

## A STUDY ON GROWTH OF UPI (UNIFIED PAYMENT INTERFACE) IN DIGITAL EMPOWERMENT

**P.SATISH KUMAR**

Assistant Professor, Department of Management

CMR College of Engineering and Technology, Kandlakoya, Medchal, JNTUH, INDIA

### Abstract

*Payment and settlement systems in India have 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 studies Unified Payment Interface (UPI), a new age payment system introduced in India by National Payment Corporation of India. Unified Payment Interface is a mobile centric, real time interbank payment system which has the potential to transform and universalize digital payments in India. This study focuses to analyze the growth and trend of UPI transactions, to forecast the future volume of UPI transactions trend line projection method and to compare other payment systems for last one year. For this, the secondary data of all payment systems was collected from the National Payments Corporation of India (NPCI). For analysis descriptive statistics, moving average and simple regression analysis is used. By this study it is identified that even UPI was very slow and had limited response from the public, for the last six months it has drastic growth in terms volume and value due its unique futures from other payment systems.*

**Keywords:** National Payments Corporation of India (NPCI); Unified Payment Interface (UPI); Digital Empowerment

### Introduction

Unified Payments Interface (UPI) 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.

With the above context in mind, NPCI conducted a pilot launch with 21 member banks. The pilot launch was on 11th

April 2016 by Dr. Raghuram G Rajan, Governor, RBI at Mumbai. Banks have started to upload their UPI enabled Apps on Google Play store from 25th August, 2016 onwards.

### Uniqueness of UPI

1. Immediate money transfer through mobile device round the clock 24\*7 and 365 days.
2. Single mobile application for accessing different bank accounts.
3. Single Click 2 Factor Authentication – Aligned with the Regulatory guidelines, yet provides for a very strong feature of seamless single click payment.

4. 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.
5. Bill Sharing with friends.
6. Best answer to Cash on Delivery hassle, running to an ATM or rendering exact amount.
7. Merchant Payment with Single Application or In-App Payments.
8. Utility Bill Payments, Over the Counter Payments, Barcode (Scan and Pay) based payments.
9. Donations, Collections, Disbursements Scalable.
10. Raising Complaint from Mobile App directly.

### UPI - Benefits to the Ecosystem

- For banks UPI provides Single click Two Factor authentication, means compare to other payment systems it takes less time for authentication, and it is Universal Application for transaction among all the banks which takes less time for settlement between banks .It Leveraging existing infrastructure, no need to invest further implementation of UPI in infrastructure. And it is also secure, safer and innovative so no threats from hackers.
- For end customers also its so benefit as it is round the clock availability. And with single application customer can access different bank accounts, as it is working on Virtual ID is more secure, no credential sharing and its having single click authentication. Customer can raise complaint from mobile app directly.
- For merchants and individuals also it's useful. Seamless fund collection from customers-single identifiers. There is no risk of storing customer's virtual address like in Cards. Even it resolves the COD collection problem.

### Review of literature

India has over a billion connections with around 240 million smartphone users and is expected to grow to 520 billion by 2020 (BCG estimates, 2016). The National Optical Fibre Network initiative will connect 2500000 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 27th 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 lowcost 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).

Another landmark achieved through UPI is the usage of open source technology to build enterprise class architecture of high throughput and high volume. UPI is expected to Page 194 [www.ijiras.com](http://www.ijiras.com) | Email: [contact@ijiras.com](mailto:contact@ijiras.com) International Journal of Innovative Research and Advanced Studies (IJIRAS) Volume 4 Issue 2, February 2017 ISSN: 2394-4404 handle 10-15 thousand transactions per second [TPS] at its peak with daily volume of at least 10 million transactions. So, the backend architecture needs to be really robust, scalable and fast. The key point is that it did not use the expensive, commercially available app servers, message queues etc. The architecture is primarily build on open source software which is rarely used in a system of this scale. (Chakraborti, P, 2016).

Using UPI, merchants can now remind customers to pay. Merchants can also create part payments asking the customer to pay a minimum say 10 percent up front and remaining on delivery of product or service. They can even set up specific dates for the customer to pay by, simplifying the collection process that takes multiple phone calls and reminders today. Customers need not worry about their payment information being stored at the merchants' side. This would definitely help the small businesses for whom customer's trust level is low and the existing payment gateway costs are too expensive. Another point to ponder is why India has such less tax payer base

in a population of over 1.2 billion people. Is 98% of our population earning below 2.5 lakh per year? This is one of the issues that needs to be addressed and hopefully with many more transactions moving electronic and records of the same being available many more people should fall under the tax net be it small merchants, professionals etc. Will this segment of society adapt to electronic modes of payment so that the nation can benefit from higher tax is a question. (Navroze Dastur, 2016).

