

**Usage of Plastic Money and Virtual Wallet as Modes
of Payments in and around Bengaluru City**

**Doctoral Thesis Submitted in partial fulfillment of the requirements for the award
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March, 2017

Declaration of Authorship

I declare that this research thesis titled “Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Bengaluru City”, submitted by me in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy in Management by the ICFAI University, Jharkhand, Ranchi is my own work. It contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text. I further state that I complied with the Plagiarism Guidelines of the University, while preparing the thesis.

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List of Symbols



.....Rupee

List of Abbreviations

Plastic money: A term used for plastic cards that are in everyday use and come in various forms like credit card, debit card and pre-paid cards.

Virtual wallet: The use of electronic device to store card related information and make electronic commerce transactions and payments. The bank account of people can also be accessed from this wallet.

NFC: Near field communication is a technology which enables exchange of information between two devices in close proximity only. This information exchange is secured with the use of hardware and software components which identify the device and secure the communication between the devices which is used for payments.

Bitcoin: A peer to peer open source way of exchanging value. This is a crypto currency and is not linked to any government. It was started in 2009 and is gaining more acceptances since then.

GDP: Gross Domestic Product is the sum total value of goods and services produced in the country in the given financial year.

EMV: EMV is (Europay, MasterCard, and Visa) is a set of standards to enables the acceptance and processing of chip-based payment cards at POS terminals

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Chapter1: Abstract

Chapter1: Abstract

The purpose of this research is to study Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Bengaluru City. In order to comprehend this objective, the set of objectives are framed to assess the level of awareness among the banking customers pertaining to the use, spend and awareness of Plastic Money and its use and benefits along with the use of Virtual Wallet Services which includes the gadget; its use and benefits.

The study includes the assessment of the perception and preference of banking customers (both users and non-users of plastic money or virtual wallet services) on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services identified, on the basis of analysis of perception, identify the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.

Devise suggestion pertaining to creation of awareness among the customers about all these modern banking gadgets and their usefulness. The suggestions also include ways to educate the customers in order to wipe out the wrong perception, if any, on plastic money and virtual wallet services. Finally, these suggestions should strengthen the security aspect involved in all such gadgets which is the main concern of the customers for using those gadgets.

The scope of the study is confined only to Credit Card, Debit Card and Virtual Wallet Services and would take into account both users and non-users of such modern banking gadgets in and around Bengaluru city.

Keywords: plastic money, virtual wallets, mobile banking.

Chapter 2: Introduction

Chapter 2: Introduction

2.1: Overview

Plastic money and virtual Wallet are financial instruments that give access to immediate credit or debit facility with convenience, ease of use and security. The use of cards and wallets is linked with the benefits they offer. While plastic money offers easy access to money and credit in the form of credit card, debit card and pre-paid cards, virtual wallet technology offers convenience, electronic records facility and automatic management of accounts or taxes for the users. As virtual wallet is an application on the mobile device so the wallet is a handy application that is available round the clock.

Perception and benefits of this technology associated with Plastic money and virtual wallets drive the usage and benefits for the users. Evolution of technology is the key enabler for the proliferation of financial instruments and also changes the usage and transaction patterns of users which in turn are based on user perception. The study provides insight which can help in the framing of actions to augment the use of Plastic Money (credit and debit cards) and Virtual Wallet Services in India.

The payment industry is undergoing rapid change where the payment landscape and payment instruments are evolving rapidly aided with the recent advancement in computing and mobile devices. Shay and Dunkelberg (1975) and Dunkelberg and Smiley (1975) studied card holders, collected data on non-banking card holders in New York grouped finding by income, age, occupation and types of card held. His research showed that the card usage was prevalent in social class with good economic advantage and decreased after retirement. Though these parameters are relevant the payment system indicators from Reserve bank of India clearly highlight the emergence of Credit/Debit cards which show double digit growth from 2013 to 2014. The same year has seen performance of mobile-wallet and mobile banking with 228% increase in volume of mobile wallet and 77 % growth in mobile banking. Value wise mobile wallet has

increased by 190% and mobile banking has increased by 274% and the growth rate continues to increase every year. This makes it important to evaluate the instruments in new light to understand what drives the usage pattern for the modern age.

