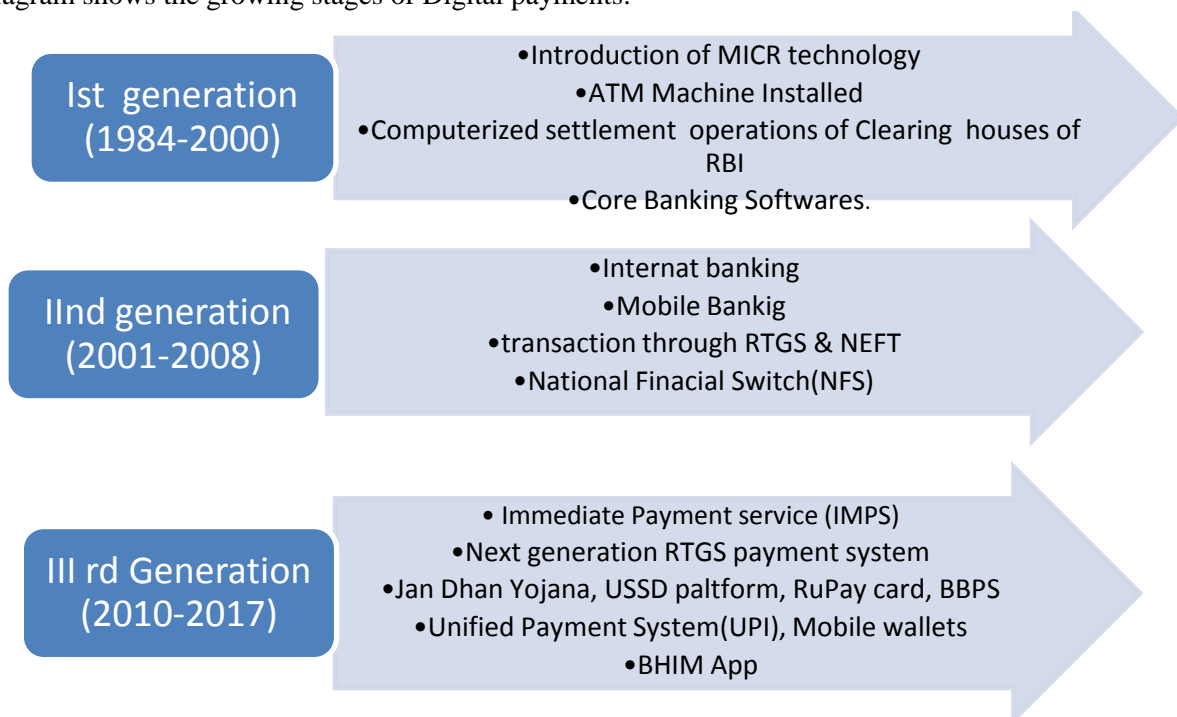
Over a decade India growing fast in the usage of Digital Payments options. With the increase in Internet usage, Digital payment is also come into existence. The payment firstly shifted from the traditional payment into Electronic Payment through Debit and Credit cards, E- Payments options through E-Banking and then further shifted to Mobile Payment through the usage of M –Payment technologies.

Digital payment is also coming in growing stage by the support of Government. After demonetization Indian Government work on Cashless Transaction Through their Campaign known as “Digital India-Power to Empower”.

The Expansion of Cashless India or Digital India is majorly based on four factors:

- **Cash being expensive:** Though there are several perceived benefits of transacting in cash (such as instantaneous settlement, relative anonymity, and the notion of security associated with holding physical value), there are several latent and implicit costs associated with cash.
- **Advancement in technology:** Technology has been advancing at a rapid pace to deliver robust, secure and convenient payments solutions. This enables rapid delivery of payment services to large sections of the population.
- **Economical:** Digital payments allow form services to be delivered at lower costs, afford greater scalability and greater ease of access. This in turn, helps in fostering economic growth and financial inclusion.
- **Government initiatives:** Initiatives taken by the government have created a catalytic environment for the greater proliferation and growth of digital payments.

Digital Payment was come into existence from 1980’s i.e. it is not a current emerging technology; the only development is in the different technologies used for conducting the digital payments. The following diagram shows the growing stages of Digital payments:-



**Figure 1: Generation of E- Payment**

### **Different Digital payment style in India**

#### ***Prepaid credit cards***

- Pre-loaded to individual’s bank account. It is similar to a gift card; customers can make purchases using funds available on the card – and not on borrowed credit from the bank.
- Can be recharged like a mobile phone recharge, up to a prescribed limit.