**Need of the Study**

Earlier studies focused on architecture of UPI procedure and working procedure as UPI system just launched one year before. And my study focus on what is the growth rate and what is the present status of UPI system in terms of no of transactions .This study will lead to make the decision regarding how it can be developed further and how it fulfills the goal of digital empowerment as UPI simple and secure even people with low financial literacy can easily use this UPI system.

**Table1 Value of different electronic payment systems (Updated as on March 31 2018)**

| <i>Value in Rs. billion</i> |          |         |        |       |       |      |          |                        |      |                |          |
|-----------------------------|----------|---------|--------|-------|-------|------|----------|------------------------|------|----------------|----------|
| Data for the period         | RTGS     | NEFT    | CTS    | IMPS  | NACH  | UPI  | USSD     | Debit and Credit Cards | PPI  | Mobile Banking | Total    |
| Mar-17                      | 78479.2  | 8807.8  | 5419.2 | 324.8 | 606.6 | 0.9  | 7302.6   | 352.4                  | 13.2 | 1244.9         | 102551.7 |
| Apr-17                      | 84096.5  | 11537.6 | 6811.9 | 431.9 | 626.8 | 7.0  | 103718.4 | 522.2                  | 21.3 | 1365.9         | 209139.5 |
| May-17                      | 77486.1  | 11355.1 | 6618.4 | 491.2 | 541.4 | 16.6 | 381760.2 | 481.2                  | 21.0 | 1206.7         | 479977.9 |
| Jun-17                      | 74218.8  | 10877.9 | 5993.9 | 482.2 | 592.0 | 19.0 | 357055.2 | 391.5                  | 18.7 | 1080.0         | 450729.3 |
| Jul-17                      | 123375.8 | 16294.5 | 8062.8 | 564.7 | 829.4 | 23.9 | 337962.4 | 416.2                  | 21.5 | 1499.9         | 489051.1 |
| Aug-17                      | 88512.2  | 12156.2 | 6990.6 | 562.1 | 905.2 | 22.0 | 301650.5 | 431.4                  | 22.3 | 1443.8         | 412696.1 |
| Sep-17                      | 90170.5  | 12410.8 | 6745.9 | 585.6 | 692.4 | 27.7 | 316723.7 | 450.8                  | 25.3 | 1940.7         | 429773.3 |
| Oct-17                      | 92812.6  | 12694.2 | 6409.9 | 596.5 | 708.6 | 30.7 | 313277.0 | 468.2                  | 24.1 | 1584.7         | 428606.6 |
| Nov-17                      | 87149.3  | 12011.6 | 6342.5 | 604.8 | 771.7 | 33.8 | 302097.8 | 439.3                  | 25.1 | 1019.2         | 410495.1 |
| Dec-17                      | 89163.4  | 12500.4 | 6224.3 | 651.5 | 752.4 | 41.3 | 294239.4 | 457.1                  | 27.2 | 1033.0         | 405090.0 |
| Jan-18                      | 102348.1 | 14182.1 | 6271.5 | 717.6 | 628.4 | 52.9 | 323578.5 | 478.2                  | 27.6 | 1121.6         | 449406.6 |
| Feb-18                      | 92056.1  | 13851.3 | 6340.2 | 750.4 | 900.5 | 70.3 | 299071.8 | 530.5                  | 32.7 | 1168.7         | 414772.5 |
| Mar-18                      | 98410.5  | 13884.0 | 6629.2 | 782.6 | 851.2 | 96.4 | 287357.8 | 479.8                  | 31.4 | 532.7          | 409055.7 |

Source: NPCI National Payment Corporation of India

**Analysis and Results**

Table 1 represents the data of monthly UPI transactions (Value in Billions) as a whole from last one year and it is analyzed from the above table even UPI transactions are less in value compared to the other payment systems it has incremental rate of change month by month. From last four months has changed drastically with the value from 41.3 to 96.4(in

**Objectives of the Study**

1. To analyze the growth and trend of UPI transactions
2. To forecast the future value of UPI transaction.
3. To compare the UPI system with other payment systems.

