

# An Empirical Study on Future of Mobile - Wallets in India : A Gateway for Cashless Payments

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## Abstract

After the demonetization in India by the Union Government on Nov 9, 2016, mobile-wallets (m-wallets), as pre-paid purchase instruments (PPI) would play a vital role to boost efforts towards cashless payments and financial inclusion in the Indian economy. All the bank account holders with debit cards and smart phones will be the most probable users of m-wallets post demonetization. Therefore, this research paper attempted to explore the future of m-wallets in India by accessing the intent of existing debit card users to use m-wallets for cashless payments. Extensive literature review and personal interviews of senior professionals from banking and telecom industries were conducted to find the parameters to explore usage intentions of m-wallets based on adaption readiness and perceived risk for m-wallets. A survey of 445 such customers, who used debit cards for cashless payments, was conducted in the city of Lucknow during December 2016, post demonetization. Questions were asked to test the awareness level for m-wallets and about their experience while using debit cards to understand their probable behavior for using m-wallets in India. By using discriminant analysis, a model was derived, which suggested that debit card users who were upto 45 years of age had fewer handling problems related to debit cards and were more inclined towards adopting m-wallets post demonetization in India. This information has vital implications for policy makers and service providers while strategizing for cashless payments. The post demonetization environment for cashless payment is conducive for m-wallets in India, opening ample business opportunities for service providers by providing secured and quality day to day cashless payment facility for customers in the future.

**Keywords:** cashless payments, debit cards, digitalization, financial-inclusion, insurance premium, m-wallet

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The M-wallet's market is a nascent market till now, which includes money transfers, services related to banking transactions, insurance premiums, value-added services such as shopping, ticketing, recharging, and bill payments, but now it is fast picking up and is estimated to grow considerably in the next 5 years. According to a study by research and consultancy firm RNCOS, the current Indian market size for m-wallet stands at about ₹ 350 crore and is estimated to rise to ₹ 1,210 crore by 2019. The segment is projected to grow at a compounded annual growth rate (CAGR) of around 30% in the next 5 years from 2015-2019. As per the report, growth will be driven by increase in demand for smartphones, which is estimated to grow at a higher pace with rising mobile internet users in rural areas, which has grown to 92% in 2013. Smartphone users can install m-wallet applications in handsets and can create their own login account. They get a permanent pin number for utilizing m-wallet services.

As per India's top mobile wallet app (2016), some of the major m-wallet players are Airtel Money, M-rupee, Vodafone M-paisa, Oxigen wallet, Paytm, Mobikwik, and Idea Money. There will be more players in this segment, giving tough competition and thereby a fall in the prices and better services are likely. Subsequently, in the second phase, micro-finance companies may use it as a payment tool to penetrate their business in remote

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areas as well, in order to provide rural customers an opportunity to have secured money transfer and premium payment mechanism for financial inclusion.

## **Literature Review**

Thakur and Srivastava (2014) tested the functional relationship between adoption readiness (AR), perceived risk (PR), and usage intention for mobile payments in India and investigated the stability of proposed structural relationships across different customer groups.

Chauhan (2015) explored the acceptance of mobile money by poor citizens of India. For a large section of the population in India, m-wallet can act as a way to achieve financial inclusion. However, for m-money to succeed, users should accept the initiative wholeheartedly and prefer it to debit cards, as debit cards have problems related to theft, misuse, validation, etc.

Vyas, Gaur, and Singh (2016) found that mobile banking has evolved in the last couple of years with the help of mobile penetration, which has shown phenomenal growth in rural areas of India. Bankers are adding value in services by developing smartphone apps, mobile wallets, and educating consumers about the benefits of using mobile banking, which is resulting in adoption of mobile banking faster among consumers as compared to debit card payments via net banking.

According to Zhong (2009), this technology has wide applications even in rural areas and there is a road ahead in China as well as it is more secure and faster than current debit card payments.

