

Technical Report 2018

BHIM UPI and BharatQR

Ashish Das

Department of Mathematics
Indian Institute of Technology Bombay
Mumbai-400076, India

January 2018



Indian Institute of Technology Bombay
Powai, Mumbai-400 076, India





***BHIM* UPI and BharatQR¹**

Ashish Das²

Department of Mathematics, Indian Institute of Technology Bombay, Mumbai-400076

January 5, 2018

UPI and *BHIM*

1. Created by National Payments Corporation of India (NPCI), the UPI (Unified Payments Interface) in its present *avatar* is an excellent innovation for 24x7 digital payments. The UPI platform has already enabled all major banks, through their respective UPI-Apps, to make digital payments using mobile phones. The simplicity in operating these Apps is akin to those of pre-paid m-Wallet Apps. Unlike m-Wallet Apps that operate through pre-paid mobile wallets, the UPI-Apps provide a secure interoperable unified fund transfer facility between two bank accounts on users' mobile phones. UPI provides ease to person-to-person as well as person-to-merchant transactions. In addition to the standard push feature (payer initiated) to make payments, UPI has also incorporated the pull feature (payee initiated payment like credit and debit cards), making it attractive for merchant transactions. It not only has the potential to replace paper based (cash/cheques) transactions but also the National Electronic Funds Transfer (NEFT) and debit cards at POS/e-commerce. NEFT is a near real time account to account transfer of funds that is operational during the day.

2. In the development of the UPI product, the architecture envisaged a bank to provide the front-end UPI-App and required all communications to be necessarily routed through the bank whose UPI-App has been installed by a customer. The business model of such a design was similar to that of ATMs. Whenever UPI-App of bank X is used by a customer of bank Y, bank X gets a commission from bank Y for serving its customer. The UPI structure necessitated a bank to identify itself with its UPI-App and its App-user routes transactions through this bank even if he is not banking with it but instead banking with a different bank. This increases complexities and

¹ The views expressed are those of the author and not necessarily of the institution to which he belongs.

² Dr. Ashish Das is a Professor of Statistics with the Indian Institute of Technology Bombay. E-mail: ashish@math.iitb.ac.in



possible frictions in form of multiple ‘hops’. With many banks on the UPI platform, we initially saw various bank specific UPI-Apps with different names (like Kotak’s *kaypay*, Canara’s *eMpower*, SBI’s *SBIpay*, HSBC’s *SimplePay*, BoB’s *Baroda MPAY*, Axis Bank’s *AXIS PAY*, etc.), front-ends and features.

3. After being persuaded by the Government and, more importantly, because of the catalytic effect demonetisation had on digital payments, NPCI promptly brought out its own UPI-App *BHIM* (Bharat Interface for Money) for direct use by bank customers. *BHIM* was dedicated to the nation by the country’s Prime Minister at its launch on December 30, 2016. Through *BHIM*, NPCI acts as a switch to communicate messages directly between the payer and the payee. At the backend, under the UPI platform, NPCI communicates between the two banks for the financial leg of transactions.

4. With centrality of operations at NPCI, the primary advantage is that *BHIM* (i) provides a uniform look and feel of the UPI-App; (ii) reduces one to two layers of bank involvement in transactions where the UPI-App provider bank is neither the payer nor payee bank; (iii) increases efficiency; (iv) brings flexibility to its features; and (v) increases the ease to innovate and improve.

5. Initially with *BHIM* transactions surging (Table 1 and Chart 1), we saw UPI transactions also picking up (Table 2 and Chart 2). Thereafter since September 2017 we see a surge in the UPI transactions. The reasons for this surge are twofold. First, in mid-2017, banks prefixed the brand name *BHIM* of their respective UPI-Apps. Thus, Kotak’s *kaypay* became *BHIM kotakpay*; Canara’s *eMpower* became *BHIM Canara eMpower*; SBI’s *SBIpay* became *BHIM SBI Pay*; BoB’s *Baroda MPAY* became *BHIM Baroda Pay*; Axis Bank’s *AXIS PAY* became *BHIM AXIS PAY*; etc. The brand *BHIM* helped the banks promoted their UPI-Apps. *BHIM* contributed significantly in enabling digital payments and creating an ecosystem that has helped mobile based digital transactions in India. Second, in September, 2017 newbie such as [Google Tez](#) and veterans [MobiKwik](#), Paytm and PhonePe seem to have been very aggressive with their cash back schemes.



6. In terms of growth, unlike UPI-Apps of banks (which we call non-BHIM UPI), BHIM had been throughout robust and stable. This gets clear when one compares the ticket sizes for BHIM and non-BHIM UPI starting September 2017 (see Table 3 and Chart 3 for non-BHIM UPI transactions). There had be a drastic decrease in ticket sizes for non-BHIM UPI due to dummy transactions carried out just to earn cash backs.