### **Debit/RuPay cards**

- These are linked to an individual's bank account.
- Can be used at shops, ATMs, online wallets, micro-ATMs, and for e-commerce purchases.
- Debit cards have overtaken credit cards in India. In December 2015, there were more than 630 million debit cards as compared to 22.75 million credit cards.

### **AEPS**

- The Aadhar card Enabled Payment system uses the 12 digit unique Aadhar Identification Number to allow bank-to-bank transactions at PoS.
- AEPS services include balance enquiry, cash withdrawal, cash deposit, and Aadhaar to Aadhaar fund transfers.

### **Online or mobile wallets**

- Online wallets are used via the internet and through Smartphone applications.
- Money can be stored on the app via recharge by debit or credit cards or net banking.
- Consumer wallet limit is US\$ 311 (Rs 20,000) per month or US\$1,554 (Rs 100,000) per month after KYC. The merchant wallet limit is US\$777 (Rs 50,000) per month after self-declaration and US\$1,554 (Rs 100,000) after KYC verification.
- Facilitates P2P fund transfers.

### **USSD**

- Stands for Unstructured Supplementary Service Data based mobile banking.
- Linked to merchant's bank account and used via mobile phone on GSM network for payments up to US\$77.68 (Rs 5,000) per day per customer.

### **UPI**

- The United Payments Interface (UPI) predicted to be a system that powers multiple bank accounts onto a single mobile application platform (of any participating bank).
- Merges multiple banking features, ensures seamless fund routing, and merchant payments.
- Facilitates P2P fund transfers.

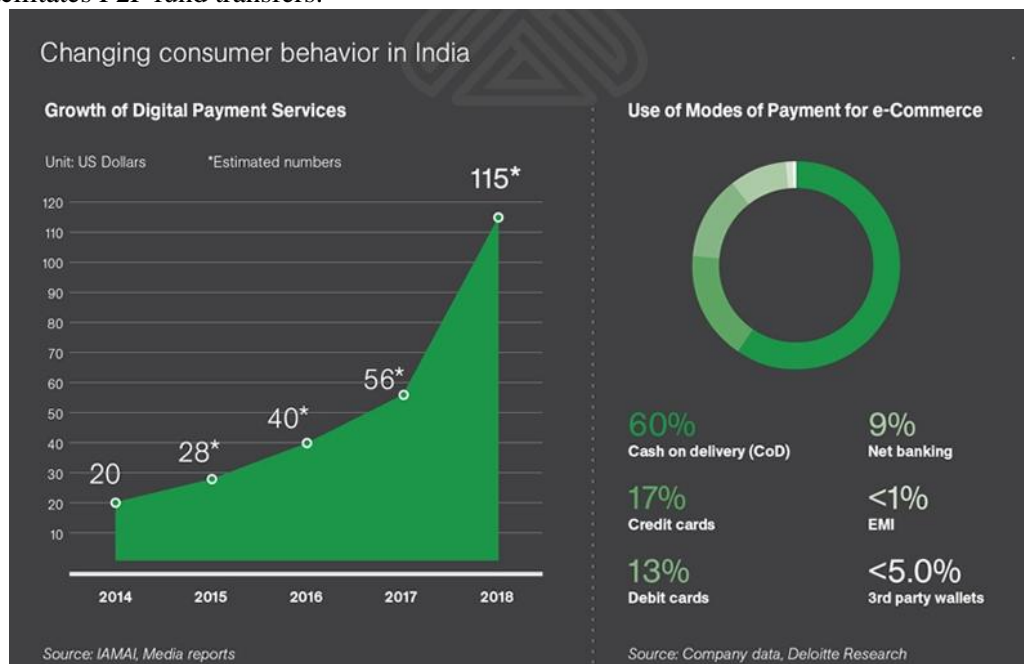


Figure 2: Source: <https://www.india-briefing.com/news/growth-of-digital-payments-systems-in-india-14797.html/>

**Introduction of UPI (Unified payment Interface):**

Unified Payments Interface (UPI) is a digital payment system through which a user can both send and receive money through a Virtual Payment Address (VPA). The money will be directly debited from the customer's bank account. It is a system that powers multiple bank accounts into a single mobile application (of any participating bank), merging several banking features, seamless fund routing & merchant payments into one hood. It also caters to the “Peer to Peer” collect request which can be scheduled and paid as per requirement and convenience.