Chandra, Srivastava, and Theng (2010) said that market awareness and customer trust on the security of m-wallets along with quality of service would be the major requirements to succeed in India. According to Dai, Singh, and Iyer (2007), intentions of Chinese customers to adopt a variety of m-commerce services were based on a variety of individual characteristics and service quality. The results of this study may inform practitioners in developing focused segmentation strategies for Chinese consumers based on their intentions and preferences toward various m-commerce activities.

According to Lai and Chuah (2010), mobile payments had wide applications in retail payments primarily for supply where payments had to be quick and reliable and had quick and faster validation procedures to make small but urgent cashless payments ; whereas, debit card payments had many validations, mishandling, and theft-related issues. Therefore, debit card users were likely to switch to m - wallets payments for small day to day payments.

Kreyer, Pousttchi, and Turowski (2003) explored the scope of mobile payments based upon payment characteristics in different markets to specified customers for safe and secure day to day payments. Kim, Mirusmonov, and Lee (2010) in an empirical examination of factors influencing the intention to use mobile payments found that value-added features would be the key to attract customers to mobile based payments as compared to net banking or debit card payments. Russell (2015) described that India's top mobile wallet app adds support for payments to bank accounts leading to cashless payments.

## **Research Gap**

On the basis of the findings from the literature review, it is derived that no study is available in the Indian context to explore the future prospects of m - wallets in India for cashless payments. There are many challenges for m - wallets and their acceptability due to certain perceived risk as an alternate method of cashless payments. Personal interviews of persons responsible from banking and telecom industries were also done to understand the ongoing practices and challenges for m-wallets in India.

## Objectives of the Study

- (i) To study the current scenario, business trends in India and guidelines of Reserve Bank of India for m-wallets.
- (ii) To develop a model to predict customers' liking towards use of m-wallets on the basis of their perception while using debit cards for cashless payments.
- (iii) To understand m-wallets and their utility for domestic service providers for promotion of cashless payments to broaden their business and customer base.

## Mobile - Wallet : Technology, Current Scenario, and Reserve Bank of India's (RBI) Guidelines

**(1) Concept of Mobile Wallets & Technology :** Mobile wallets are a pre-paid purchase instrument (PPI) also referred to as mobile money, mobile money transfer for payment services operated under financial regulation and performed from or via a mobile device. As per Business detail for m - wallets (2016), the distinguishing features of m-wallets are money transfer businesses, recharge and bill payments and utilities, and online purchase to the maximum limit of ₹ 50,000. Mobile wallets use near-field communication (NFC) chips inside mobile smart phones and tablets to transmit payment information. When a customer is ready to pay using a mobile wallet, he/she opens an app on a smartphone or other device. The customer then enters a PIN and selects the payment account he/she wishes to use, along with any special offers or customer reward programs he/she wants to apply to. At the time of payment, they simply tap their device to an enabled payment terminal, and the payment information is transmitted.

**Table 1. Business Details of M-Wallets and Debit Cards**

| Month/           | Debit Cards      |                        | M-Wallet         |                        |
|------------------|------------------|------------------------|------------------|------------------------|
|                  | Volume (Million) | Value (Rupees Billion) | Volume (Million) | Value (Rupees Billion) |
| <b>2015-2016</b> |                  |                        |                  |                        |
| Apr              | 696.11           | 2,115.58               | 67.05            | 11.96                  |
| <b>2014-2015</b> |                  |                        |                  |                        |
| Mar              | 700.31           | 2,095.76               | 46.11            | 10.82                  |
| Feb              | 638.29           | 1,749.70               | 24.08            | 8.76                   |
| Jan              | 677.04           | 2,037.63               | 27.62            | 8.92                   |
| Dec              | 664.68           | 2,110.79               | 23.19            | 8.28                   |
| Nov              | 635.72           | 1,934.97               | 21.38            | 6.97                   |
| Oct              | 676.4            | 2,042.57               | 21.39            | 7.01                   |
| Sep              | 656.56           | 1,951.98               | 18.77            | 6.74                   |
| Aug              | 654.95           | 1,929.87               | 16.58            | 5.76                   |
| Jul              | 647.6            | 1,953.90               | 15.52            | 5.52                   |
| Jun              | 615.37           | 1,885.59               | 13.71            | 4.66                   |
| May              | 627.35           | 1,969.57               | 13.57            | 4.37                   |
| Apr              | 610.3            | 1,830.31               | 13.07            | 4.03                   |

