

FACTORS AFFECTING CONSUMER'S CHOICE TO USE MOBILE WALLET TO ACCESS M-COMMERCE INDUSTRY IN INDIA

Abhilasha Seam*, Raja Sekhar Reddy*, Snehil Agrawal*, Behara Krishna Chaitanya*, Himanshu Bist*, Suleman Safdar*, Pranav Ranjan Patil*, Purba Halady Rao**

Abstract: A mobile wallet is a digital alter-ego of the physical wallet. It stores the digitised valuables for authorisation and uses it accordingly to grant permission for accessing goods. The permission is granted by various forms, ranging from password, QR code, facial image and the like.

With the context of tremendous growth of m-commerce industry in our country an empirical research was undertaken to determine factors impacting consumers choice to use mobile wallet service. This paper describes how these factors were determined using Logistic Regression, and Structural Equation Modeling.

Keywords: Mobile Wallet, Indian M-Commerce Industry, Logistic Regression, Structural Equation Modeling

INDIAN M-COMMERCE INDUSTRY

M-commerce or mobile commerce in India is going through exciting times. Recently, the industry has seen unprecedented growth due to demonitisation that took place in Nov 2016.. Even before this phenomenon there has been large growth in everyday commerce carried out using mobile devices.

A study conducted in 2015 estimated that the country's market for mobile commerce was worth \$ 2 billion in 2014 estimated to grow upto \$ 19 billion in 2019. (<http://venturebeat.com/2016/01/16/indias-m-commerce-landscape-in-2016->

hyperlocal-and-growing-fast/). Much of this growth may be well attributed to the availability and use of smartphones to India public in general. Smartphones are already outpacing the growth of feature phones and are expected to show a massive 36 percent CAGR over the next five years making it to the 651 million mark by 2019. The unstoppable surge of smartphones in India continues with 29 percent of urban population with a base of 409 million users adding to its adoption. Because of this, the Indian consumer base is shifting to use mobile phones for payments as they are more convenient and faster than traditional payment methods. This makes it a huge potential for the m-commerce industry in India.

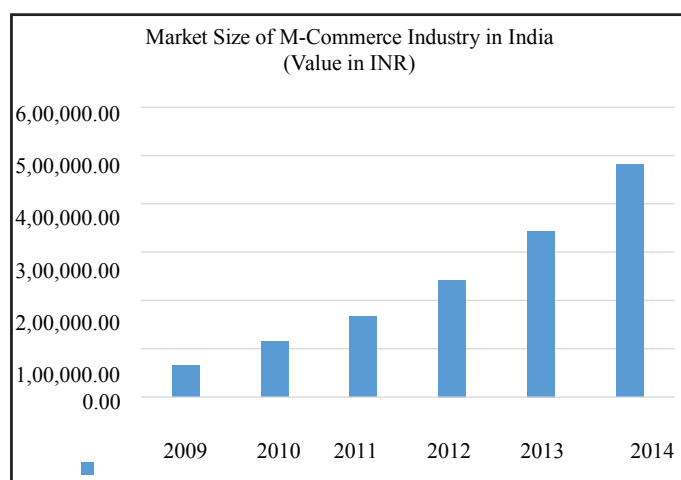


Fig. 1: Market Size of M-Commerce Industry in India (Value in INR)

* MBA Graduate, Indian Institute of Management Ranchi, Jharkhand, India

** Visiting Faculty, Indian Institute of Management Ranchi, Jharkhand, India. Email: purba.h.rao@gmail.com

Indian M-Commerce Industry Statistics 2013-14

(Source-Euro monitor International)

M-commerce volume y-o-y growth: 36%

M-commerce volume: US\$8.5 billion

Card payments as percentage of total consumer payments: 5%

Share of mobile internet subscriptions to mobile telephone subscriptions: 3%

The m-commerce industry is currently in its nascent stage but is growing rapidly.

Trends in Indian M-Commerce Industry

(Source-Euromonitor International, BCG report on Indian Mobile market)

About 45% of online consumers in India use only their mobile devices to access the Internet. This is expected to rise to 60% over next 3 years.