Organizations are evolving new patterns to increase the use of the card and wallet technology. Research was carried on potential clients in both online and on individual basis to analyze organizations changes with the advent of cards and wallets. Concerns of banks like profit margin and growth with regards to overall business volume not being large enough to extend banking facility to everyone can now be addressed with the virtual wallet services. Organizations have realized the need to tap the new potential of using mobile wallets and would like to invest in new array of technology with care. Adoption of wallet technology with the right amount on advertisement and spending for the target audience would be the key to success.

New financial organizations in recent years have tried to enroll the masses to the banking systems via financial inclusion and the use of biometric identity card like Aadhar has made a difference but these organizations are still struggling to achieve the critical mass. According to bank of India Statistics of 2014, it is stated that 41% of Indian's are unbanked and the problem is acute in both rural and urban areas. While 40% of the population is unbanked in urban area, 61% of the population is unbanked in rural areas (RBI 2014 data set). Study highlights the importance of financial inclusion in the country and much more important is the financial freedom. The study aims to assess the level of awareness among the banking customers pertaining to **use and benefits** of plastic money and virtual wallet services.

While the growth is attributed to many factors like the recent advancement of technology and the innovation in the payment industry, it is equally important to remember that many Indians are un-banked and many in the country are struggling to earn square meals a day. The study aims to **analyze the perception and preference of banking customers on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services** and suggest various measures on a variety of

parameters for a unique country like India. Results of collected data is analyzed to show the business potential and highlight social requirement.

In a speech, the Nobel prize winner Muhammad Yunus and the founder of Grameen bank/micro credit bank in Bangladesh highlighted that most of the people need money to create money and masses struggle to get the first dollar and consequently they are forced to take money from the local money lender and are forced to pay heavy interest and remain in debt for a very long time if not the entire lifetime.

Financial freedom is as important as the freedom of speech and expression. Plastic money and innovative forms of credit given to working professionals and the masses is not extended to very low income groups.

The history of India is full of example where people have used their energy and potential to run large scale financially viable business like Dabbawala in Mumbai and Shri Mahila Griha Udyog Lijjat Papad. Grameen bank in our neighboring country is another example of success of manpower and microcredit facility. Traditional banking system has left a huge segment of society unbanked which needs to be tapped.

It is important to extend the advantage of debit and credit cards to small business units to increase the GDP of India or any country. The positive impact of increasing the number of earning members in the society would have a positive effect on the society as well. Individuals can start business with low investment and spend their time productively.