Table 1 : BHIM

Month	No. of Banks live on BHIM	Volume (Million)	Value (Rs Billion)	Average per TXN size (Rs)	% m-o-m growth for Volume and Value	
Jan-17	35	1.7	3.6	2075		
Feb-17	44	2.0	6.2	3163	15	75
Mar-17	44	2.5	8.2	3346	25	32
Apr-17	44	3.2	10.0	3144	30	22
May-17	44	4.0	13.1	3287	25	30
Jun-17	49	4.6	14.9	3220	16	14
Jul-17	52	5.4	16.0	2945	18	8
Aug-17	55	6.8	19.0	2789	25	19
Sep-17	55	7.6	22.5	2953	12	18
Oct-17	59	7.6	23.5	3077	0	5
Nov-17	60	8.2	25.5	3112	7	9
Dec-17	65	9.1	30.8	3401	11	21

Source: NPCI

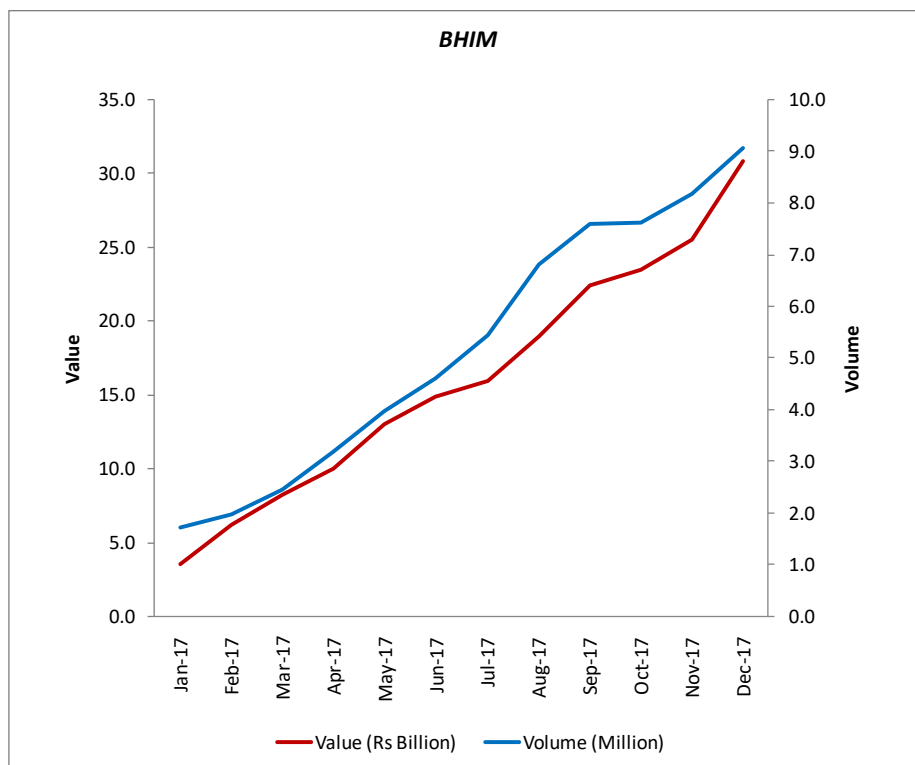


Chart 1



Table 2 : UPI

Month	No. of Banks live on UPI	Volume (Million)	Value (Rs Billion)	Average per TXN size (Rs)	% m-o-m growth for Volume and Value	
Jan-17	36	4.2	16.6	3994		
Feb-17	44	4.2	19.0	4577	0	15
Mar-17	44	6.2	23.9	3882	48	26
Apr-17	48	7.0	22.4	3199	14	-6
May-17	49	9.2	27.7	3016	31	23
Jun-17	52	10.2	30.7	3020	11	11
Jul-17	53	11.4	33.8	2955	13	10
Aug-17	55	16.6	41.3	2485	45	22
Sep-17	57	30.8	52.9	1720	85	28
Oct-17	60	76.8	70.6	919	149	33
Nov-17	61	104.8	96.4	920	37	37
Dec-17	67	145.5	131.4	904	39	36