Source: RBI database of Indian economy: Payment System Indicator, 2014-2015 and 2015-2016

**(2) Current Business Status of M - Wallets and Debit - Cards in India :** The Table 1 clearly shows that the business of m-wallets is increasing ; whereas, the same of debit cards is growing relatively at a slower pace. This is primarily due to the fact that the market of m-wallets in India is at an introductory stage and is moving towards the growth stage gradually.

**(3) RBI Guidelines :** As per Reserve Bank of India's (2009) guidelines for issuance and operation of m -wallets (2015), the pre-paid payment instruments that can be issued in the country are classified under three categories, that is, (i) closed system payment instruments, (ii) semi-closed system payment instruments, and (iii) open system payment instruments.

**(i) Closed System Payment Instruments :** These are payment instruments issued by a person for facilitating the purchase of goods and services. These instruments do not permit cash withdrawal or redemption. As these instruments do not facilitate payments and settlement for third party services, issue and operation of such instruments are not classified as payment systems.

**(ii) Semi - Closed System Payment Instruments :** These are payment instruments which can be used for purchase of goods and services, including financial services, at a group of clearly identified merchant locations/ establishments which have a specific contract with the issuer to accept the payment instruments. These instruments do not permit cash withdrawal or redemption by the holder.

**(iii) Open System Payment Instruments :** These are payment instruments which can be used for purchase of goods and services, including financial services like funds transfer at any card accepting merchant locations (point of sale terminals), and also permit cash withdrawal at ATMs. Banks which comply with the eligibility criteria would be permitted to issue all categories of pre-paid payment instruments. Non-banking financial companies (NBFCs) and other institutions or persons would be permitted to issue only closed and semi-closed system payment instruments, including mobile phone based pre-paid payment instruments.

**(4) Capital Requirements :** Banks and non-banking financial companies which comply with the capital adequacy requirements prescribed by Reserve Bank of India from time-to-time, shall be permitted to issue pre-paid payment instruments. All other persons, seeking authorization henceforth, shall have a minimum paid-up capital of ₹ 500 lakhs and minimum positive net worth of ₹ 100 lakhs at all the times.

## **Research Methodology**

**(1) Research Design :** Descriptive research design was used to describe the current situation on m - wallets on the basis of historical data available from RBI reports and available literature. Primary data was collected from customer survey and was further analyzed using analytical research design.

**(2) Data Sources :** Secondary data were collected from RBI reports upto 2015-2016. Primary data was collected through a well-structured questionnaire and customer survey.

**(3) Area of Study and Time Period of the Study :** The study was conducted in the city of Lucknow during December 2016, post demonetization.

**(4) Sample Unit :** Debit card (ATM) holders in the city of Lucknow because they might be the most convenient and probable users of m-wallets initially for the purpose of the study.

**(5) Sample Size Determination :** To select the representative sample, precision level and confidence intervals were determined to estimate the sample size. In this study, buying motives were measured on Likert scale of 1 to 5. For scores between 1 and 5, at 95% confidence level, the acceptable limit of error (precision level) was determined to be 0.20.

Therefore, standard deviation ( $\sigma$ ) should be less than or equal to range divided by 2.

$$\sigma \leq 5 - 1/2 = 2$$

The sample size was determined by  $N = (Z^2 * \sigma^2) / e^2$

$Z = 1.96$  at 95% confidence level.  $e = 0.20$ , hence  $N = (1.96^2 * 2^2) / (0.20)^2 = 384.16$

However, to ensure a higher degree of precision and accuracy, 445 responses through well-structured questionnaires were collected out of which 400 were complete and were found to be suitable for the study.