National Payments Corporation of India (NPCI), the umbrella organization for all retail payment systems in India has taken up a new initiative of implementing “Unified Payment Interface” to simplify and provide a single interface across all systems. Banks have started to upload their UPI enabled Apps on Google Play store from 25th August, 2016 onwards.

**Uniqueness of UPI than other digital payment methods:**

- Immediate money transfer through mobile device round the clock 24\*7 and 365 days.
- Single mobile application for accessing different bank accounts.
- Single Click 2 Factor Authentication – Aligned with the Regulatory guidelines, yet provides for a very strong feature of seamless single click payment.
- Virtual address of the customer for Pull & Push provides for incremental security with the customer not required to enter the details such as Card no, Account number; IFSC etc.
- Bill Sharing with friends.
- Best answer to Cash on Delivery hassle, running to an ATM or rendering exact amount.
- Merchant Payment with Single Application or In-App Payments.
- Utility Bill Payments, Over the Counter Payments, Barcode (Scan and Pay) based payments.
- Donations, Collections, Disbursements Scalable.
- Raising Complaint from Mobile App directly.

**Players involved in UPI**

- Customer PSP (Payment system Player)
- Payee PSP
- Remitter Bank
- Beneficiary Bank
- NPCI
- Bank Account holders
- Merchants

**Advantages of UPI –**

*Benefits for banks:*

- Single click Two Factor authentication
- Universal Application for transaction
- Leveraging existing infrastructure
- Safer, Secured and Innovative
- Payment basis Single/ Unique Identifier
- Enable seamless merchant transactions

*Benefits for end Customers:*

- Round the clock availability
- Single Application for accessing different bank accounts
- Use of Virtual ID is more secure, no credential sharing

- Single click authentication
- Raise Complaint from Mobile App directly

**Benefits for Merchants:**

- Seamless fund collection from customers - single identifiers
- No risk of storing customer’s virtual address like in Cards
- Tap customers not having credit/debit cards
- Suitable for e-Com & m-Com transaction
- Resolves the COD collection problem
- Single click 2FA facility to the customer - seamless Pull
- In-App Payments (IAP)

**Technical Architecture of UPI:**

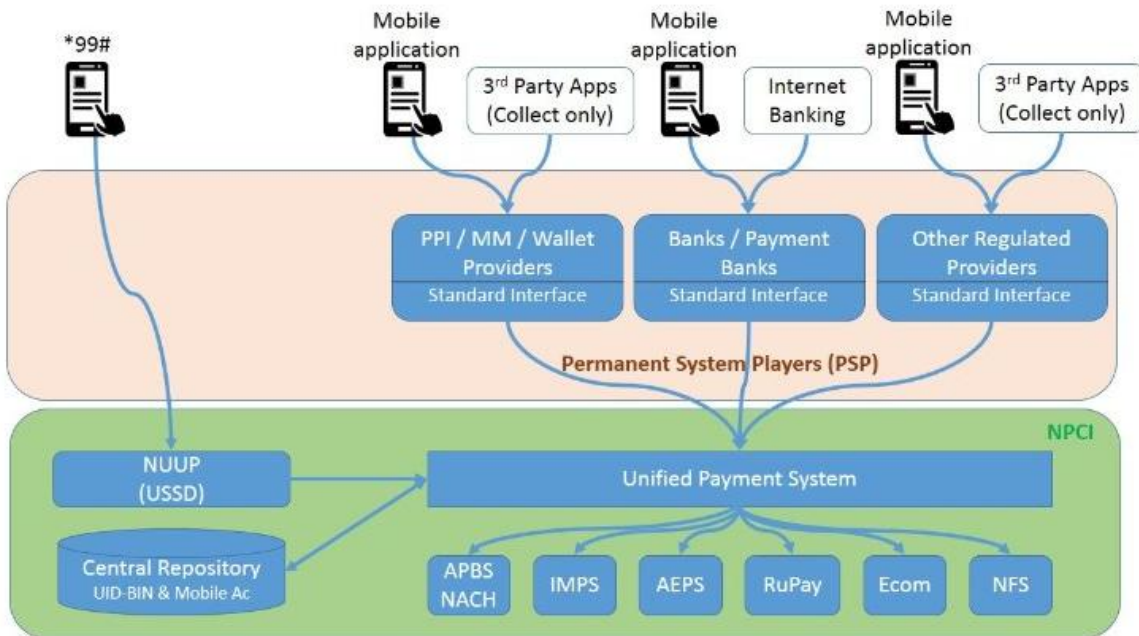
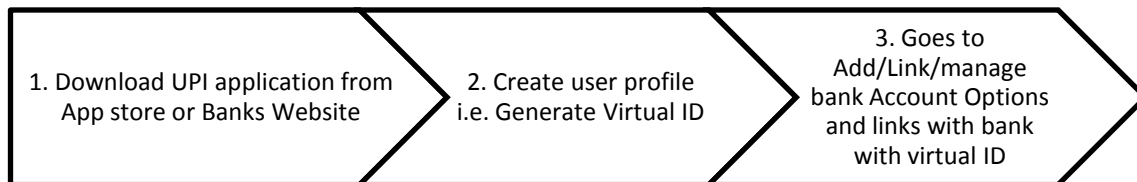


