

Sentiment Analysis of Digital Wallets and UPI Systems in India Post Demonetization Using IBM Watson

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Abstract: The digital payment landscape is sprouting in the country at a dizzying step. After the demonetization, complete turnaround in the payment landscape has been observed. The technology revolution and government initiative of cashless economy, followed by demonetization saga has enabled the evolution of multiple non-banking players in the payment space. While these e-wallets have made substantial grounds in the Indian economy system, it becomes eminent to analyze the customers' perception towards these e-wallets. In this paper authors attempt to analyze the sentiments of digital wallet users in India over different payment applications. The authors analyses sentiments by using the IBM Watson software tools in various social networks by taking different payment system into consideration. The authors analyzed the documents, forums, tweets and other sources where the users shared their feedback for the wallets from 8th November 2016 to 7th November 2017. This study brings various interesting insights about India's readiness to adopt change for digital payment options and sentiments of the users for the same.

Keyword(s): Digital wallet, India, Watson Analytics, Demonetization, PayTM, BHIM, UPI

I. INTRODUCTION

Digitalization in India came into full force when the government started an initiative known as a Digital India on July 2, 2015. The primary aim of this initiative was to ensure that all the government services are made available to all the citizens electronically. It has played a very vital and substantial role in Indian economy. The concept of digital India comprises of enhancing the online infrastructure and increasing the internet connectivity to make the country digitally empowered in the field of technology. With this, different mobile payments system or digital wallets came into existence for the digital transactions. Many wallets and UPI systems got a great expansion after the digital India campaign like Paytm, Bhim etc. By these digital wallets, user can make a purchase quickly and easily with the help of communication technology. And now mobile payments system has emerged into the extent that has created a great impact on our daily

lives. Innovative features, adventurous and new services are influencing the customer's sentiments.

Since the beginning of this century, the evolution of various technologies have made the mobile devices not only a communication device but also one of the prime sources of digital payments [1]. The digital payments are one of the bridges to bring about digital movement in the country. But this evolution would take sincere efforts since there are many factors which pose challenges to this adoption of digital payment systems. The use of internet, security issues and ease of use are some of the primary reasons why the users remain skeptical about the use of digital payment system [2].

As stated by Joshi [3], various modes of digital payment systems like UPI, IMPS etc. have found remarkable patronage in last two financial years i.e. 2015-16 and 2016-17 in India. This study showed that the initiatives taken by the government of India has resulted in positive way. But the main reason for the digital payments during the last year has been the Demonetization done by the government of India on 8th November 2016. During this demonetization, 1000 and 500 rupees notes ceased to be legal tender anymore. For a country where these notes formed 86% of the whole economy, it was a big step and the public had to think of alternatives till the new currencies came into the public domain.

During this phase, the digital payment methods found huge patronage. According to Chaudhari [4], even though these payment systems needed some improvements, they found acceptance among the Indian citizens. Bhuvaneshwari and Sivakavitha [5] did a research which showed that the urban population of Chennai city adopted the digital payment system at a rapid pace. Even districts like Trichy and Thanjavur in Tamil Nadu state accepted the digital wallets mode of payment at a rapid pace [6].

Even though one of the primary reasons for this fast adoption of digital wallets and UPIs in India was demonetization, the citizens are now accepting these modes as their primary

methods of payment. Gupta [7] points out that the people are now realizing the benefits of cashless transactions. Along with the benefits, other services that these methods provide to the consumer plays a vital role in the acceptance of the digital methods in India.

Since the country is adopting to the cashless transaction methods at a very rapid pace, this study has been aimed to analyze the sentiments of the people towards these various payment systems. The success of any enterprise depends on their consumers' reactions and therefore we have tried to analyze which payment companies have been successful in providing them efficient services.

II. METHODOLOGY

This research work uses IBM Watson analytics for social media. IBM Watson is based on cognitive computing and helps the users to synthesize multiple unstructured interpretations and analyze them intelligently [8]. IBM Watson combines various capabilities for the cognitive computing which include natural language processing, hypothesis generation and evaluation and dynamic learning. In this research work, IBM Watson collected the data which mentioned the given eight digital wallets and UPI systems. These data ranged from 8th November 2016 to 7th November 2017. Seven primary sources were considered for the collection of the data which included Twitter, Forums, Reviews, Facebook Pages, Videos, Blogs and News.