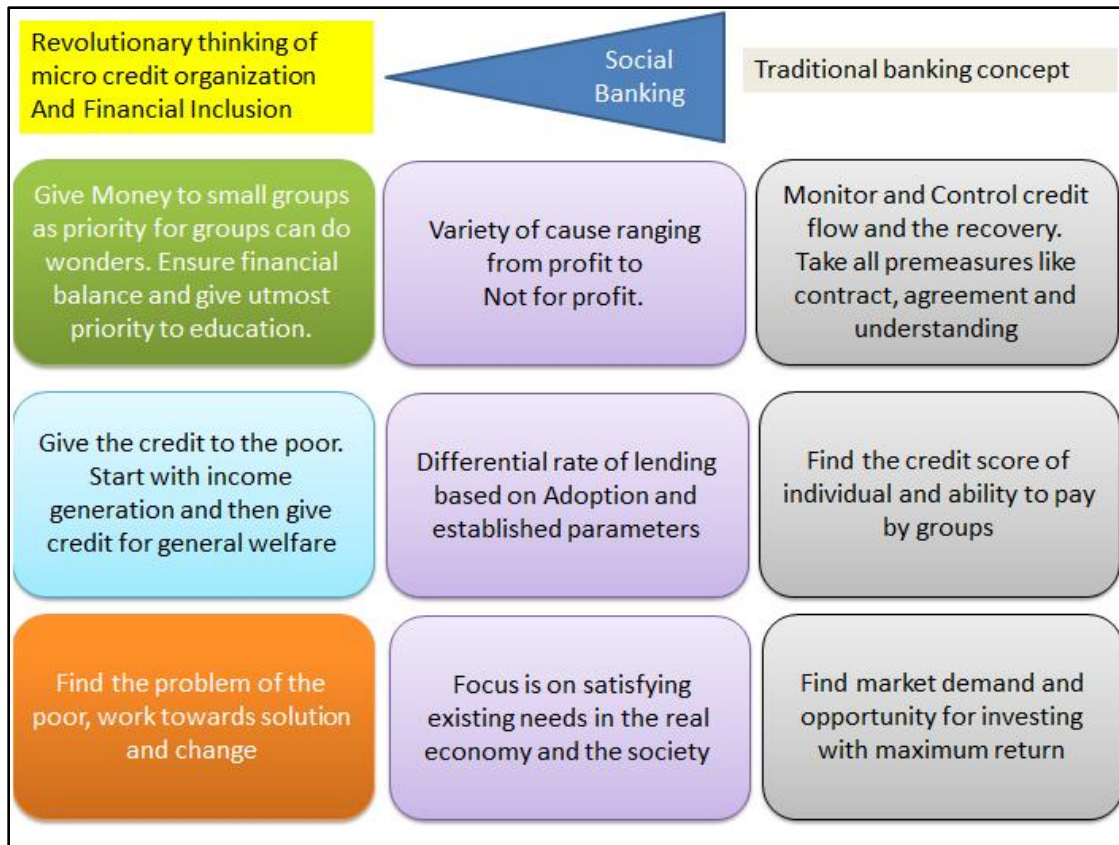


Fig 2.1.1: Ideology difference between traditional, social and microcredit Operation.

The figure given above shows the ideology differences between the traditional, social and microcredit lending operation. While the traditional lending focuses on the ability of individual to repay the loan, the emerging social and microcredit organizations focuses on social needs and working for the marginalized society. The notable differences between the traditional emerging alternate lending patterns are the faith in people and the change in the repayment methods. In alternate lending methods the individual can repay by giving their farm produce or service. All this is not currently possible in the card and the mobile wallet technology but the author is of the view that **alternate lending and recovery methods would soon be main-stream** and would be the key to financial inclusion in the near future. Faster, easier and more affordable banking in the future would help in greater penetration of banking sector into the hinterland.

Evolution of the credit and debit cards has made it possible to **track the user's history**, get the credit score and retrieve his favorite buying and spending patterns. The **pattern mining** would help business send customized deals based on location, personal favorites and the cards would also work with new technology like “Beacon” for retails, near field communication for hyper local shopping, QR based technology for retail buyers and retail payments and much more. All this technology marvels would make perfect business sense when it is lined with the plastic money and virtual wallet technology to give a smooth and great user experience in stores and web. **In the future the card would become “THE IDENTITY”. The aim of the thesis is to identify, on the basis of analysis of perception, the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.**

Suggestions given in this study is based on results of the analysis and the probable impact of the strategy. Intention while serving specific customer segments is also analyzed indirectly which focusing on the key elements of the survey which focuses on plastic money and mobile wallet. The suggestions aim to facilitate process and structure user information in preparation for the creating of an efficient, affordable and differentiated tool/product. The recommendation put forward by this thesis aims to bring out new product ,suggestion and increasing the customer base by financial inclusion and alternate lending and recovery pattern for the broad segment of society. Most of the respondents have given valuable feedbacks and also asked for more features and security measures to be introduced. **Convenience is desired but that may not be sufficient to take banking to remote locations in India till alternate lending and recovery methods are introduced.**

The users have to be educated about the security standards and the judicious use of cards. Micro credit can be targeted as the new RuPay cards with debit and credit facility would reach the majority of the masses when users open new postal accounts. Banks have to innovate and reduce fees and address security measures wherever required.