However, more than 80% of all consumer payment transactions are made in cash and not even half of the population fully uses traditional banking services

Due to shift in trend towards online payment, consumers will be able to use the mobile wallet for cash deposits and withdrawals, money transfers to any mobile device in India, airtime top-ups, bill payment services and pay for purchases at some stores via a text-based system.

This report primarily focuses on Paytm (which is an Indian e-commerce shopping website and mobile portal launched in 2010, providing mobile and DTH recharging services) as the m-commerce service provider for Indian consumers.

Paytm Statistics

(Source - Paytm blog, compiled from various internet sources)

Paytm has 7 million users and is targeting 15 million by the end of the year in association with Flipkart, Amazon, and IRCTC to provide its platform to facilitate payment. The company has crossed a milestone of having more than 10,000 vendors on its marketplace with 78 per cent growth month-on-month. The firm is now targeting to have 1 million merchants on its platform in the next two years.

LITERATURE REVIEW

A mobile wallet is a digital alter-ego of the physical wallet. It stores the digitised valuables for authorisation and uses it accordingly to grant permission for accessing goods. The permission is granted by various forms, ranging from password, QR code, facial image and the like.

However, the patent for a mobile wallet is claimed to be defining it as: a digital wallet would consist of a liquid crystal display not much bigger than a regular plastic bank card, with preferably a touch sensitive screen and simple user interface that lets the user flip through the digital wallet in the same way he/she flips through a leather wallet.

Kevin Erickson, described it as the device that can display and store coupons or account offers from business which users subscribed or engaged by providing real time discounts and offers from different business locations. It should act as the payment tool with credit and debit cards.

ECOSYSTEM OF THE MOBILE WALLET

The ecosystem can be understood through Fig. 2.

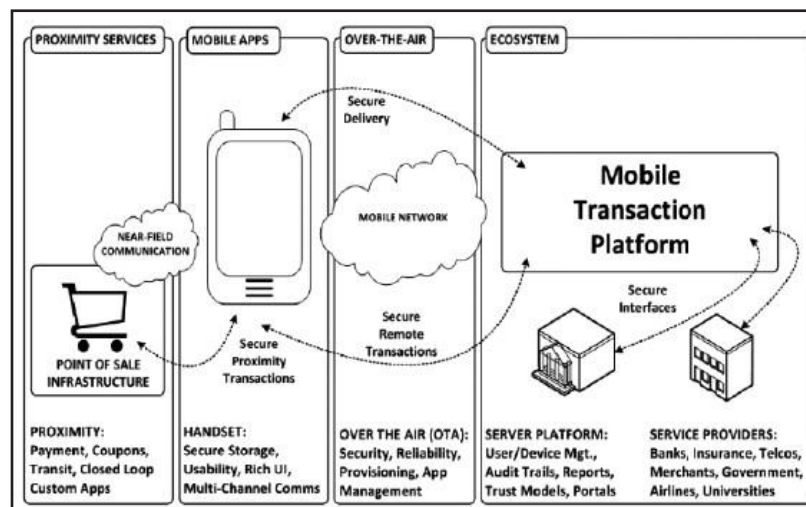


Fig. 2: The Official mobile wallet ecosystem (Pitroda & Desai, 2010)

A user can access his/her account using Near Field Communication (NFC), mobile apps over a cloud to make a secure payment. The communication that happens over the cloud is encoded and the possibility of data being corrupted is very less. The stakeholders can be understood as follows:

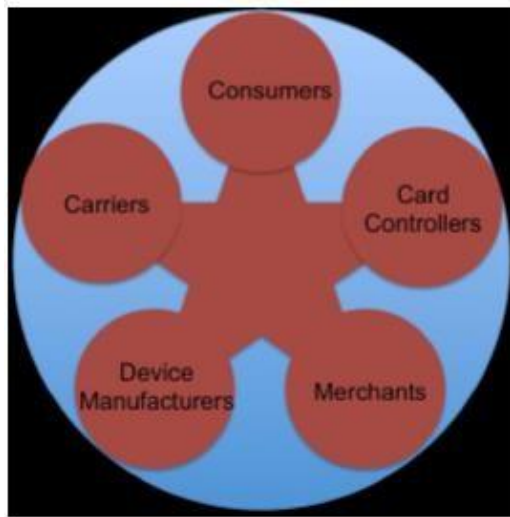


Fig. 3: Mobile Wallet Ecosystem (Stringer, 2014)

The stake holders are carriers, consumers, card controllers, merchants, and device manufacturers. A brief description of the stakeholders is as follows:

Card Controllers: They own the card or account database. They are further classified into three classes as Card network, Card-on-file Merchants and Digital Asset Companies. Card Network are the traditional card companies, who set regulations and pricing on cards. e.g.: Visa, American Express, etc.

The second class is the one who have both “physical infrastructure in place and a strong online card-on-file. e.g.: Google, Apple and others.

Digital Asset Companies are those companies that sell digital assets or physical assets online with little to physical presence.

Merchants: A mobile wallet is successful if it is accepted by a large merchant base. Merchants play a crucial role in success of the wallet.

Carriers: They are the mobile service providers.

Device Manufacturers: They are the smartphone manufacturers.

Consumers: Customers are to be made loyal. The best example can be of the Starbuck’s Mobile Wallet. It is used by 10 million customers making 5 million transactions per week.

MOBILE WALLET TECHNOLOGIES

a) **Direct Carrier Billing:** It is the direct operator billing, in which the users can make a purchase and the corresponding amount is deducted from the account. It is being implemented in Kenya for public distribution of water.

b) **QR and Barcodes:** They act as an authentication for transaction of money over the apps.

c) **Near Field Communication:**

This can be implemented in transferring money from one to another in a very short range of distance. This requires the devices be connected using GPRS. This is implemented in stores like Walmart to reduce the queue length.

d) **Cloud Based Solution:**

It enables ubiquitous, continuous and on-demand network access to a shared pool of configurable computing resources. Paytm is the example.

MOBILE WALLET SCENARIO IN INDIA

Indian mobile wallet market is expected to grow at a CAGR of 140.87% till 2018. This growth is characterised by the adoption of smartphones, tablets, and other mobile technology. The model of business is discount driven. There is a perception that mobile wallets are safer than the normal wallets. The market players are yet to identify a strategic difference in the product. In India, Paytm is the largest player.

MOBILE WALLET SCENARIO IN CHINA AND RUSSIA

Alipay: Alipay accounts for nearly 50 percent of transactions in China. Last year, Alipay announced its mobile payment volume was greater than PayPal and Square, combined.

Yandex: The Russian search giant also powers a popular e-wallet, with 22 percent of Russians using it regularly to pay online.

With this context of tremendous growth of m-commerce industry in our country an empirical research was undertaken to determine factors impacting consumers choice to use mobile wallet service. This formed our research question.

RESEARCH QUESTION

In the context of tremendous growth and opportunities opening up in m-commerce industry in India the current

study strives to determine the factors leading consumers to use mobile wallet service and thereby enhance the m-commerce industry.

CONCEPTUAL FRAMEWORK

Initially to find out the factors on which target audience base their decision for suggesting mobile wallet service, we did a focus group discussion. The discussion went on for 40 minutes and was regulated in between to make sure that it went on a desired course

The factors that were surfaced from the discussion are as follows

- (1) Multi-utility-Recharge, cab booking, movie ticket booking all under one roof

- (2) Fast service
- (3) Convenience - Don't have to go to the store
- (4) Direct operator billing: Partnerships (Ola/Uber)
- (5) Ease of use: Phone used for other purposes already, simple user interface helpful when short of cash
- (6) Promotions and offers: Cash backs, transaction security, no need to carry cash/ATM card everywhere, more options (for recharge)

Out of the mentioned factors, only six of them were considered for our study. The six were shortlisted based on the discussion during FGD (focus group discussion). The shortlisted factors are shown in Fig. 4.