For this research work, the authors have analyzed the digital presence of eight wallets in India post demonetization. The authors have also analyzed the sentiments regarding the mentions of the wallet in the cyber world. The wallets that have been analyzed in this study are as follows:

Oxygen

Oxygen wallet is the India's first non-banking payment solution provider which was started in 2003 and is approved by RBI. Oxygen wallet is a unit of Oxygen Services India Pvt. Ltd. started by Mr. Pramod Saxena and endorsed by Sachin Tendulkar. Services of Oxygen are integrated starting from the instant recharges to the payment of bills and to the money transfer to the tickets bookin. It strives to bring customer convenience services which customer can easily use in mobile or in desktop. According to the survey which was conducted in 2016, by VC Circle, this app has 20 million users which is accepted by approximately 9000 merchants within 10000 online sites. It is the first online wallet which allowed customer to load cash in their mobile wallet.

The positive and the main feature of this application is that it accredits the individuals to transfer money even if the user doesn't have a bank account. Oxygen Services India Pvt. Ltd. has tied up with different brands and with different verticals like in travel it has collaborated with Red bus, Rajasthan State Road Transport Corporation, Oyo rooms and Make my trips. In entertainment, it has link up with Book my show PVR cinemas similarly it is associated with ecommerce and food and beverages industry too.

MobiKwik

Like other digital wallets, MobiKwik provides mobile phone based payment system and a digital wallet, was founded in 2009 and from the day it was launched till now it has significant footsteps in the Indian market and is growing in a rapid way. It is also a RBI certified wallet and claims that they have built their own technology using multilayers of security and fraud prevention codes. User can use this application in any device or in any operating system. Each and every single penny customer added in his MobiKwik account is safe in his wallet for the future transactions.

Even in 2016, taking the users of older 2G mobile networks in concern, MobiKwik launched MobiKwik Lite mobile app for those areas with poor internet connectivity so that everyone can take the advantage of the application and can have safe transactions.

PayTM

It is Noida based largest Indian Ecommerce website which was launched in 2010 and adds to the industry of Fintech in India. It was founded by the Vijay Sekhar Sharma. Initially Paytm started with online mobile recharge and bill payments and recently, it has become an India's largest mobile payment gateway for all the ecommerce platform.

Paytm has over 20 million registered users as per their current study and analysis of data. Its fully approachable websites and application has altered into a fully-fledged e-commerce market place offering various categories in every segment starting from electronics, mobile phones, sports and health, home and kitchen, books to baby and toys. Paytm is one of those companies which have expanded in a relatively short period of time. They have evolved from payment gateway into e-commerce and then to a digital wallet. The demonetization has affected Paytm to a great extent which are elaborated as follows:

1. It has been found that transaction of Rs. 120 crores a day and 7 million transactions every day.
2. The Gross Merchandise Value (GSV) for Paytm was \$3 billion in 2015 and now it is \$5 billion. And also it is

expected that Paytm is looking at expanding and adding up to 1,50,000 merchants.

FreeCharge

Freecharge is an ecommerce website which is headquartered in Mumbai, Maharashtra. It is basically an online recharge website which provides online provision to recharge any prepaid mobile phone, postpaid mobile phone, DTH Data cards etc. for the quick payments. FreeCharge was founded in 2010 and acquired by the Snap deal which is itself a large ecommerce platform, which was being referred as a second biggest takeover in the Indian ecommerce sector so far.

Recently in July 2017, Axis bank acquired FreeCharge which it believes that company will extract value from FreeCharge transaction. FreeCharge has been performing excellently on data and transaction integrity, access, availability and authentication, as it is not linked to any particular specified vendor. Its main feature is that it has an attribute of “data lifeline” that helps prepaid customers whenever they run out of their data packs. This features is for the ease of the customer and so that customer can stay connected with the application.

PhonePe from Flipkart

One of the most prominent ecommerce websites in India, Flipkart own the digital wallet PhonePe since April 2016, after it was launched 2015. In 2016, PhonePe also affiliated itself with YES Bank and they have been introducing new features together. PhonePe uses the encrypted software from National Payments Corporation of India to enable the user to connect his/her bank account to the mobile.

Based on the government backed Unified Payment Interface (UPI) platform, PhonePe offers seamless digital transaction experience. The usage of PhonePe has seen a massive growth post demonetization since the clients have preferred to stick to cashless payment due to scarcity of cash flows. However, in January 2017, the ICICI bank had blocked PhonePe transactions since it did not follow the NPCI’s guidelines. This fact was then confirmed by NPCI after which PhonePe had to shut down all of its operations on Flipkart to stick the rules prescribed by NPCI. Recently, PhonePe CEO Sameer Nigam has stated that the company aims to double the number of transactions every two months.

