

# UNIFIED PAYMENT INTERFACE (UPI) - A WAY TOWARDS CASHLESS ECONOMY

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**Abstract** - After Demonetization there was huge requirement for currency notes but government was unable to provide required quantity of currency notes and also Indian government wanted to promote cashless transactions. Unified Payments Interface (UPI) is a payment system launched by National Payments Corporation of India and regulated by the Reserve Bank of India which facilitates the instant fund transfer between two bank accounts on the mobile platform. UPI is built over Immediate Payment Service (IMPS) for transferring funds using Virtual Payment Address (a unique ID provided by the bank), Account Number with IFS Code, Mobile Number with MMID (Mobile Money Identifier), Aadhaar Number, or a one-time use Virtual ID. An MPIN (Mobile banking Personal Identification number) is required to confirm each payment.

UPI has made digital transaction for individuals as easy as sending text messages. service is available 24X7, not like RTGS or NEFT which don't work on holidays or during non-banking hours. This will bring enormous efficiency in the system and help India become a truly cashless economy.

**Key Words:** Cashless, Digital, Simple, secure, Security, E commerce, Aadhar Integration

## 1. INTRODUCTION

Over the ten years, India has made little slow but steady progress in E-Payments. Till now many methods are invented in E Payments to digitalize the current Banking system. So UPI (Unified payment Interface) is one of them. India is large scale country and so many are unbanked or don't know how to avail the banking services which are easy and secure. But due less literacy rate and unknown factor led people, not to use or facing difficulties in using Banking services. So we needed to overcome these difficulties and to make payment process easy.

Some of the challenges currently India facing in E Banking sector are

- According to the data provided by RBI, number of E payments or non-cash transactions stands to 6 per person per year

- About 1 crore plus stores have card acceptance infrastructure but currently 6 lakh stores using this facility
- According to the data provided by RBI, out of 6 lakh villages in India, only less than 1 lakh villages are using banking services

To make E Banking sector more easy, convenient, secure Government started NPCI (National Payments Corporation of India) in 2009, which controls all E Payments in India and it is setup with guidance and support of Reserve bank of India(RBI) and Indian bank association (IBA). After the starting NPCI, it has taken many steps to simply and provides single interface payment system across all the systems. Some of the key drivers are

- **Simplicity:** Paying and receiving money should be easy as making calls or operating a basic mobile phone. When you want to send money to any person, the recipient should be easily found with less details means if you have his phone number or Aadhaar number or virtual address, then you don't have to enter multiple details like Account number, IFSC code and other details.
- **Adoption:** When you are sending money to any person, there should not be like sender should have same mobile as receiver or vice versa. So system should be universal. User can send their money to anyone who have Bank account with easy process. Similarly, it should allow full interoperability between multiple identifiers such as Aadhaar number, mobile number, and new virtual payment addresses.
- **Security:** The main and most needed thing is the security. The end to end protection between sender and receiver should be more. Data reading from smart phone to server should be strongly encrypted. Similarly the process of sending money or receiving should not be complicated because of security reason. It should be simple, convenient with all securities.

- **Cost** - Considering the fact that about 150 million smartphone users exist today and that number is expected to grow to 500 million in the next 5 years, solution should offer a mechanism to take full advantage of that. Use of mobile phone as the authentication (credential capture) device, use of virtual payment addresses, and use of 3rd party portable authentication schemes such as Aadhaar should allow both acquiring side and issuing side cost to be driven down. This allows banks and other payment players to focus on core business and allow half a billion phones to be the primary payment device in conjunction with other 3rd party authentication.

### 1.1 Need For the Study

UPI is an abstraction over standard payment transfer mechanism like IMPS. It helps to hide sensitive account information along with consumer convenient. Also UPI is fast and does not involve the costs like debit card or net banking. By using statistics government and other bodies the study will approach to understand, discuss and bring out the issue relevant to the title.

### 1.2 Objectives of UPI

- Providing instant payments via mobile, web and other applications
- Providing more secure, convenient payment service to both sender and receiver channels
- It allows banks and other players to innovate and offer a superior customer experience to make electronic payments convenient and secure
- Supports the growth of e-commerce, while simultaneously meeting the target of financial inclusion.
- Virtual payment addresses, 1-click 2-factor authentication, Aadhaar integration, use of payer's smartphone for secure credential capture, etc. are some of the core features.