Virtual wallets and mobile payments need much more attention and should experiment with alternate lending and recovery methods.

Customer Education and Banker Education are some of the other measures suggested in the paper.

2.2: Scope

The primary objective of this study is to study **Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Bengaluru City** but the same would have relevance in other parts of the country.

The following points exhibit the scope of the Study.

- The study is confined only to Credit Card, Debit Card and Virtual Wallet Services
- The study has taken into account both users and non-users of such modern banking gadgets.
- The users and non-users are randomly surveyed.
- Geographically the study is in and around Bengaluru city.

2.3: Research Motivation

The ever increasing computing power in the hands of individuals has changed the entire technological landscape and how people exchange currency. The Plastic money has changed with new chips embedded in cards. Similarly, Virtual wallet technology has emerged as a critical differentiator for banking and non-banking corporations where this is being used as a handy means of exchanging value at convenience round the clock.

India is trying to achieve maximum financial inclusion and the paper aims to highlight key parameters like user perception while using these financial instruments. India is moving towards a cashless society and researcher aims to highlight the

perception of society while using plastic money and virtual wallets. Researcher also aims to find the key uses of these financial instruments which would help in formulating the correct analysis of this study for rapid adoption of Plastic money and virtual wallet. There are lots of research papers which aim to provide valuable information and the current study is trying to focus on a particular in and around City to understand the key parameters and thus add value to the existing body of knowledge.

: I have worked in technology and have a keen interest in management and social studies. As a user I am interested in plastic money and wallet technology which offers access to money in the form of credit card, debit card and virtual wallet and other technological offerings.

Both these topics have future scope for innovation and research. So I had an aim to study both plastic money and virtual wallet as these are evolving rapidly and changing the way in which users and non-users exchange money and trade electronically.

[2.4 Overview of Research Approach](#)

The research is based on a customer satisfaction survey performed in and around Bengaluru City. This survey was conducted in both online and physical form. Survey was conducted on several different areas of Bengaluru which consists of different areas of customer opinion, customer characteristics, customer satisfaction and customer's needs. As cards are financial products, the growth in cards is driven by customer satisfaction.

On the perception analysis a series of measures can be used to explain the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.

This result would be arrived at by filtering out the list of priority items and segregated by positive and negative impact on customer acceptance, frequency of use and satisfaction rates. One of the challenges in this case is to assure consistent result over a

space of time as the market is ever changing and the recent spur in innovation in this space proves critical for success. **Technology Acceptance Model (TAM)** theory is used in this research which indicates a positive indicator for adoption of how new IT innovation. TAM lays emphasis on a modified technical assessment model which is used in this case as there is an involvement of plastic money which is there since many decades and the relative new one like the virtual wallet technology.

- Perceived ease of use
- Perceived usefulness

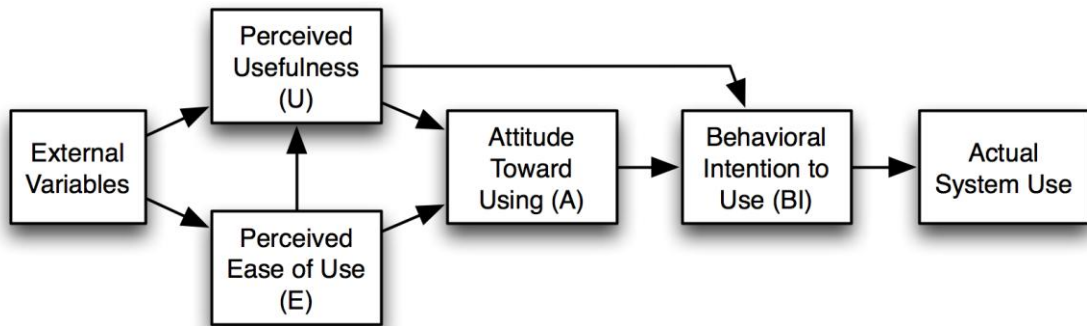


Figure 1 Technology Acceptance Model version one (Davis, Bagozzi & Warshaw 1989)

Primary and secondary data was collected by interviewing large number of respondents in and around Bengaluru City. Two pilots were conducted before the final questionnaire was prepared. The questionnaire was tuned to find out the right balance of questions and to targetspecific areas that can be used as key metrics in the research.