Jio Money

Jio money is a digital wallet and a mode of easy payment transaction which was launched by reliance Jio infocomm in 2016 which helps user to make instant payments like payment of utility bills like electricity, water etc., recharging of DTH connections or mobile, transferring money to the bank account or to the friend or family or we can say just for everything.

Jio mobile payment app provides the safe and secure payments on both physical and online stores. Even user can link their bank accounts a different card with this Jio money app and can schedule monthly payments like rent and water and gas and all the bills accordingly, which is a special feature one can utilize positively. Jio money comprises of very smart technology which includes the advanced features like setting standing instructions for payments, checking and availing varieties of discounts coupons and offers. User can also view the list of available mobile providers and billers listed in the app for the ease. Currently Jio has tied up with Tata sky, Airtel and Dish Tv.

BHIM (Bharat Interface for Money)

Developed by National Payments Corporation of India (NPCI), BHIM (Bharat Interface for Money) is a mobile which is based on the Unified Payment Interface (UPI) . This app was launched by the Prime Minister of India, Mr. Narendra Modi on 30 November 2016 at Talkatora stadium, New Delhi in Digi Dhan Mela. This app has been designed keeping in mind that the users would just need a valid mobile number. A BHIM user can also make its own VPA besides the phone number. This app is different from the popular digital wallets in the sense that it works only as a transfer mechanism, transferring money from different bank accounts and allowing the user to check their current balance in their respective accounts.

BHIM allows the users to sign up with more than one account to enable them to conduct the transactions, however, only one transaction can be done at a given time. This app is available in 9 languages which includes the regional languages as well.

Amazon Pay

It is an online payment service provided by amazon to its users. It is available in India as well as in other countries like U.S, France, Germany etc. In India people are fonder of using cash rather than paying online so after demonetization it has adversely impacted the e-commerce sector as people have no cash just after demonetization. So to reduce this impact Amazon introduced its own digital wallet Amazon pay to promote digital payments and to increase its business.

Amazon pay also enables faster refunds, as now customers receive their refunds in amazon pay wallet not in their bank

account. It will also eliminate the need for sharing the important credit details of a customer.

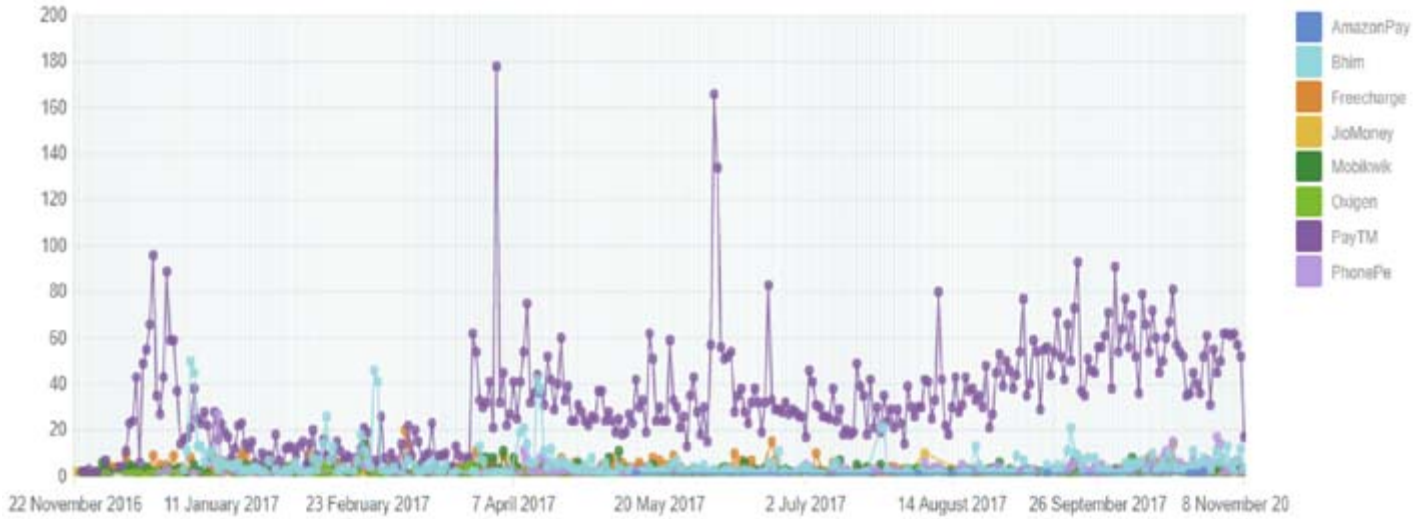


Figure 1 Number of mentions of different payment methods (in thousands)