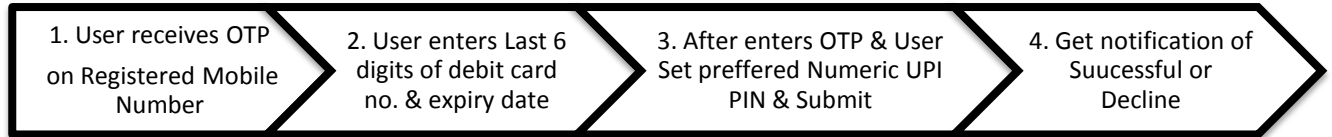
Figure 3: \*Source: <http://upipayments.co.in/upi-payment-system>

**Process of UPI Access:**

**1. UPI application Registration Process:**



## 2. Create UPI – PIN:



### Different Transaction done through UPI:

#### A. PUSH – sending money using virtual address

- User logs in to UPI application
- After successful login, user selects the option of Send Money/Payment
- User enters beneficiary's/Payee virtual id, amount and selects account to be debited
- User gets confirmation screen to review the payment details and clicks on Confirm
- User now enters UPI PIN
- User gets successful or failure message

#### PULL – Requesting money:

- User logs in to his bank's UPI application
- After successful login, user selects the option of collect money (request for payment)
- User enters remitters/payers virtual id, amount and account to be credited
- User gets confirmation screen to review the payment details and clicks on confirm
- The payer will get the notification on his mobile for request money
- Payer now clicks on the notification and opens his banks UPI app where he reviews payment request
- Payer then decides to click on accept or decline
- In case of accept payment, payer will enter UPI PIN to authorize the transaction
- Transaction complete, payer gets successful or decline transaction notification
- Payee/requester gets notification and SMS from bank for credit of his bank account

### Different Apps used UPI Feature in India:

Below is the list of App that provides UPI Feature:

PhonePe	Paytm	BHIM app	MobiKwik
Airtel Payments Bank	Google Tez	Uber	Chillr
SBI Pay	iMobile	Axis Pay	BOB UPI

#### PhonePe

Most popular payment apps that allow users to transact using the UPI interface. This is considered to be one among the most preferred apps for UPI. The app was founded in 2015 and is powered by Yes Bank.

#### Paytm

This mobile wallet app company has also collaborated with the UPI platform to provide customers the facility to transact and transfer funds in an easier manner. Customers can add money into their Paytm wallets with the UPI ID. Along with other payments options such as debit/credit card, net banking, etc., UPI is also one among them. Customers can also initiate collect money requests through Paytm with UPI. After the remitter accepts the payment request, the money is added to the Paytm wallet.

### **BHIM app**

The BHIM (Bharat Interface for Money) app has been developed by the National Payments Corporation of India (NCPI). It provide very user friendly interface from of its simplicity, also offers a very secure interface. This payment interface comes with all the essential features. Funds transfers can be initiated either through VPA, QR code or bank account number and IFSC code.