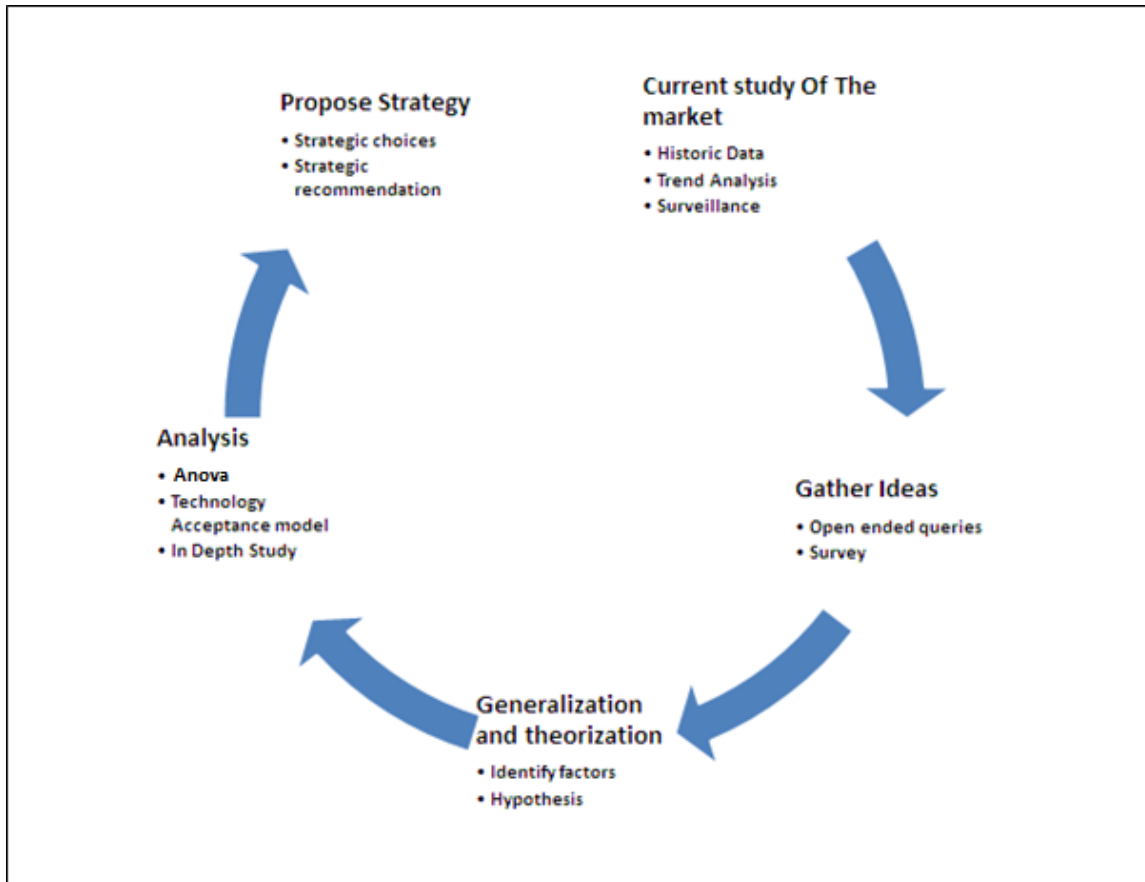


Figure 2 Survey Method

The survey was modified multiple times and the evolution was gradual. The interviews and surveys were carried out in multiple phases. Results, findings, risks, and implications for each phase was taken into account while planning for subsequent phases and refining the same.