Source: NPCI

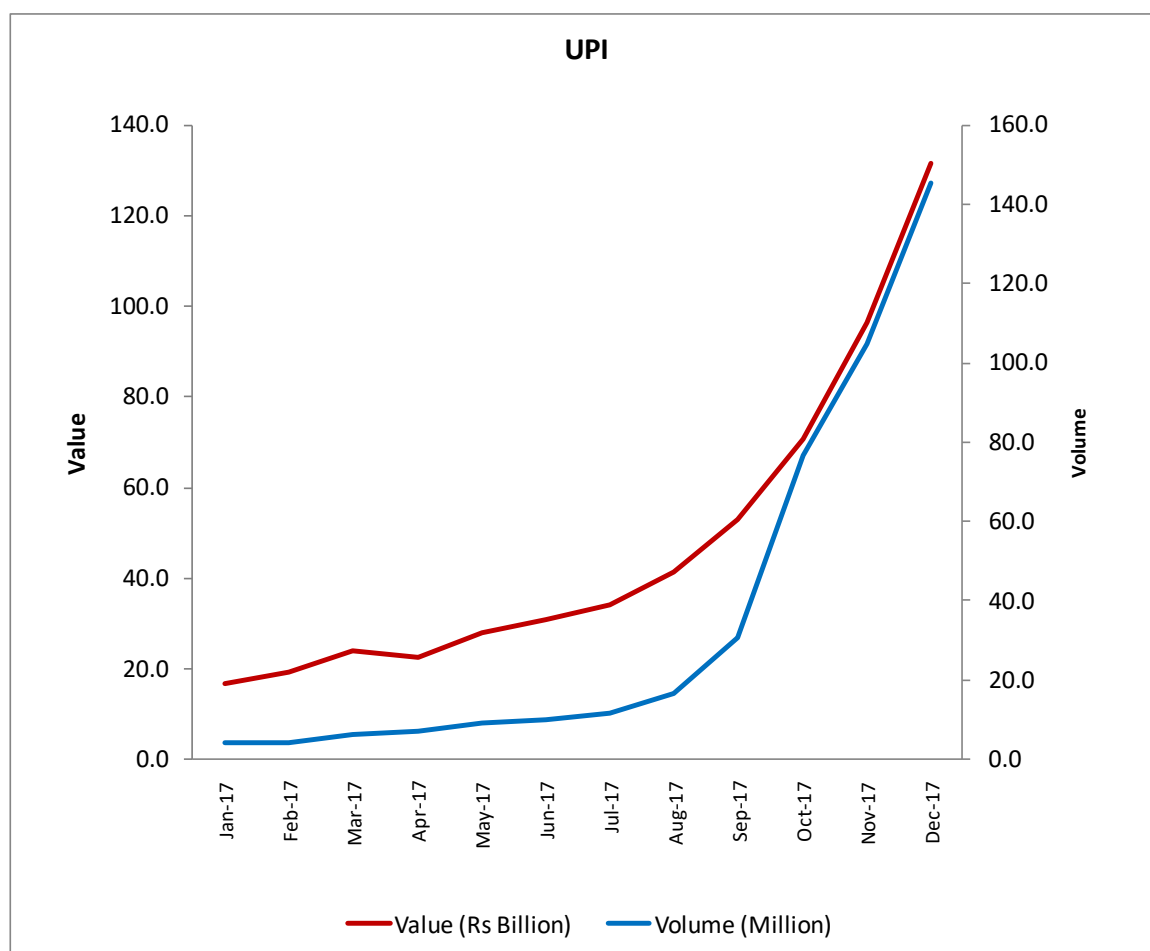


Chart 2



Table 1 : Non-BHIM UPI

Month	No. of Banks on UPI but not BHIM	Volume (Million)	Value (Rs Billion)	Average per TXN size (Rs)	% m-o-m growth for Volume and Value	
Jan-17	1	2.4	13.0	5348		
Feb-17	0	2.2	12.8	5851	-10	-2
Mar-17	0	3.7	15.7	4238	69	23
Apr-17	4	3.8	12.4	3244	3	-21
May-17	5	5.2	14.6	2809	36	18
Jun-17	3	5.5	15.8	2854	7	8
Jul-17	1	6.0	17.8	2963	9	13
Aug-17	0	9.8	22.3	2274	63	25
Sep-17	2	23.2	30.5	1315	136	37
Oct-17	1	69.1	47.1	681	198	54
Nov-17	1	96.7	70.9	734	40	51
Dec-17	2	136.4	100.6	738	41	42