**Research Methodology**

**Sampling design:** The sample consists of 40 UPI system related apps which are offered by different banks and some other giant organization like Google.

**Tools for data collection:** present study purely based on secondary data which is collected from NPCI (National Payment Corporation of India) and RBI (Reserve Bank of India) and From various books and articles published in various journals and magazines.

**Statistical tools for Data Analysis:** For analysis tend line by moving average method, regression analysis, descriptive statistics and line graphs, Bar graphs are used.

Billions). Fig.No1 is the bar chart of UPI transactions month wise which shows incremental pattern. Trend line by moving average method taken period as 2 two observe trend and to forecast future trend of UPI transactions. From the moving average method it is forecasted that Value of UPI transaction is 83.35 but it seems to be more than previous months as there is drastic incremental change in last four months.

Fig. No1- Moving Average trend line of UPI for last one year

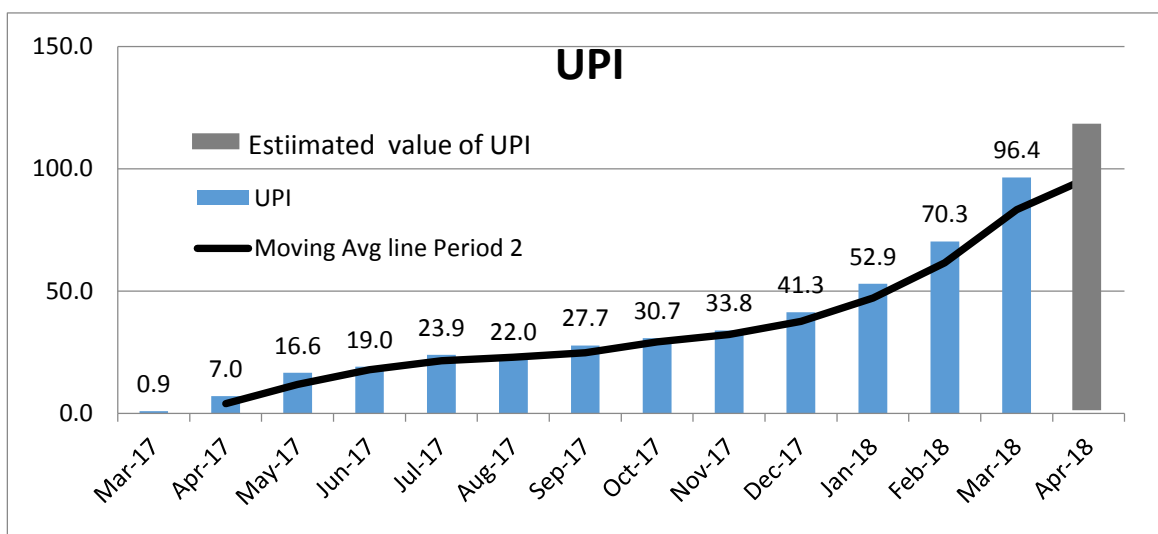


Table 2 represents the descriptive statistics of data related to UPI from Past one year starting from Mar-17 to Mar-18. Mean is 34.0344 billion which indicate there is more rapid growth as its initial value only 0.9 billion this is because of people have done more UPI transactions last six months. Standard deviation is also 26.25 from its mean as there is lot of incremental effect in UPI transaction and total UPI transactional value last one year is 442.44 billion which shows equal value with other payment mediums Viz., PPI (Payment Protection Insurance). Range is 95.5 Billion indicates more incremental change from last lone year.

Table3 Simple linear regression analysis

| Regression Statistics |             |
|-----------------------|-------------|
| Multiple R            | 0.921005665 |
| R Square              | 0.848251436 |
| Adjusted R Square     | 0.834456112 |
| Standard Error        | 10.68187057 |
| Observations          | 13          |

Table3 represents the regression analysis between UPI which is considered as

dependant variable and No of Month (Time) as independent variable and it is observed that from the results Multiple R is 0.921 which means strong positive correlation as it is closed to +1. Standard Error is very low means more values of UPI are lied on regression line. Significance F value is very low means results are accurate enough. And from the table we can form the regression line as  $Y (UPI) = 9.42 + 6.2X$  (No of Month) from this equation we can forecast future UPI values as 96.22, 102.42 for the months Apr-18, May-18 respectively.