### 1.3 Common Features of UPI Systems are

- Ability to use personal mobile as the primary device for all payments
- Ability to use Aadhaar number, mobile number, card number, and account number in a unified way. In addition, ability to pay and collect using "virtual payment addresses"
- Make payments only by providing an address with others without having ever provide account details or credentials on 3rd party applications or websites

- Ability for sending collect requests to others
- Ability to make payments using 1-click 2-factor authentication all using just a personal phone without having any acquiring devices or having any physical tokens

### 1.3 Common Features of UPI Systems are

1. Payer and payee account details for authorization
2. Authentication credentials (password, PIN, biometrics, etc. as required for debit, can be bank provided or 3rd party provided such as UIDAI)
3. Transaction amount
4. Transaction reference
5. Time limit
6. Other details such as location, product code, mobile number, device details, etc. as required

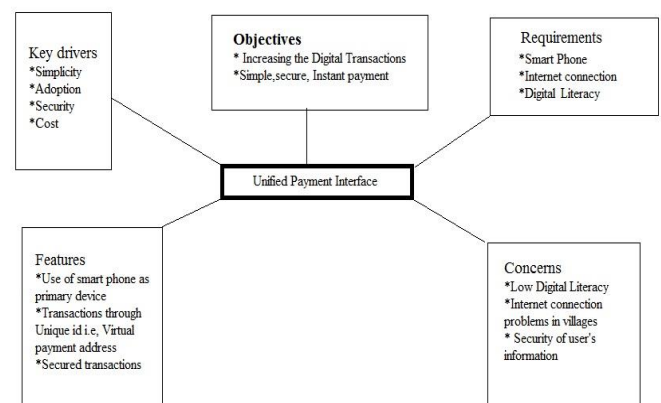


Fig- 1: Conceptual Structure of Unified Payments Interface

## 2. Research Methodology

UPI has been launched recently. Therefore, the data has been collected from government and other bodies and compared different mode of payments and their number of transactions are collected. Information has been drawn from e-journals, articles from renowned analyst and newspapers. Thus, the study is conceptual and descriptive type.

## 3. Literature Review

India has seen enormous growth in smart phone selling in recent years and will have 530 million smart phones in 2018 (According to a new study by U.S.-based media agency Zenit). Through Pradhan Mantri Jan Dhan Yojana 30.45 crore accounts and 22.93 cards provided for universal access to Banking. To increase internet service in villages or rural area, government providing Wi-Fi zone near to 250000 Gram Panchayats and this will lead to adoption of data services.

These all infrastructure will help launch of UPI will provide low-cost acquisition infrastructure by allowing smart phones to substitute costlier point of sale (PoS) devices Rajiv Anand, 2016).

Excitement over the growth of mobile payments perpetuated the phenomenon of disconnected Islands and disjoint experiences. With UPI there is no need of any other payment app at all. On the other hand if one wants to keep a particular mobile wallet UPI could enable the interoperability of wallets allowing users to transfer funds from one wallet to another. Since RBI has allowed banks to become PSPs (Payment Service Providers) mobile wallets are cut of the picture at the moment. So if mobile wallets represent any threat to proprietary solutions (banks), UPI comes as a boon for them.(Kate, 2016).

### 3. Working Mechanism of UPI

UPI can be used for sending money and receiving money, who have smart phone with internet connection and Bank account. Figure 2 shows complete mechanism of paying and sending through UPI.

- First Step

To get started, first user has to download UPI application from Google play store or any other 3<sup>rd</sup> party sources. It is not mandatory that you should download application with respect to your Bank, You can download any other UPI application and you can use it.

- Second Step

Then by using your mobile number, Bank accounts linked to your mobile number will be searched. Then by entering last 6 digits of Debit card, your bank will be registered with UPI application.

- Third Step

A VPA (virtual payment address) is to be created by user in next step. The VPA is the unique address like email id and every user will get unique id and it is attached to their Bank account and M Pin is set for Bank account. For example if you are using Phonepe application, then you will get VPA as user1demo@ybl,985695826@ybl.

User can send and receive payment worth minimum Rs 1 up to Rs 100000 per day. As current NPCI is not charging for the transactions. User will get his payment notification in format of IMPS in Bank account statement.

