UNIFIED PAYMENTS INTERFACE IN INDIA: A REVOLUTION IN THE FIELD OF E-COMMERCE

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ABSTRACT

Over decades, India has made slow but steady progress in the field of electronic payments. The innovations in payments have leveraged major technological innovations in each era. However, given the scale of our country, and that so many are unbanked, we cannot rest on our laurels. Payment system in India has undergone rapid changes during the past few years. The Vision Document on Payment Systems released by the Reserve Bank of India states several measures for building a ‘less cash’ society. The adoptions of mobile and card payment systems are two key components of this initiative. This paper presents an overview of a transformational project initiated recently by the National Payments Corporation of India (NPCI). This project aims to empower the bank customer to ‘send’ and ‘collect’ money in real time with just an e-mail, like a financial address, both for person-to-person (P2P) payments and Business to Consumer (B2C) Collect. This Unified Payment Interface document provides a payments architecture that is directly linked to achieving the goals of universal electronic payments, a less cash society, and financial inclusion, using the latest technology trends, laid down in the RBI Payment System Vision Document.

Keywords: Cash on delivery (COD), mobile PIN (MPIN), National Payments Corporation of India (NPCI), payment service provider (PSP), Unified Payments Interface (UPI).

1. Introduction

The banking system in India was invented to create a platform for the transfer of money without any physical involvement of currency. The payer used to give instructions to its bank to transfer a certain amount of money to the payee. The bank followed the instructions on the basis of a verified signature system of the payer. This resulted in a cash-heavy economy. As we all know that the cost of maintaining a cash-heavy economy is very high for any country. The cost is not only the maintenance cost but also the cost of proliferation of black money. Hence, efforts were made relentlessly for converting India into a cashless economy which has been made possible with the evolution of internet banking. The digitalization of the banking system in the last few years and the advent of the electronic payment systems like NEFT, RTGS etc., has resulted into instant transfer of money from sender to the recipient. However, it still is in the nascent stage and its success rate is not very high because of various reasons. Firstly, the penetration of internet-banking system to every strata of population is not that strong and secondly, there are issues in the networking devices.
which created safety and security hazards for the participants more so because it requires the banking details of the recipient for its functioning. This emphasises that the solution to this problem lies in the invention of an innovative platform i.e. Unified Payment Interface (UPI), which is quite different from the existing payment devices.

The two very promising developments in the field of digitalization, which have given a boost to UPI, are the advent of smart phones and rapid growth in the number of households having bank accounts throughout the country due to the innovative JAN-DHAN YOJANA of the present government.

UPI is recently launched by National Payments Corp. of India (NPCI) to extend the vision of RBI to transform the Indian economy from a cash-intensive to cash-less form. The functioning of UPI is based on a set of standard application programming interfaces (API) which provide a payment architecture for transfer of money as an Immediate Payment Service (IMPS) platform.

The three main entities of the UPI system include:

**PSP** (Payment System Players) which provides an interface for the payer and the payee.

**Banks** that provide the underlying accounts and these two i.e. PSP and banks can be same also.

**NPCI** that acts as a central gateway for carrying out effective credit and debit transactions.

The distinguishing feature of this platform, which establishes its unique identity in the field of digital payments, is its ability to allow a direct and immediate transfer of money from the account of the sender to that of the recipient without any requirement of the banking details of the later. In addition to this, it is a 24/7 device which is not dependent on the working period of the banks for its success. Another feature which stands it apart from other devices is its ability to function without any need to pre-load the wallet of the payer.

It is visible from the above description that UPI has the power to fast-track our country to cash-less economy with the help of smartphones.

However, there are still certain bottlenecks which need to be addressed for an uninterrupted functioning of this system.

This study highlights the process involved in the functioning of this innovative technique as well as the challenges it is going to face in the near future. Along with that the key advantages associated with it, which will revolutionise the immediate payment and settlement system in the country, are also explained.

The study is quite significant in the present scenario as it brings forward not only the advantages that can be derived from this revolutionary payment system but also discusses the hurdles in its implementation, which are still persisting in our country.

The study further gives a very clear picture of the relevant issues in our banking system which need to be addressed by the government to make it a success story.

**2. Research Methodology**

The current study is an exploratory research to understand, discuss and bring out the
issues relevant to the innovative payment mechanism in India. It has used the secondary sources of data. The data collection is done from the websites of government & financial regulators as well as press-release and articles from RBI, NPCI, TRAI, IBA and regulatory bodies. Information has been drawn from e-journals, articles from renowned analyst and newspapers also.

3. Process of UPI

The NPCI, which is a new network (involving around 1,200 banks) for various payments system services, aims to make this real-time payment service a universal mode of completing ecommerce and bill payment transactions. It comprises ten steps:

*Step 1:* The payee initiates the transaction to collect Rs. X — from the payer through the HDFC Bank PSP application. Here, the payee should input the virtual address of the payer and the amount to be collected.