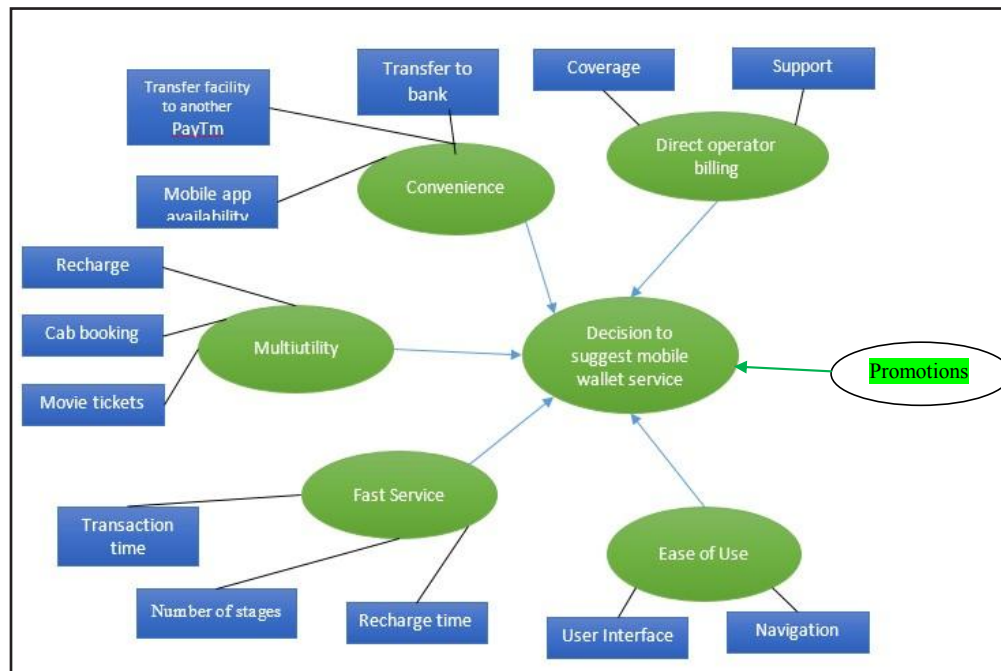


Fig. 4: Shortlisted Factors for the Study

(Source: Authors' own conceptualisation.)

This model was conceptualised as a structural equation formulation. While all of them are considered as constructs, we have identified predictor variables for each construct as well. A total of 17 predictor variables were associated with the six constructs.

The above conceptual framework depicts the model that we have decided upon to carry out the research.

RESEARCH METHODOLOGY

The Sampling Design

We planned to have respondents from students of post graduate courses at Indian Institute of Management in Ranchi to respond to the questionnaires.

Data Collection

The questionnaire was given to the students in the form of an online survey to be completed by them in approximately 20 minutes and data were collected anonymously within the planned data collection period. A total of 14 questions were used for the survey. Likert scale is used for gauging the importance of constructs and predictor variables. Four demographic questions and one question for result are used.

Survey Instruments

The team designed questionnaire that consist of elements addressing three areas.

1. Importance of predictor variables
2. Importance of constructs with respect to wallet service provider
3. Demographic data

All the questions were directed towards getting responses in order to execute the following analyses:

1. **Gap Analysis:** To determine the factors in which a mobile wallet service did well and the factors in which it lagged behind. Thus, identify the gaps in a service offered.
2. **Structured Equation Modeling:** To spot factors and sub-factors which make a significant impact on consumer's decision to suggest the service to friends and relatives
3. **Logistic Regression:** To identify which factors lead to a consumer of wallet service to make the decision.

Margin of Error

Sample size obtained =n =102 responses

Using,

$$n = z^2 / 4 * (\text{Margin of Error})^2$$

Table 1: Margin of Error

	Z-score for 95% and 90% confidence interval	
	1.960	1.645
(Margin of error) ²	0.0094156	0.0066324
Margin of Error	0.09703	0.08143
MOEin%	9.7%	8.14%

This implies that the estimates we make out of the data collected will be Within a margin of 9.7% for 95% confidence and 8.14 % for 90% confidence.