**(6) Instrument Development and Data Collection:** On the basis of the literature review and opinion of industry experts, variables considered for the study were customer's age, handling problems, fear of theft, fear of misuse, validation issues, and non-functionality of debit cards. A 5 - point Likert scale was used to collect the responses for buying motives. The questionnaire was validated by industry experts for content validity. Cronbach's Alpha value was found to be 0.84. This established the reliability of the instrument. A pilot study with 100 customers was done initially to validate the results and variables under the study. The results of the pilot were found appropriate for the variables under study. Thus, further study was conducted using the validated questionnaire, and 400 final responses were collected exhibiting consistent results.

## Analysis and Results

A survey was conducted in the city of Lucknow to collect the preferences of customers and their readiness to use m-wallets who were using debit cards for payment of utilities and fund transfers. Out of a total of 445 questionnaires received after the survey, 400 were found to be correct and suitable for the analysis. The survey was based upon a mix of stratified random sampling and convenience sampling in order to ensure an equal representation of different individuals from different demographic profiles and socioeconomic backgrounds. Customers were picked from different ATMs in the city of Lucknow randomly, and ATMs were selected from different locations of Lucknow as it was convenient. The Table 2 exhibits the detailed sample profile.

✎ **Discriminant Analysis :** It was conducted as following to understand two different customer groups of m - wallets. One group used m - wallets for cashless payments and other group did not use it due to lack of trust and security concerns of m - wallets. The group statistics is as depicted in the Table 3.

The Table 3 shows that there is a significant difference in means between the two groups with respect to all the six parameters (age, handling problems, fear of theft, fear of misuse, validating issues, and non-functionality). It indicates that it is worthwhile to proceed further with the discriminant analysis.

Tests of Equality of Group Means, as highlighted in the Table 4, provides strong statistical evidence of significant differences between means of m-wallet users and non-user groups for all six factors with fear of misuse of debit cards having a very high  $F$  - value. The Table 5 shows the test of equality of covariance matrices for further conduct of discriminant analysis.

In discriminant analysis, a basic assumption is that the variance - covariance matrices are equivalent. Box's M tests (Table 6) the null hypothesis that the covariance matrices do not differ between groups formed by the dependent. This test should not to be significant so that the null hypothesis that the groups do not differ can be retained. For this assumption to hold good, Log determinants (Table 5) should be equal & M values should be

**Table 2. Sampling Profile of the Respondents**

| <b>Income</b>         | <b>Frequency</b> |
|-----------------------|------------------|
| Income<= 2 Lakhs      | 80               |
| 2.1 - 10 Lakhs        | 240              |
| 10.1 Lakhs and above  | 80               |
| <b>Total</b>          | <b>400</b>       |
| <b>Age</b>            | <b>Frequency</b> |
| Age<= 30 Years        | 146              |
| 31 - 50 Years         | 190              |
| 51+ Years             | 64               |
| <b>Total</b>          | <b>400</b>       |
| <b>Gender</b>         | <b>Frequency</b> |
| Male                  | 269              |
| Female                | 131              |
| <b>Total</b>          | <b>400</b>       |
| <b>Education</b>      | <b>Frequency</b> |
| High School (10th)    | 19               |
| Intermediate(12th)    | 31               |
| Graduation            | 141              |
| Post-Graduation       | 128              |
| Above Post Graduation | 80               |
| <b>Total</b>          | <b>502</b>       |
| <b>Occupation</b>     | <b>Frequency</b> |
| Government Service    | 66               |
| Private Service       | 155              |
| Professional          | 68               |
| Business              | 76               |
| Homemaker             | 14               |
| Agriculturist         | 22               |
| <b>Total</b>          | <b>400</b>       |

non-significant. Here, log determinants are almost equal, but M value of -50.135 is non-significant, which supports a favorable discriminant analysis.

Wilk's Lambda (Table 7) indicates the significance of the discriminant function. This table indicates a highly significant function ( $p < 0.000$ ), which is favorable.