### **MobiKwik**

This Indian payments network also joined the UPI interface. All Mobikwik customers can use UPI to add money into their wallet. They already provided various services such as fund transfer using debit/credit card, net banking, cash pickup and cash deposit. The e-wallet service provider also has tied-up with various e-commerce merchants.

### **Airtel Payments Bank**

This payments app has also integrated with the UPI system to allow hassle-free digital payments through its app. The app will enable users to create VPAs and link their bank accounts. The main advantage of this payments bank is that payments can be made both offline and online.

### **Google Tez**

This app is launched by Google. It is also very frequently used by the different user to perform UPI functions. This app available in many Indian languages such as Telugu, Tamil, Marathi, Kannada, Gujarati, Bengali, and Hindi.

### **Uber**

Now, Uber has included UPI as one of the modes of payment. You can pay for your Uber rides with this interface.

### **Chillr**

This payments app has made available UPI as one of its payment methods. This app had been providing fund transfer facility through IMPS before it joined the UPI bandwagon.

### **SBI Pay**

This is a State Bank of India (SBI) app that is specially built for UPI requirements. The main advantage of this app is that even those who do not hold an account in SBI can use the app to send and receive money using a VPA. The app is very simple to use and one can easily register for the service after downloading the app.

### **iMobile**

The UPI interface can be used through the iMobile and Pockets app offered by ICICI Bank. The app can be downloaded from Google Play store. To send money through this app, you have to go to the 'Funds Transfer' option and click on the UPI method.

### **Axis Pay**

Axis Bank is one of the other banks that has launched a UPI enabled platform for its customers. This comes with a very user-friendly interface and various other features.

**BOB UPI**

The BOB UPI app has been launched by Bank of Baroda and can be downloaded from Google Play Store. One of the advantages of this app is that it provides customers certain additional features that are not available on other UPI apps.

The UPI interface is changing the way digital payments are being made in the country. Just about 52 banks in the country have collaborated with UPI to provide customers the service. While most banks have developed their own UPI app in their existing mobile apps, other banks do not have UPI, while some banks have partnered with third parties to provide customers’ access to UPI.

There a number of UPI apps in the market and there are more and more such apps that are being launched. Another important point to remember is that you can use any UPI app to link your bank account Therefore all UPI apps are interoperable. For example, a customer can use or connect a Yes Bank account on the ICICI Pockets app.

A report generated by ASSOCHAM, India In 2017 revealed that- “Currently about 74 crore debit and credit cards are being used, while about half a billion population is using internet, there are 102 crore mobile phones, 110 crore Aadhar and more than 20 crore Jan-Dhan accounts, so the complete ecosystem has already been put in place for using digital payment mode. The number of digital financial transactions made through Unified Payments Interface (UPI) and Unstructured Supplementary Service Data (USSD) mode has grown exponentially by 3,574 per cent and 10,603 per cent respectively till 18th January 2017”.

**Comparison table of Transaction value of Different Electronic payment System up to March 2108**

<b>Electronic Payment Systems - Representative Data (Updated as on March 06, 2018)</b>							
<i>Value in Rs. billion</i>							
<b>Data for the period</b>	<b>RTGS</b>	<b>NEFT</b>	<b>UPI*</b>	<b>USSD**</b>	<b>Debit and Credit Cards at POS &amp;</b>	<b>Mobile Banking</b>	<b>Total</b>
	value	value	value	value (in Rs. thousand)	value	value	value
Nov-16	78479.2	8807.8	0.9	7302.6	352.4	1244.9	96187.8
Dec-16	84096.5	11537.6	7.0	103718.4	522.2	1365.9	201247.6
Jan-17	77486.1	11355.1	16.6	381760.2	481.2	1206.7	472305.9
Feb-17	74218.8	10877.9	19.0	357055.2	391.5	1080.0	443642.4
Mar-17	123375.8	16294.5	23.9	337962.4	416.2	1499.9	479572.8
Apr-17	88512.2	12156.2	22.0	301650.5	431.4	1443.8	404215.9
May-17	90170.5	12410.8	27.7	316723.7	450.8	1940.7	421724.2
Jun-17	92812.6	12694.2	30.7	313277.0	468.2	1584.7	420867.4
Jul-17	87149.3	12011.6	33.8	302097.8	439.3	1019.2	402751.0
Aug-17	89163.4	12500.4	41.3	294239.4	457.1	1033.0	397434.5
Sep-17	102348.1	14182.1	52.9	323578.5	478.2	1121.6	441761.5
Oct-17	92056.1	13851.3	70.3	299071.8	530.5	1168.7	406748.7
Nov-17	98410.5	13884.0	96.4	287309.6	483.3	848.4	401032.2
Dec-17	100907.8	15779.2	131.4	299367.3	528.7	921.5	417635.9