III. RESULTS AND DISCUSSION

For the analysis of the sentiments and other factors, the data was collected from eight different sources where consumers shared their sentiments towards the wallets and UPI systems from 8th November 2016 to 7th November 2017. The first analysis that the authors did was the number of mentions these payment systems obtained during this period. As it is quite evident from figure 1, the number of mentions of PayTM superseded any other wallet with a huge difference. Post demonetization PayTM has been able to tap into the highest number of consumers and that is the reason behind the popularity of PayTM. While PayTM got the highest number of mentions, the second spot was obtained by BHIM, the UPI system developed by National Payments Corporation of India. Mobikwik and Oxigen also got reasonable mentions among the consumers which can be seen from figure 1.

When the authors analyzed the sex ratio in the participation of the mentions, it was concluded that AmazonPay has an equal participation of male and female users. However, this 50:50 ratio participation may also be because the number of mentions of AmazonPay has been much lesser as compared to other payment systems. The next participation ratio was obtained by MobiKwik which had 77% male users and 23% female users. The lowest participation ratio was obtained by JioMoney which had 87% male and 13% female participation as illustrated in figure 2.

While the mentions of the payment systems were from all over the country, the authors analyzed the states from where these payment systems got the maximum coverage. As it can be seen from figure 3, the maximum mentions about these payment systems were from Maharashtra, followed by West Bengal, Karnataka, Delhi, Haryana and Tamil Nadu. Maharashtra, being the financial and commercial capital of India, got the maximum mentions also because the stock market is also based in Mumbai.

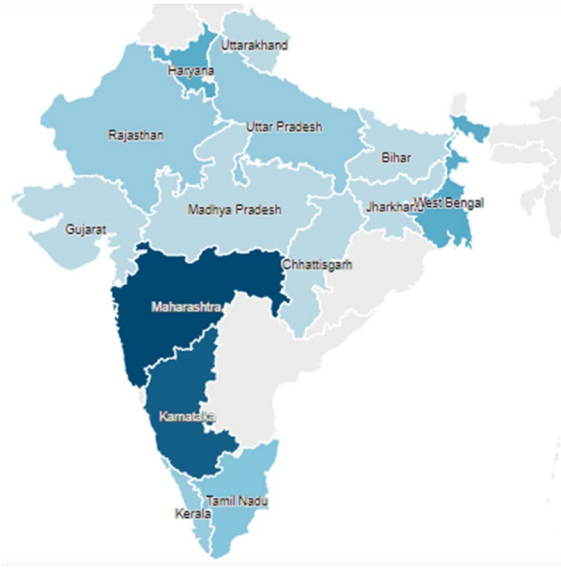


Figure 2 State wise classification of mentions of digital payment methods in India

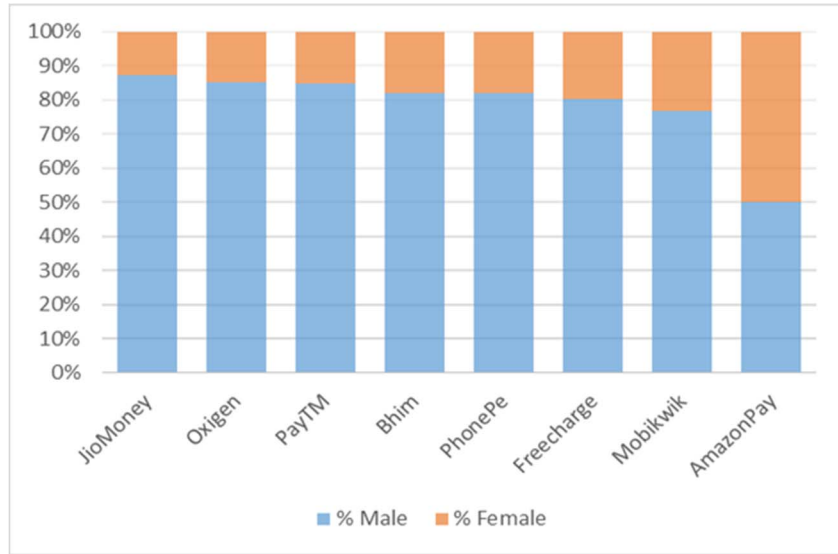


Figure 3 Gender wise classification of mentions of the digital payment systems in India