These coefficients assign weights to the different factors in discriminant function. These Pearson coefficients are structure coefficients or discriminant loadings. They serve like factor loadings in factor analysis. Thus, the respective weights of all five attributes and age are as per the Table 8.

As per the Table 9, the unstandardized coefficients are used to create the discriminant function (equation). These operate just like a regression equation. In this case, the discriminant equation is :

$$D = (-0.463 \times \text{age}) + (-0.286 \times \text{Handling Problems}) + (0.120 \times \text{Fear of Theft}) + (0.278 \times \text{Fear of Misuse}) + (0.339 \times \text{Validation issues}) + (0.249 \times \text{Non-functionality}) - 0.740$$

The Table 10 clearly shows that two distinct customer groups are formed on the basis of five attributes of using



**Table 3. Group Statistics**

| Customers would use m-wallet: yes/no |                   | Mean | Std. Deviation | Valid N (list wise) |          |
|--------------------------------------|-------------------|------|----------------|---------------------|----------|
|                                      |                   |      |                | Unweighted          | Weighted |
| Yes                                  | Age               | 2.10 | 1.045          | 276                 | 276      |
|                                      | Handling Problem  | 2.91 | 1.512          | 276                 | 276      |
|                                      | Fear of theft     | 3.09 | 1.391          | 276                 | 276      |
|                                      | Fear of misuse    | 3.03 | 1.361          | 276                 | 276      |
|                                      | Validation issues | 3.06 | 1.360          | 276                 | 276      |
|                                      | Non-functionality | 2.99 | 1.398          | 276                 | 276      |
| No                                   | Age               | 2.74 | 1.125          | 124                 | 124      |
|                                      | Handling problem  | 2.00 | 1.653          | 124                 | 124      |
|                                      | Fear of theft     | 1.71 | 2.085          | 124                 | 124      |
|                                      | Fear of misuse    | 1.58 | 1.523          | 124                 | 124      |
|                                      | Validation issues | 1.65 | 1.496          | 124                 | 124      |
|                                      | Non-functionality | 1.52 | 1.458          | 124                 | 124      |
| Total                                | Age               | 2.30 | 1.106          | 400                 | 400      |
|                                      | Handling problem  | 2.63 | 1.606          | 400                 | 400      |
|                                      | Fear of theft     | 2.66 | 1.748          | 400                 | 400      |
|                                      | Fear of misuse    | 2.58 | 1.558          | 400                 | 400      |
|                                      | Validation issues | 2.62 | 1.543          | 400                 | 400      |
|                                      | Non-functionality | 2.53 | 1.566          | 400                 | 400      |

**Table 4. Tests of Equality of Group Means**

|                   | Wilks' Lambda | F      | df1 | df2 | Sig. |
|-------------------|---------------|--------|-----|-----|------|
| Age               | .927          | 7.662  | 1   | 398 | .007 |
| Handling problem  | .930          | 7.359  | 1   | 398 | .008 |
| Fear of theft     | .866          | 15.185 | 1   | 398 | .000 |
| Fear of misuse    | .813          | 22.493 | 1   | 398 | .000 |
| Validation issues | .819          | 21.695 | 1   | 398 | .000 |
| Non-functionality | .810          | 23.006 | 1   | 398 | .000 |

**Table 5. Box's Test of Equality of Covariance Matrices**

| Log Determinants     |      |                 |
|----------------------|------|-----------------|
| Would-use-m-wallet   | Rank | Log Determinant |
| Yes                  | 6    | 1.881           |
| No                   | 6    | 1.981           |
| Pooled within-groups | 6    | 1.730           |

**Table 6. Box's M Test Results**

|         |         |           |
|---------|---------|-----------|
| Box's M |         | 50.135    |
| F       | Approx. | 2.192     |
|         | df1     | 21        |
|         | df2     | 13317.408 |
| Sig.    |         | 0.006     |

debit cards along with customer's age. Customers having positive intention to use m-wallets would have discriminant value approaching 0.449. The Figures 1 and 2 exhibit the canonical discriminant function of the two distinct set of customers with one group having positive intention to use m - wallets and the other group which is not positively inclined to use m - wallets.