Jan-18	107488.4	15374.1	155.4	290020.0	521.9	928.7	414488.5
<b>Feb-2018</b>							
<b>Total</b>	<b>91765.6</b>	<b>14843.9</b>	<b>191.0</b>	<b>270260.0</b>	<b>465.9</b>	<b>945.0</b>	<b>378471.4</b>

Table :1 \*\* Source: [http://rbidocs.rbi.org.in/rdocs/content/docs/ELECT07022016\\_A.xls](http://rbidocs.rbi.org.in/rdocs/content/docs/ELECT07022016_A.xls) (NPCI reports)

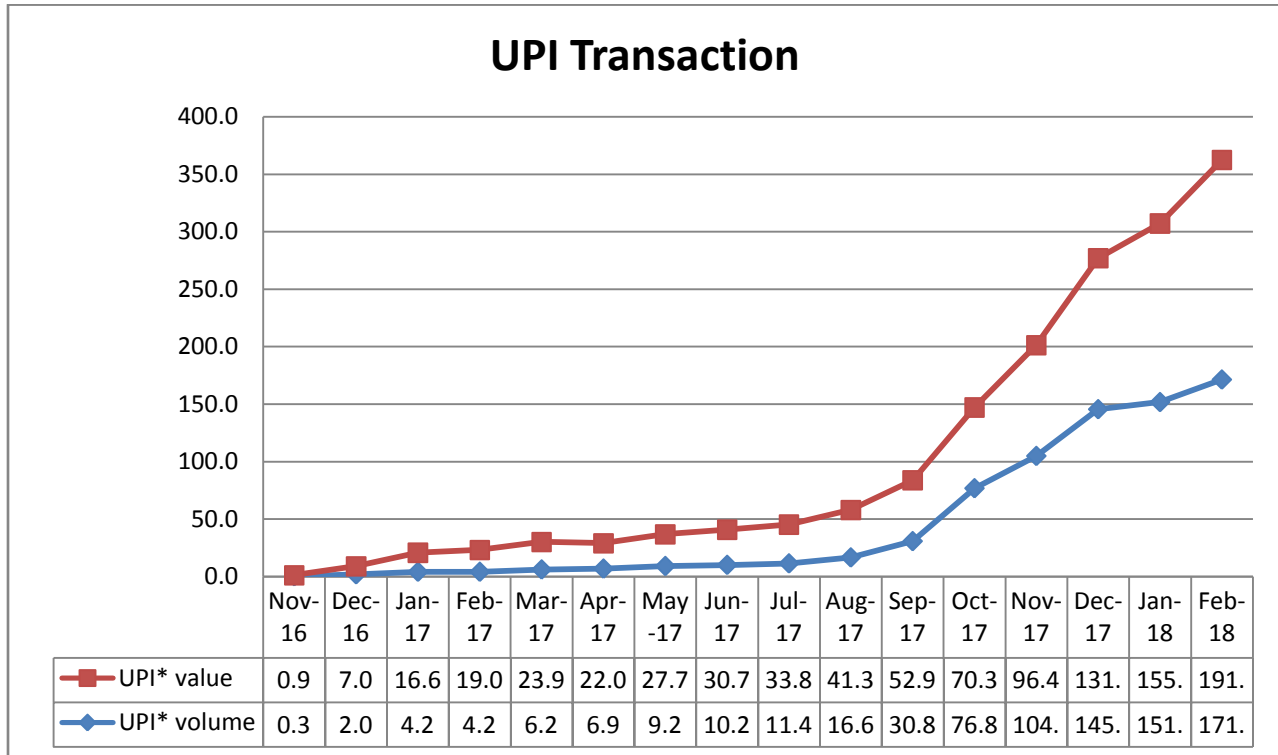


Chart 1: Growth of UPI Transaction

The Graph shows the increasing ratio in the Transaction of UPI method with the growing time. This means with the increase in the usage of UPI apps the transaction of Value & volume is also increases. However, with the overall analysis of the above table other from Electronic Payment System UPI method are still not used frequently used or it is not used in the Transaction of large volume or Value. UPI Method of Digital transaction can be considered in the introductory phase from the consumer point of view.