Requirement for margin of error to be less than 5% is 385 samples.

Constructs used in the Analysis

The constructs were:

1. Multi-utility
2. Fast service
3. Convenience
4. Direct operator billing
5. Ease of use
6. Promotions and offers

The above variables are mentioned in the conceptual framework.

Data Analysis

Data Analysis was done in two parts, Logistic Regression and Structural Equation Modeling.

Logistic Regression: Forward LR method

In this approach, a binary dichotomous dependent variable, D, was used with the above mentioned six predictor variables:

D: How likely would you be to recommend mobile wallet to friends and associates?

Likely (1) Not Likely (0).

Results of Logistic Regression

Table 2 (a): Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	18.249 ^a	.564	.889
2	10.559 ^a	.595	.938

Table 2 (b): Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.000	2	1.000
2	.190	5	.999

Table 2 (c): Classification Table^a

	Observed	Predicted		
		Recommend		Percentage Correct
		0	1	
0		21	0	100.0
Recommend				
Step11		78	94.0	
Overall Percentage			95.2	
0		2	90.5	
Recommend				
Step21		82	98.8	
Overall Percentage			97.1	
5				
19				
1				

The model converged after two steps with the following log it function. The variables significantly affecting the probability of a customer of “Paytm” recommending it to its friends or relatives are:

1. Direct Operator Billing
2. Promotions and Offers

The results in the second step are acceptable as the -2LL statistics reduces significantly i.e., from 18.25 in the first step to 10.56 in the second step. The Hit ratio in the second step increases to 97.1% from 95.2%. The Nagelkerke R-square also reaches 0.938.

All these point to the fact that the results of step-2 of the logistic regression can be accepted and thus the probability of a customer recommending Paytm can be estimated by the following formula:

Table 2 (d): Variables in the Final Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step1 ^a	Direct_Operator_Billing_C	20.675	3188.435	.000	1	.014	953130337.243
	Constant						
	Direct_Operator_Billing_C	-62.614	9565.307	.000	1	.034	.000
Step2 ^b	Promotion offers_C	19.182	6.672	3.465	1	.035	214172409.061
		1.939	1.022	3.596	1	.021	6.952

Constant -64.827 24.016 5.3441.059

Probability of recommending Paytm (p) = $e^z / (1 + e^z)$

Logit Function: $z = -64.287 + 1.939 * \text{Promotions} + 19.182 * \text{Direct Operator}$.

Hence the company would need to significantly enhance Promotions and Direct Operator variables.

Structural Equation Modeling

In Structural Equation Modelling, one considers a series of regression equations connecting the constructs to indicator variables. The model fit is given by Chisquare/ degrees of freedom, which should be less than 2.

Overall model p-value which should be $> .05$

$0.97 \leq \text{CFI} \leq 1.00$

$0.95 \leq \text{GFI} \leq 1.00$

$0.90 \leq \text{AGFI} \leq 1.00$

$0.95 \leq \text{NFI} \leq 1.00$

(Source: Schermelleh-Moosberger and Muller, 2003)

The individual links, to be significant, must have critical ratio > 1.96 .

Using this approach the research tried to determine which variables would significantly lead to the dependent variable which was “Recommendation”.

Upon running the model the results giving the Indicators of Goodness of Fit were:

The results of Chisquare/degrees of freedom = 1.230, < 2.

Thus this indicator was a good fit.

Overall model p-value = .068 > .05, which was also an indicator of good fit.

Also GFI, NFI, AGFI and CFI were at acceptable level.

The Regression Coefficients and their associated significances are shown in Fig. 5.