*Step 2:* The HDFC PSP application captures the virtual address of payer, say ‘John@sbi’ and sends it to NPCIUPI. While communicating the same to NPCI-UPI, HDFC PSP also provides the linked account no. and IFSC code of the payee.

*Step 3:* The NPCI-UPI on checking the handle as ‘@sbi’ sends the transaction to SBI, which is the PSP of the payer:

- The SBI PSP app will send a notification to the payer to authenticate the transaction by entering the mobile PIN (MPIN).
- The payer confirms the authentication using the MPIN.

*Step 4:* Upon successful authentication, the SBI PSP will also provide the underlying account no. and IFSC code of the payer to NPCI-UPI. Now NPCI-UPI has the details of the remitting bank (the debit bank) and the beneficiary bank (the credit bank) for settlement.

*Step 5:* NPCI-UPI will send a request to the remitting bank (ie Axis Bank) to debit the payer account.

*Step 6:* The remitting bank will send the response to the UPI confirming that the payer account is debited.

*Step 7:* NPCI-UPI will send a request to the beneficiary bank (ie ICICI Bank) to credit the payee account.

*Step 8:* The beneficiary bank will send a response to the UPI confirming that the payee account has been credited.

*Step 9:* The UPI will forward a credit response to the payee’s PSP.

*Step 10:* The payee’s PSP will confirm to the payee that his/her account is credited and the transaction is completed, followed by an SMS confirmation to both the remitter and beneficiary.

The new process will ride on the existing infrastructure of IMPS, which facilitates money transfer from any bank/wallet account to any other bank/wallet account ‘instantly’ and 24/7.

4. Uniqueness of UPI

First, UPI enables ‘instant acquire’, which become no longer viable with IMPS. P2P payment in ‘push’ mode works thoroughly, but there has been no facility until now to ‘pull’ payments on a actual-time basis not like card payments or net banking payments,
in which the client keys inside the password or PIN on the issuer bank site, in UPI the customer keys into the acquiring bank/service provider website the use of the library provided by means of NPCI. This reduces the hopping between various websites and makes transaction processing simpler without any compromises on safety. Cash on delivery (COD) transactions can now be completed by delivery staff by collecting the money electronically while delivering goods. A biller can take payment for bills from consumers by automating the collection process on the due date, thereby supplementing the existing Electronic Clearing Service (ECS, debit)/National Automated Clearing House (NACH, debit) process. Clubs and schools can collect the fees. A landlord can ‘pull’ money from a tenant. There are multiple applications of this kind for on-line/face-to-face payments.

CEOs of four prominent e-Commerce players (IRCTC, Flipkart, MakeMyTrip and Paytm) who were speakers at the inaugural function for UPI shared their thoughts on UPI and said unanimously that UPI would provide an enhanced shopping experience on websites. All of them are in the process of integrating UPI into their ticketing/shopping applications.

Secondly, UPI has the facility to identify a bank customer with an e-mail-like virtual address. A customer can create a unique financial address in his/her bank linked with the bank account number at the backend. The customer will use only the virtual address while dealing with others, without sharing account details.

Thirdly, UPI will operate primarily on smart phones, thereby leveraging the ever increasing utilities of smart phones. Although the current base of smart phones in India is about 300 million (as of December 2016), the number is growing fast and is likely to reach 500 million in two to three years’ time. Smart phones have now become affordable, and the 4G mobile network covers almost the whole country. National broadband and the network of mobile hotspots are growing.

Fourthly, UPI will enable single-click two-factor authentication, where the mobile itself will be the first authentication factor, and the unique hardware identification of the smart phone and one time password (OTP)/static mobile PIN the second factor. More and more banks in India are migrating to OTP as the preferred mode of authentication technology for online transactions. This would make UPI implementation faster than any other online payment systems launched previously.

Fifthly, UPI has the unique feature of interoperability, whereby one bank can acquire the customers of other banks for the purpose of payment transactions. For instance, a customer of Bank A can take the UPI application of Bank B and carry out all types of push and pull transactions from the application provided by Bank B. Bank B’s role is to provide an enhanced user experience by way of customised payment screens and analytics. Although the authentication of a transaction will always be from the issuing bank, the acquiring bank can facilitate faster transaction processing by being the acquirer of merchants. Banks will also be competing with each other to provide simple and user-friendly solutions without compromising the regulatory guidelines on two-factor authentication. A few banks are enhancing security without compromising simplicity.

4. Challenges with UPI
Every innovation brings with it several challenges and threats some of which are gradually treated over by time and some linger on forcing the user to make the adjustment and UPI is not an exception. Small but significant UPI has its own challenges which are as follows:

- A foremost challenge a user of UPI has to face is the dilemma whether the party to whom he wishes to make payment is registered on UPI or not and if he/she is registered then what is the VPA (Virtual payment address) or registered mobile number of that person.