**Table 7. Wilk's Lambda**

| Test of Function(s) | Wilk's Lambda | Chi-square | df | Sig.  |
|---------------------|---------------|------------|----|-------|
| 1                   | 0.686         | 35.840     | 6  | 0.000 |

**Table 8. Structure Matrix**

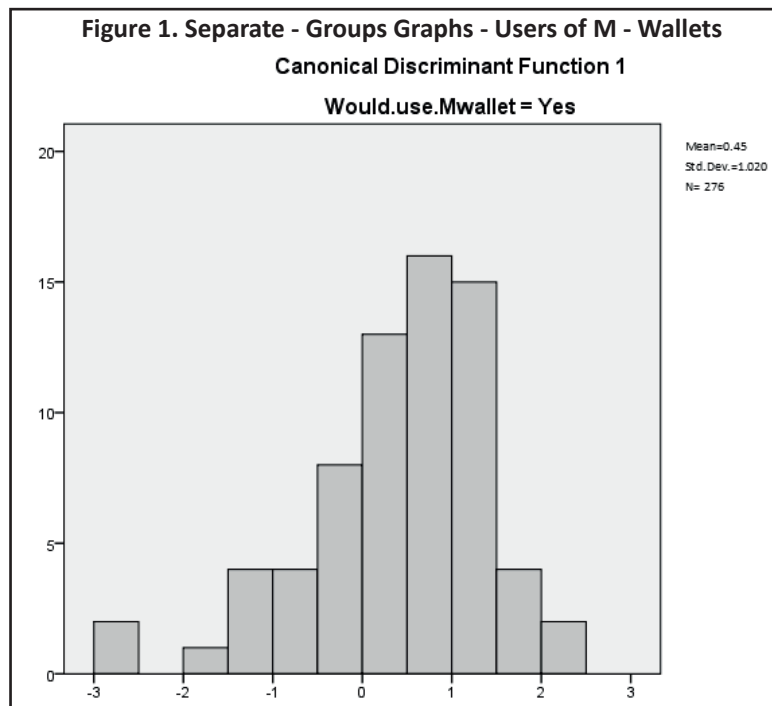
|                   | Function |
|-------------------|----------|
|                   | 1        |
| Non-functionality | 0.716    |
| Fear of misuse    | 0.708    |
| Validation issues | 0.695    |
| Fear of theft     | 0.581    |
| Age               | -0.413   |
| Handling-problem  | 0.405    |