When the sentiments towards these payment systems were analyzed, it was observed that the best experience was provided by BHIM payment system. BHIM was closely followed by AmazonPay while Freecharge obtained third spot. In terms of most negative sentiments, JioMoney came on top, followed by MobiKwik. The most number of neutral mentions were done in the favor of PayTM while AmazonPay had the most number of mixed feelings (Ambivalent) mentions. Figure 4 summarizes the complete sentiment analysis of the mentions of the digital payment systems that are prevalent in

India. The results, on the whole, do seem to support BHIM, AmazonPay and PayTM as per the mentions by the users.

IV. CONCLUSION AND LIMITATIONS

In this research work, a post-demonetization analysis of the digital payment systems in India has been done. This study analyzed the consumers' sentiments towards the eight digital wallets and UPI systems and also analyzed which payment system found patronage amongst the citizens.

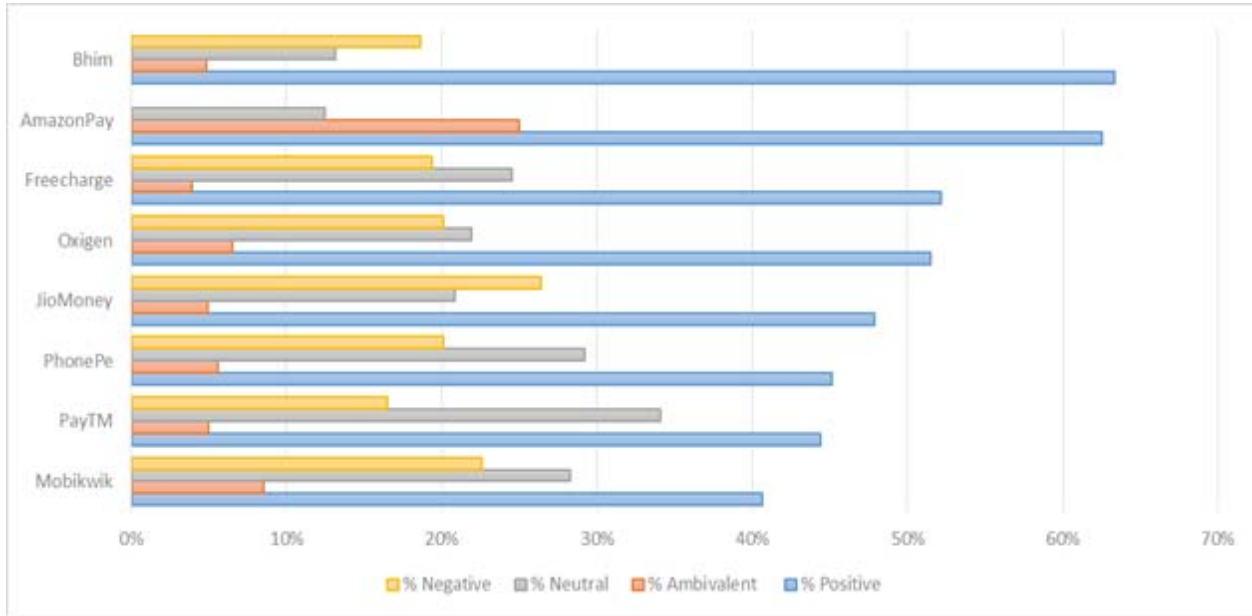


Figure 4 Sentiment Analysis of the mentions for digital payment methods in India

During this research work, it was found out that the UPI system launched by NPCI found highest number of positive mentions during one year of post demonetization period.

It was also found out that highest number of mentions were for PayTM, even though most of them ranged from positive to neutral sentiments. Highest number of mentions were found to be obtained from Maharashtra, followed by Delhi, West Bengal and Tamil Nadu.

Since this research work has been performed with the help of IBM Watson, it must be quoted that the data gathered from Twitter was 10% of total volume. However, there can be some change observed if this 10% data is increased to a bigger quantity. Also, these sentiments can definitely change from time to time, given the services offered by each companies improve in process.

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