Recommendations	<--	Multi	.015	.04	.349	.72
	-			4		7
Recommendations	<--	Conven	-.341	.06	5.05	**
	-			7	2	*
Recommendations	<--	Ease	-.166	.08	1.87	.06
	-			9	1	1
Recommendations	<--	Promotions	.340	.10	3.16	.00
	-			7	4	2
Recommendations	<--	Directbill	.377	.09	4.10	**
	-			2	3	*
Recommendations	<--	Fast	.222	.05	3.72	**
	-			9	8	*

Fig. 5: Regression Coefficients and Their Associated Significances

Using the above results, the final structural model emerged as shown in Fig. 6.

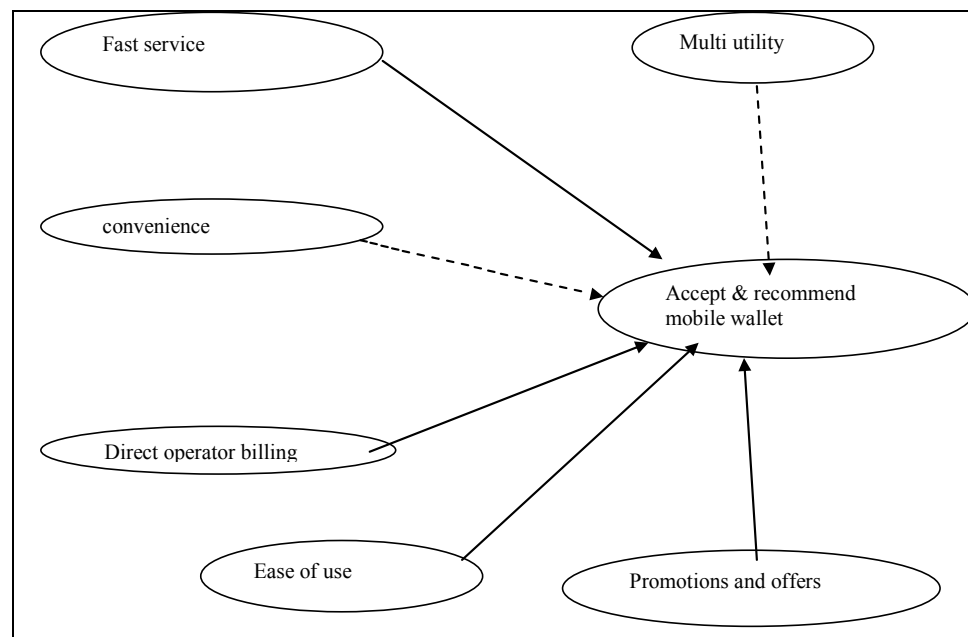


Fig. 6: Final Structural Model Giving Significant Links in Bold Lines

From the data analysis, we had observed that convenience, promotions, direct bill, and fast service are significant, in the sense they significantly impact the dependent variable. Fig. 6 graphically demonstrates these results.

The bold link signifies significant link.

The dotted link signifies not-significant links.

Thus for enhancing the use of mobile wallet fast service, direct operator billing, ease of use and promotions & offers have to be strengthened and be made available.

REFERENCES

- Ewing, D., Leberman, R. K., Serran, E., & Jon, S. (2014). The keys to driving broad consumer adoption of digital wallets and mobile payments. Retrieved from <http://www.mckinseyonmarketingandsales.com/the-keys-to-driving-broad-consumer-adoption-of-digital-wallets-and-mobile-payments>
- Mobile Wallets and Consumer Adoption (2015). Retrieved from https://www.javelinstrategy.com/sites/default/files/files/reports/15012.Mobile_Wallets_Consumer_Adoption.pdf
- Pitroda, S., & Desai, M. (2010). Transactions without borders: The March of mobile money. Retrieved from <http://nextbillion.net/the-advancing-march-of-mobile-money/>
- Stringer, R. (2014). Mobile wallet ecosystem, an overview and market analysis. Retrieved from <http://www.cortex-mcp.com/downloads/whitepapers/Cortex-MCP-Mobile-Wallet-Ecosystem-Q2-2014.pdf>
- Yeung, R. M. W., & Wallace, M. S. (2016). *Logistic regression: An advancement of predicting consumer purchase propensity*. Institute for Tourism Studies, University of Macau, Macao, China.