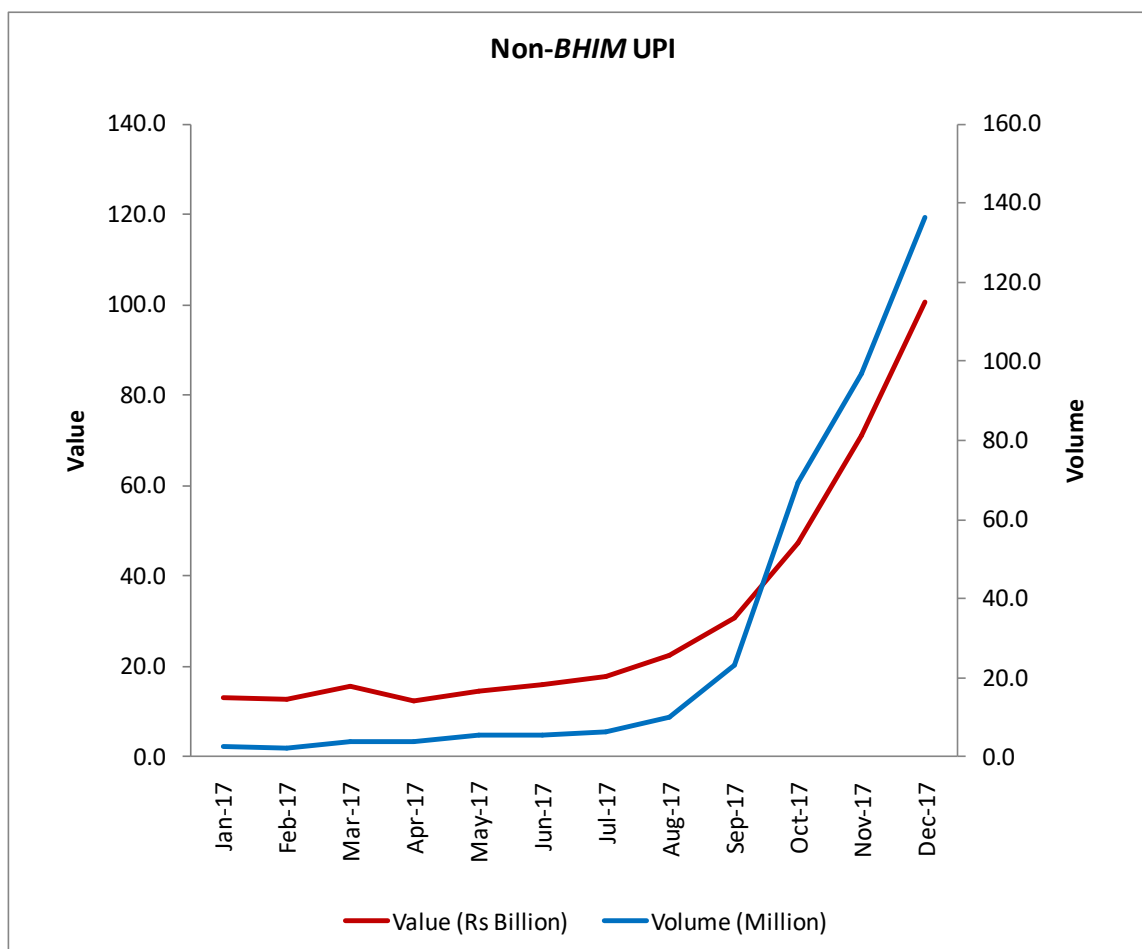


Chart 3



7. A major issue that needs to be resolved is the identification of a balanced fee/revenue model for such a futuristic digital payment platform. With an explicit revenue model for banks (independent of their earlier investments made in various cashless/paperless payment initiatives), it is important that whatever is proposed in this direction has clear considerations of the operational expenses in using cash as a payment mode – not only for banks but for the Government and for the economy in general. Moreover, if *BHIM* cannot ensure a cheap solution, the product itself would not be attractive for the common man in India. While the need and convenience to go digital is now being felt by most of the consumers and businesses, including those in the unorganised sector, time is absolutely opportune to think of business strategies that provide long-term solutions.

BharatQR

8. After the launch of digital payment systems like UPI and *BHIM*, a new retail payment method, has been launched using QR or Quick Response code. BharatQR is the latest initiative to boost retail digital transactions. BharatQR is a smart way for making payments across merchant outlets and aims at enabling seamless payment for buyers by using ‘scan to pay’ method, instead of swiping their debit or credit cards at POS machines.

9. QR code is a small square shaped printed code which is made up of grids of several tiny black squares. They store the required information and trigger the required process when these are scanned by the camera in a smartphone.

10. BharatQR developed by joint efforts of NPCI, MasterCard, Visa and American Express has great potential in the retail digital payment space. The interoperability of the BharatQR ensures that a customer having a bank account in any bank will be able to pay directly the merchant who may have his account in any other bank. The merchant will only need to display a single QR code instead of having multiple QR codes of different payment partners corresponding to Credit cards, Debit cards or UPI platforms.



11. A customer is required to use *BHIM* or a banking App with BharatQR functionality. At the physical merchant establishment or eCom site, the customer will only need to open the App and scan the merchant's BharatQR. He will then enter the amount (if not already embedded in the BharatQR) and authenticate the transaction. The amount is instantly transferred from customer's account to the merchant's bank account. Both the merchant and the customers will receive instant notification of the payment. BharatQR will eliminate the need of having a separate POS card-swiping machine at the merchant outlet.

12. As UPI, *BHIM* and BharatQR picks up, the usage is expected to post healthy growth in future as well.