The research was carried out by studying the current market, gathering ideas, generalization and theorization to identify factors that influence plastic money and Virtual Wallets and create hypothesis for testing. The research was conducted in phases to gather ideas and suggestion.

1. Review of existing literature and research

2. Conduct online and face to face Surveys & interviews
3. Develop and document findings

The data is analyzed and theory is proposed which can be used to create strategic choices and recommendation.

Though virtual wallet is an alternative product or a way to store card information in digital form, it is different in many respects. Additional option is available in virtual wallets which make it competitive when compared with the financial products given by credit and debit card providers. Variability in the products is also brought about due to the recent spur in innovation in the financial products. Based on the perception the survey like any other customer survey, tries to understand the impact of explanatory variables on the overall dependent variables.

The insight gained from the study can be used to put forward suggestion for use and growth of plastic money and virtual wallet services in India. The difference in the consumer expectations from the financial instruments is the key driver for the demand of these services in India. From this perspective the data collected can be used to assess the level of awareness of the benefits of the instruments like cards and virtual wallets. The satisfaction from the cards varies from person to person and for different kinds of products used by them, so this survey aims to analyze the perception and preference of customers on transactions through plastic money and virtual wallet services. The effect on individual perception is a sum of several psychological and physical variables.

The pilot was the first phase and was limited to a small sample to understand the perception of user and the benefits the users see in use of these products. The next phase was on larger number of survey participants. The study provides insight into the perception and awareness about Plastic Money and Virtual Wallet Services.

2.4: Contribution of Research

With the help of the research, the researcher aims to provide valuable data and summary analysis which is always sought after for plastic money and virtual wallet services. The areas such as payments and virtual wallets are seeing rapid progress and innovation. This coupled with the huge investment done by banks and other entities have resulted in new banking products. The research goes beyond much other research as it looks to the social side of the story with focus on different consumers and their wants. The paper tries to find the benefits and challenges in using advanced features for both plastic money and virtual wallet. As this research is mostly concentrated in Bengaluru so this is a value proposition for Indian payment industry and can be leveraged by banking and other units to drive growth, customer satisfaction and revenue. Apart from this the findings should help entities create profitable business ideas for the poor and marginalized section of the society.

The overall objective should help in creating awareness; increase the penetration of cards and virtual wallets in India. This would lead to an accountable and cashless society and decrease the payment and settlement cycle in the country. The cumulative effect of the set of recommendation should be positive for the GDP of the nation as the paper emphasized on alternate lending and recovery methods for more than a billion people in this country.

2.5: Outline of Thesis Chapters

Chapter 3 gives an overview of the history of credit and debit cards and the sequence of recent innovation in the payment space and the impact of the recent technological innovation that is disrupting the payment industry. The evolution of the mobile wallet and plastic money with the change in the business and this chapter gives the introduction of the research problem and the various elements of the credit card and debit cards.

Chapter 4 shows the different types of cards available in the market and the current perception about the cards. Intended and recommended usage patterns associated with plastic money and virtual wallets with the advent of new technology. This would be useful to set the correct expectation and compare it later in the survey. The following categories would be documented for this paper.

1. Economic factors like Growth and Saving.
2. Technical factors that determine use of these instruments.
3. Demographic factors like age and how it affects the usage and adoption of cards.
4. Perceptions factors like security, ease of use, convenience
5. Education and awareness about the use of these instruments that affect the use.

Chapter 5 focuses on the use of statistics to test the research hypothesis and assumptions done during the course of research. This chapter gives an insight into the methodology those changes in the way the data was collected. The chapter discusses the rationale used while drafting the questions for sample study and the differences in questionnaire for Plastic Money and Virtual Mobile Wallet.

Chapter 6 provides the details of the Pilot study and the responses received from the study. It also highlights the changes and refinement made after the pilot study.