- The four party model of UPI where the customer of one bank is at the liberty to use the application of another bank creates a gap and a quandary in cases of failure of transaction and makes grievance redressal difficult as the customer may remain confused as to whom should the problem be addressed to. Many a times the customer takes his issue to the bank which holds his account but at the same time the transaction may not have been visible to his bank as it was performed with the UPI application of some other bank.

- Another challenge the UPI faces is that in framing its interface the NCPI creates and offers only the backend solution and lets its partner bank create the front end application and because of this many banks have tried to adjust the UPI into their existing apps thus giving rise to a range of issues.

- Dissimilarities in the screenplay and options for UPI app for various banks adds to the confusion of the customer and also makes training and demonstrations a bit difficult to the new user.

- One obvious challenge which wills detriment the use of UPI is that it currently works only on android. Thus Smartphone with other inbuilt software would not be able to work with UPI. And it is less likely that a customer having a Smartphone using software other than android will immediately switch his device to an android one just to adopt UPI.

- Although India can boost of having position of second largest Smartphone user base in the world out beating even the US (Indian Express,2016), the penetration of Smartphone within the country especially the rural penetration is still comparatively less.

- Banks aren’t completely computerized which adds to the list of challenges for UPI. Implementing UPI will mean training merchants, staff, retailers, improving point of sale systems and upgrading existing technology among others all of which translates to significant investments. Anyhow these will be required to ensure wide scale adoption of UPI.

- Despite the propagation and promotion of UPI and other digitalized payment modes by the government and even after the strong move on demonetization, people have shown a huge dependence on cash. This is mainly due to lack of financial literacy, education, awareness and above all strongly
inbuilt attitudes and habits, which will take a considerable time to reform.

5. Conclusion:

Thus, it can be concluded from the above discussion that India still is a cash-heavy economy in which the penetration of digital devices like credit card & debit card is very low. Debit cards are more a substitute of cash rather than a mode of digital payment. In such a scenario UPI has an immense potential to establish itself as a master stroke for revolutionising digital payment system in India.

In addition to this, the UPI would take the smart phones to its next level by establishing it as the most important link for immediate transfer of money, at any point of time, at a click of a button. Moreover, a plethora of services that are still outside the ambit of digital payment may come under this umbrella due to this innovation. The secured and highly encrypted transactions designed in this system will also enhance the confidence of the risk-averse users who still hesitate to use cards for these services. Hence, for successful implementation and functioning of this system, the penetration of smart phones is a pre-requisite eventually making cards redundant for digital payments.

In this direction government has also taken an anti-corruption, pro-technology step by initiating schemes like JAM (Jan Dhan, Aadhar, and Mobile), to establish digital benefit transfer in the country. This will not only curb black money transactions but will also reduce terrorism in the coming times. India has over a billion mobile connections, with around 240 million smartphone users and is expected to grow to 520 million by 2020 (BCG estimates) [1]. The National Optical Fiber Network initiative will connect 250,000 gram panchayats across rural India and increase adoption of data services. The Pradhan Mantri Jan Dhan Yojana, through 226 million accounts and 183 million cards (as on 27 July 2016), has provided the infrastructure for universal access to banking. The issuing infrastructure is largely in place and the launch of UPI will provide a significant fillip in the proliferation of low-cost acquisition infrastructure by allowing smartphones to substitute costlier point of sale (PoS) devices.

It has been observed in the recent past that the establishment of the above mentioned schemes as well as the infrastructural development of banks have subsequently increased the e-payments in the country showing that the customers are willing to go digital provided they are given the user-friendly solutions in this direction. UPI is, thus, an appropriate step taken by RBI in these conditions to create an alternative for mobile wallets. It is also going to empower millions of Indians to move towards cash less economy in a smoother and faster way. Eventually, this will ease out the functioning of micro payments between buyers and sellers which will be beneficial for both the parties in the long run.

The above discussion clearly indicates that UPI has the capability to take India at a new level in the field of digital payment system. However, still India is a cash dominated economy with only 6-7% of electronic transactions [1]. Hence, to convert this cash dependent economy into a cash-less one, few steps are required to be taken not only by the government level but also by the citizens of India. The government can provide incentives for the electronically driven transactions to allure the individuals towards cash-less economy. It can also define a limit on cash transactions as well as on cash holdings by an individual. This can be regulated by linking the Pan-card of
every individual or business entity for any business transaction beyond a certain limit. The individuals can also support these initiatives taken by the government by participating in cash-less transactions and making the economy more transparent. The research can be further extended by incorporating the steps taken by the government at the ground level and its impact on the payment system of the country.

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