**Table 9. Canonical Discriminant Function Coefficients**

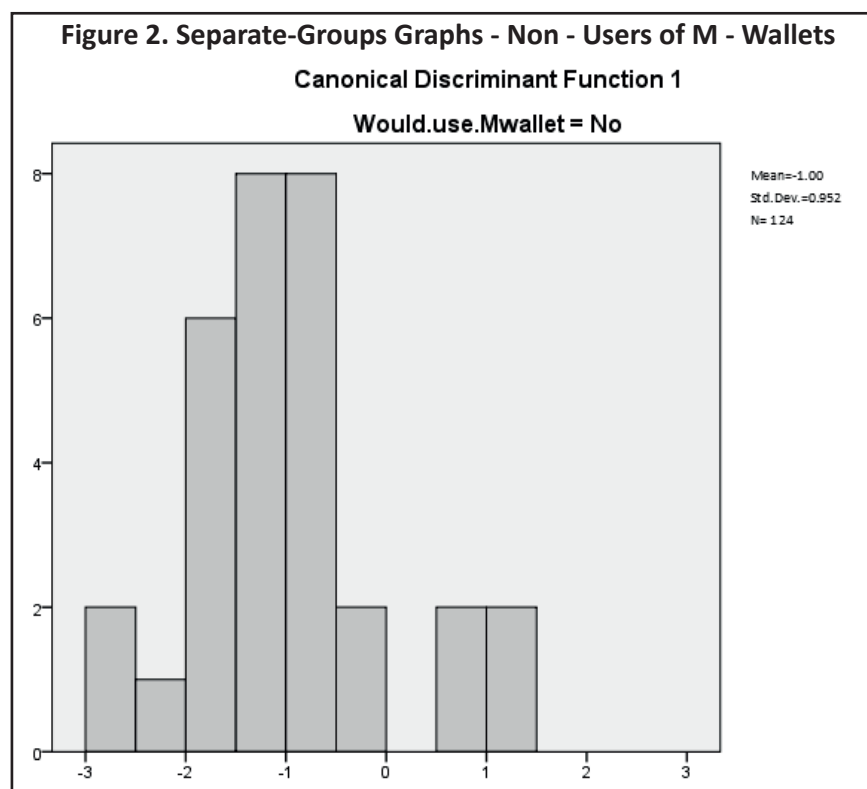
|                   | Function |
|-------------------|----------|
|                   | 1        |
| Age               | -0.463   |
| Handling-problem  | -0.286   |
| Fear of theft     | 0.120    |
| Fear of misuse    | 0.278    |
| Validation issues | 0.339    |
| Non-functionality | 0.249    |
| (Constant)        | -0.740   |

**Table 10. Functions at Group Centroids**

| Customer would use M-wallet | Function |
|-----------------------------|----------|
|                             | 1        |
| Yes                         | 0.449    |
| No                          | -1.000   |







**Table 11. Classification Results**

| Particulars     |       | Would use m-wallet | Predicted Group Membership |      | Total |
|-----------------|-------|--------------------|----------------------------|------|-------|
|                 |       |                    | Yes                        | No   |       |
| Original        | Count | Yes                | 248                        | 28   | 276   |
|                 |       | No                 | 48                         | 76   | 124   |
|                 | %     | Yes                | 89.9                       | 10.1 | 400.0 |
|                 |       | No                 | 38.7                       | 61.3 | 400.0 |
| Cross-validated | Count | Yes                | 244                        | 32   | 276   |
|                 |       | No                 | 48                         | 76   | 124   |
|                 | %     | Yes                | 88.4                       | 11.6 | 400.0 |
|                 |       | No                 | 38.7                       | 61.3 | 400.0 |

It is clear from the Figure 1, Figure 2, and Table 11 that 89.9% of the original grouped cases are correctly classified and after cross validation, 88.4% cases are correctly classified.

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## Findings and Suggested Model for M - Wallets

Six major attributes associated with usage of debit cards such as age of customer, handling problems of debit cards, fear of theft of debit card, fear of misuse of debit cards, validating issues, and non-functionality of debit cards are found to be the most significant attributes towards switching clients to m-wallets as an alternative as it

provides safer and easier payment method for different small but frequent transactions. Major benefits from m-wallets are increased security, faster payments, and cashless transactions.

✍ **Model to Test the Level of Inclination to Use M-Wallets** :  $D = (-0.463 \times \text{Age of Client}) + (-0.286 \times \text{Handling Problems}) + (0.120 \times \text{Fear of theft}) + (0.278 \times \text{Fear of Misuse}) + (0.339 \times \text{Validation issues}) + (0.249 \times \text{Non-functionality}) - 0.740$

If  $D$  approaches positive values near 0.5 or more, it would indicate yes, which means individual would be more inclined towards using m-wallets. If  $D$  approaches negative values near -1 or less, it would indicate No, which means that individual would not be inclined towards using m-wallets.

✍ **Values of Variables** : All variables except age for handling problems, fear of theft, fear of misuse, validation issues, and non-functionality would accept the value of ratings of customer preferences ranging from 1 to 5 (1 being the *least significant* rating and 5 being the *most significant* rating of these attributes while using debit cards). If age is below 20 years, value of age variable would be 1, if age is between 20 and 30 years, value of age variable would be 2, if age is between 30-45 years, value of age variable would be 3, and if age is 45 years and above, value of age variable would be 4.