**Benefits of UPI:**

- Speedy Transaction are take place i.e. transactions are done on one Touch technology.
- Available 24\*7 for Transaction or Payment settlement.
- Provide safe, protected & convenient environment to both Sender & Receiver.
- Gives a Universal Platform to banks for performing Transaction.
- Use personal mobile phones as a main device to perform all transactions.
- Different Discounts, Offers & cash back Scheme are also available for customers on each transactions.

### **Challenges of UPI:**

1. Both the parties willing to make Transactions have their UPI –ID or registered mobile no. in their Bank Account.
2. In case of Failure of transaction Grievance redressal is difficult for customer.
3. UPI app is not software compatible. Currently, it is working only on Android operating system.
4. After demonetization, Indian citizens are more shifts towards the Digital Payment options, i.e. to e-Banking, M-Banking etc. so customer's takes time to move towards the UPI transaction as the technology are not very well known by them.
5. Only One or Two apps (such as- Paytm, Phonepe) are most popular among the citizens of urban Population, Rural area consumers are still not aware of this existing technology.
6. Consumers focus majorly on Security issues i.e. in case if the mobile is stolen than its bank details & account are unlocked by anyone. Thus, some customers are not in support to install UPI apps in their phones.

### **CONCLUSION**

UPI developed the m-payment technology by facilitating mobile phone to be used as a main payment device for giving and accepting payments. In contrast to all of payment systems it can be say that UPI is the most advanced payment system in the world. With its APIs set of standard, UPI has permissible to diverse banks to corresponds with each other and has allow interpretability between dissimilar bank payment systems. In UPI there are no mediators like in card networks, which allows for low transaction costs and instant settlement and also take days to complete the transaction and settlement process, where as UPI makes the payment in seconds. But, every emerging technology has some limitations & challenges. In order to improve the involvement & usage of UPI technologies, Banks & also government taking initiative towards the awareness of UPI among the citizens, so that the motive of Digital India has been accomplished.

### **REFERENCES**

- [1] Gochhwal, R. (2017). Unified Payment Interface—An Advancement in Payment Systems. American Journal of Industrial and Business Management, 7, 1174-1191. <https://doi.org/10.4236/ajibm.2017.710084>
- [2] Kakade R. & Veshne (2017), Unified Payment Interface (UPI) - A Way Towards Cashless Economy, International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056 Volume: 04 Issue: 11, Impact Factor value: 6.171 , Pp 762-766.
- [3] Mohapatra S. (2017), Unified Payment Interface (UPI): A Cashless Indian e-Transaction Process International Journal of Applied Science and Engineering 5(1): June, 2017: p. 29-42, DOI: 10.5958/2322-0465.2017.00004.1
- [4] Sagayarani D. (2017.) Digital Payments In India IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668 PP 28-33 [www.iosrjournals.org](http://www.iosrjournals.org) Name of Conference: International Conference on "Paradigm Shift in Taxation, Accounting,
- [5] Singh S. (2017). Study of Consumer Perception of Digital Payment Mode, Journal of Internet Banking and Commerce, An open access Internet journal (<http://www.icommercecentral.com>) , December 2017, vol. 22, no. 3
- [6] Thomas R. & Chatterjee A. (2017). Unified Payment Interface (UPI): A Catalyst Tool Supporting Digitalization – Utility, Prospects & Issues, International Journal of Innovative Research and Advanced Studies (IJIRAS), Volume 4 Issue 2, February 2017 ISSN: 2394-4404
- [7] Unified Payments interface-UPI (2016). Retrieved from [www.cashlessindia.gov.in/upi.html](http://www.cashlessindia.gov.in/upi.html).
- [8] <http://digidhan.mygov.in/pages/pdf/sbi/NPCI%20Unified%20Payment%20Interface.pdf>
- [9] <http://upipayments.co.in/upi-payment-system>
- [10] [www.npci.org.in](http://www.npci.org.in)
- [11] [www.rbi.org.in](http://www.rbi.org.in)
- [12] [www.traigov.in](http://www.traigov.in)