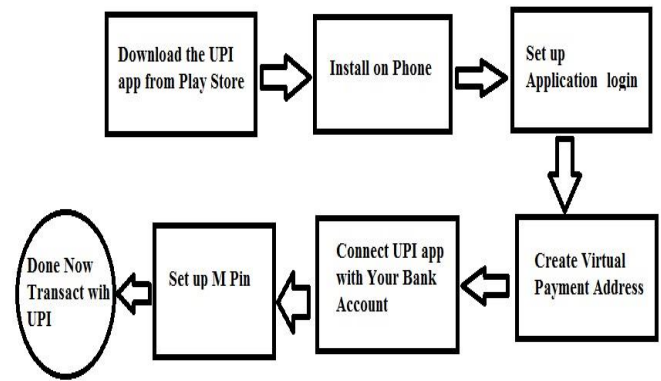


Figure 2 : Working Mechanism of UPI Application

### 4. Data Analysis

Data for the period	RTGS		NEFT		CTS*		IMPS*		NACH*	
	volume	value	volume	value	volume	value	volume	value	volume	value
Nov-16	7.9	78479.2	123.0	8807.8	87.1	5419.2	36.2	324.8	152.5	606.6
Dec-16	8.8	84096.5	166.3	11537.6	130.0	6811.9	52.8	431.9	198.7	626.8
Jan-17	9.3	77486.1	164.2	11355.1	118.5	6618.4	62.4	491.2	158.7	541.4
Feb-17	9.1	74218.8	148.2	10877.9	100.4	5993.9	59.7	482.2	150.5	592.0
Mar-17	12.5	123375.8	186.7	16294.5	119.2	8062.8	67.4	564.7	182.1	829.4
Apr-17	9.5	88512.2	143.2	12156.2	95.3	6990.6	65.1	562.1	212.6	905.2
May-17	10.4	90170.5	155.8	12410.8	97.1	6745.9	66.7	585.6	194.4	692.4
Jun-17	9.8	92812.6	152.3	12694.2	91.9	6409.9	65.8	596.5	197.3	708.6
Jul-17	9.4	87149.3	148.1	12011.6	92.2	6342.5	69.1	604.8	204.3	771.7
Aug-17	9.5	89163.4	151.6	12500.4	92.1	6224.3	75.7	651.5	205.2	752.4

Figure 3 :

UPI*		USSD**		Debit and Credit Cards at POS <sup>§</sup>		PPI <sup>¶</sup>		Mobile Banking		Total	
volume	value	volume (in thousand)	value (in Rs. thousand)	volume	value	volume	value	volume	value	volume	value
0.3	0.9	7.0	7302.6	205.5	352.4	59.0	13.2	72.3	1244.9	671.5	94004.2
2.0	7.0	102.2	103718.4	311.0	522.2	87.8	21.3	70.2	1365.9	957.5	104055.3
4.2	16.6	314.3	381760.2	265.5	481.2	87.3	21.0	64.9	1206.7	870.4	97011.4
4.2	19.0	224.8	357055.2	212.3	391.5	78.4	18.7	56.2	1080.0	763.0	92594.5
6.2	23.9	211.2	337962.4	229.7	416.2	90.0	21.5	60.8	1499.9	893.9	149589.1
6.9	22.0	188.9	301650.5	231.1	431.4	89.2	22.3	61.0	1443.8	853.1	109602.2
9.2	27.7	192.6	316723.7	233.4	450.8	91.3	25.3	64.9	1940.7	858.5	111109.3
10.2	30.7	198.9	313277.0	232.4	468.2	84.7	24.1	77.1	1584.7	844.7	113745.2
11.4	33.8	190.7	302097.8	237.6	439.3	88.7	25.1	69.5	1019.2	861.1	107378.4
16.6	41.3	191.8	294239.4	243.0	457.1	89.7	27.2	70.8	1033.0	883.4	109817.9

Fig- 4 : Various types Transactions details

(Source : <https://rbi.org.in/scripts/NEFTView.aspx>)

NEFT – National electronic funds transfer

CTS – Cheque truncation system

IMPS – Immediate payment service

NACH – National automated clearing house

UPI - Unified Payments Interface

USSD - Unstructured Supplementary Service Data

POS – Point of sale

PPI – Prepaid payment instrument

The above table represents Electronic Payment done through various channels. The major contribution is from RTGS, NEFT and CTS. These three contribute 98.24% of total payment value. As we see the table, number of transactions through UPI is increasing and it contributes only 0.037% of total contribution which is negligible compared to other payments. But UPI is replacement for small scale payments like Mobile banking. Because it has limit of 1 lakh. Large scale payments done through RTGS, NEFT and CTS but major payments or frequently using payments in India are done in retail store, small stores which are in small amount.

## 5. Findings

- If you are sending money from UPI application, then receiver should have to register to UPI application at other end. Otherwise you cannot able to send money by mobile number, then you can send money by entering account number and Ifsc code
- Till now UPI supports only for Android users so other users should wait for NPCI for developing software for other platforms
- UPI is still in starting stage and common problems like server issues are more
- There is no separate customer care line if any problem in payments like payment in pending and payment is failed but money is not refunded
- UPI is in initial stage, so most of the Banks are adopting this technology and this leads to problem in maintaining servers 24 hours
- UPI mainly targets the smart phone users and the number of smart phones are increasing day by day but the Digital literacy is too less. This will affect the UPI
- Till now, there is no transaction charge but for maintaining servers and for other infrastructure facility Banks may start applying charges
- UPI mainly requires Internet connection but in India Data connection is not available everywhere

UPI requires Mobile number which is connected to Bank account but most of the times still in rural areas there is no link between mobile and bank account.

## 6. CONCLUSIONS

- Currently India is developing at the rate of 6 to 7%.we know that cashless payment will definitely

reduce or stop the burden of circulating hard cash throughout the nation

- From above study, it is concluded that UPI will definitely change the way we are transacting now and transforming into digital payments where each person's smart phone will be primary device for all payments
- UPI is in initial stage, When UPI is fully operational means when all the banks join the UPI then it would be wide beneficial for banking sector and customers in terms of sending and receiving money
- We know that in recent time, there is enormous growth in smart phone users and penetration of internet in rural services. This leads big potential for adoption of UPI by Indian customers
- UPI creates convenience of transacting without knowing Bank details means knowing phone number or virtual address with high security and simple process. From all above points we can conclude that UPI will gradually end the cash payments and reducing circulation of currency notes. This will leads to a transparent system and a cash less economy

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