## Recommendations

✍ The Model suggests that customers who are upto 45 years of age with lower ratings for handling problems (i.e. having no or lesser handling problems of debit cards) would be more inclined towards using m-wallets. Similarly, customers having higher ratings for rest of the four variables/attributes like fear of theft, fear of misuse, validation issues and non-functionality of debit, would also be more inclined towards using m-wallets. Therefore, service providers must consider these factors while formulating their marketing policies accordingly for their business growth and promotion of m-wallets.

✍ Expansion of service portfolios to enhance value addition in the utility of m-wallets by domestic service provider companies will be key growth engines in this segment. Money transfer businesses, followed by recharge, utilities, bill, and fund transfers (premium payments, etc.) will enjoy the maximum growth in this segment, thus it should be the major focus area. Working population engaged in banking and online purchasing of products should be offered some initial discounts and rebates to use m-wallets to induce seasonal purchases.

✍ Awareness creation drives should be launched advocating secure and cashless payments by m-wallets. However, in India, telecom service providers like Vodafone India and Bharti Airtel have their individual mobile wallet platforms, and they should come-up with versatile mobile account linked features to make them more popular in India. More tie-ups like Vodafone with ICICI Bank should come forward to strengthen this nascent market in India, which is at the introductory stage of the product life cycle but has a huge potential to grow.

✍ Internet connectivity is one of the major limitations, particularly in remote areas. However, after the Digital India drive of the government, Internet penetration has increased in remote areas as well. This has opened new and huge market avenues for domestic service providers. Taking this as an opportunity, domestic firms could use it as a major tool for financial inclusion as well at a later stage to promote cashless payments in remote areas to have deeper penetration of financial/insurance services in the long run.

✍ Smartphone prices have come down significantly. In the current scenario, after the integration of smart phones and Internet connectivity across the country, large numbers of customers are looking for more mobile based

interactions with banks, finance companies, telecom companies, retailers, etc. Simple, customer friendly, value added products with assurance of security of payments would be the key to get a competitive advantage in the business of m-wallets for domestic service providers.

## Policy Implications

Policymakers, while making the policy for cashless payments and financial inclusion, must keep in mind that m-wallet is perceived to be more secure for cashless payments as compared to debit cards in terms of quick validation and easier handling issues. Thus, lesser service tax should be imposed on the payments of m-wallets. Service providers must focus on the population below the age group of 45 years to pitch m-wallets for larger business volume for rapid capital formation in the economy.

## Conclusion

After demonetization in India by the Union government, m-wallets turned out to be a prerequisite to boost the economy and trade. Despite this, the m-wallet market is facing challenges in India. Lack of awareness, stringent policies on restriction of cash-out facility, less focus by major public and private banks for promotion and poor Internet connectivity in many areas are holding back growth of m-wallets. The m-wallet industry is still in a nascent stage, it offers exciting opportunity for innovations and experiments. Therefore, offerings should be based upon extensive research and customer insights from pilots. Mobile banking and subsequently m-wallets have the potential to emerge as game changers in terms of costs, convenience, penetration, and the speed to reach the masses. Payment industry is slowly approaching a tipping point. Thus, mobile wallet would inevitably become a viable everyday payment tool in the coming years all across the country and has the potential to become an integral part of the financial inclusion drive in the long run as well to boost up the Indian economy which has recently been hit by short term challenges of demonetization.

## Limitations of the Study and Scope for Further Research

A country like India has immense potential for expansion of financial services based on cashless and secured payments in urban as well as rural areas. It is really significant to explore m-wallet as an alternate, secure, and cashless payment tool based on different financial needs of customers. After the influx of smartphones with internet connectivity even in remote areas, the use of m-wallet platforms will be of vital utility that will stimulate financial inclusion in India later as well. Limited sample size has been one of the major limitations of the study. Research can further be extended to product innovations, technology, feasibility, viability, and different marketing dimensions of m-wallets.

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