Table4 represents no of transactions have been made for payment systems Viz., RTGS, NEFT, CTS, IMPS, NACH, and UPI et.al., and Fig No-2 represents line charts of these payment systems. From this chart it can be observed that UPI system has drastic incremental change from last four months even it is very down in that graph compares to other payment systems, and for last four months this incremental change in UPI affected other payment systems Viz., mobile banking and Debit cards and credit cards, USSD et.al.,

Table4 Volume of different electronic payment systems (Updated as on December 5, 2017)

| Electronic Payment Systems - Representative Data (Updated as on December 5, 2017) |      |       |       |      |       |     |       |                        |      |                |        |
|---|------|-------|-------|------|-------|-----|-------|------------------------|------|----------------|--------|
| Volume in million   |      |       |       |      |       |     |       |                        |      |                |        |
| Data for the period   | RTGS | NEFT  | CTS   | IMPS | NACH  | UPI | USSD  | Debit and Credit Cards | PPI  | Mobile Banking | Total  |
| Mar-17  | 7.9  | 123.0 | 87.1  | 36.2 | 152.5 | 0.3 | 7.0   | 205.5                  | 59.0 | 72.3           | 750.9  |
| Apr-17  | 8.8  | 166.3 | 130.0 | 52.8 | 198.7 | 2.0 | 102.2 | 311.0                  | 87.8 | 70.2           | 1129.8 |
| May-17  | 9.3  | 164.2 | 118.5 | 62.4 | 158.7 | 4.2 | 314.3 | 265.5                  | 87.3 | 64.9           | 1249.2 |

|        |      |       |       |      |       |       |       |       |      |       |        |
|--------|------|-------|-------|------|-------|-------|-------|-------|------|-------|--------|
| Jun-17 | 9.1  | 148.2 | 100.4 | 59.7 | 150.5 | 4.2   | 224.8 | 212.3 | 78.4 | 56.2  | 1043.7 |
| Jul-17 | 12.5 | 186.7 | 119.2 | 67.4 | 182.1 | 6.2   | 211.2 | 229.7 | 90.0 | 60.8  | 1165.8 |
| Aug-17 | 9.5  | 143.2 | 95.3  | 65.1 | 212.6 | 6.9   | 188.9 | 231.1 | 89.2 | 61.0  | 1102.8 |
| Sep-17 | 10.4 | 155.8 | 97.1  | 66.7 | 194.4 | 9.2   | 192.6 | 233.4 | 91.3 | 64.9  | 1115.8 |
| Oct-17 | 9.8  | 152.3 | 91.9  | 65.8 | 197.3 | 10.2  | 198.9 | 232.4 | 84.7 | 77.1  | 1120.4 |
| Nov-17 | 9.4  | 148.1 | 92.2  | 69.1 | 204.3 | 11.4  | 190.7 | 237.6 | 88.7 | 69.5  | 1121.1 |
| Dec-17 | 9.5  | 151.6 | 92.1  | 75.7 | 205.2 | 16.6  | 191.8 | 243.0 | 89.7 | 70.8  | 1145.8 |
| Jan-18 | 9.6  | 157.7 | 92.2  | 82.9 | 176.0 | 30.8  | 202.7 | 240.3 | 87.5 | 86.3  | 1165.8 |
| Feb-18 | 10.0 | 158.8 | 94.4  | 88.1 | 187.0 | 76.8  | 184.6 | 255.7 | 96.2 | 130.9 | 1282.6 |
| Mar-18 | 10.8 | 162.0 | 96.3  | 89.5 | 194.6 | 104.8 | 182.4 | 241.8 | 91.2 | 50.9  | 1224.4 |

Source: NPCI National Payment Corporation of India

## Conclusions

A financial system in any country can be in prosperous conditions when it goes with certain aspects Viz., Financial Inclusion, Financial Literacy and Digital Empowerment. For this there should be taken different kind of initiative from the government to achieve above said goals. UPI is one of the best initiatives by the RBI which leads to digital empowerment as it is very easy so people are more likely to use UPI to do money transactions and even people with low financial literacy people are most interest to use UPI related apps as it is simple to use unlike the other payment systems. And it is forecasted that even it is more incremental growth in future. But it can't replace all the payment systems like Credit card as it has credit facility for the customers.

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