Chapter 7 gives the analysis on data points highlight finer elements in the data sample that was collected during the survey. This chapter focuses on various dimensions to extract key information that can be used in multiple ways.

Chapter 8 presents the survey that was carried out in Bengaluru for Plastic Money. The chapter gives the overview of data collected for economic, technical, demographic, perceptions education and awareness about the use of these instruments. This chapter covers descriptive statistics and analysis under various categories. This chapter also presents the survey that was carried out in Bengaluru for mobile wallet. Compares how plastic money and virtual mobile wallets affect intended users. It also compares the user's perception for both the categories. Users Acceptance of Technology in Payment Industry and finally it leads to the action based on the study.

Chapter 9 is used to divide the various suggestion to create awareness among the customers about all the modern banking Gadgets and their usefulness it also helps in defining actions to educate customers and wipe out the wrong perception. With recommendations security aspects involved in all south credit and also address the concerns of the customers by using the gadgets.

Chapter 10 sums up the findings and compares it with the literary review and empirical studies carried out in this space. This chapter also discusses the limitations of this current research and scope for future research work.

2.7: Summary

The chapter described the objective of this study to access various factors that affect the usage and adoption of mobile wallet and plastic money in Bengaluru district so as to provide suggestion to increase the usage and adoption of plastic money and virtual mobile wallet. Overview of the chapter's is also provided in this section.

Chapter 3: Background and Contribution

Chapter 3: Background and Contribution

3.1: Overview

This chapter deals with the literature studied in partial or whole during the course of the research. This chapter covers the literature survey that was done during the course. Some of the data was also collected from internet and other sources like library. This is covered as part of the literature survey and the documentation of the history of plastic money and virtual wallet technology.

This chapter also outlines the chronological order in which plastic money and mobile wallets have evolved with the availability of new technology and massive computing powers in the hands of individuals. Card has been around since past 60 years in the current form while earlier there were “Open Book Credit” and other ways of managing debit and credit in general stores. Virtual wallets are a recent development in the last decade and have evolved rapidly with the advances in computing power.

Early work was done by Hirschman (Hirschman, 1979) on usage of credit card highlighting differences in Consumer Purchase Behavior by Credit Card. Similar work on usage was done by Hirschman & Goldstucker (Hirschman and Goldstucker, 1978). Slocum & Mathews (Slocum & Mathews, 1970) also studied usage patterns of users.

There are other aspects of Social class and repayment that was highlighted by Mathews and Slocum (Mathews and Slocum, 1969). Plummer (Plummer 1971) investigated other categories like Number, Usage, Income, Education, Age, and Occupation. Usage, Beliefs/Attitude for credit cards was studied by Awh and Waters (Awh and Waters, 1974). Hogarth, Hilgert, Kolodinsky, Lee (Hogarth, Hilgert, Kolodinsky, and Lee, 2001 and Hogarth, Hilgert, and Kolodinsky, 2004) suited number and repayment method in credit cards.

Debit card research also started in 20th century reflect the purchase aspect using plastic money was done by many individuals like Kenneth A. and Staten (Carow, Kenneth A. and Michael E. Staten, 1999) studied the influence on Gasoline purchase. Diana and Humphrey (Hancock, Diana and David B. Humphrey, 1998) studied the Transaction aspect of cards. Similarly, a lot of research has gone into usage and other aspects of debit card Elizabeth (Hirschman, Elizabeth, 1982).

Virtual wallet is a more recent phenomenon and has been created in this decade. These research papers not only delved with usage and security but a variety of other aspects like privacy Gauri, Jesudas and Nayanar (Gauri, Jesudas and Nayanar, 2014). Articles on usage (K. Taheam, R. Sharma and S. Goswami, 2016) and various papers written by industry experts have laid the foundation of virtual wallet. Wallet technology brings key differentiators to the table which also influences the usage and adoption of the technology in most cases.

With the advent of economical mobile devices after 2005, it became evident that the behavior of consumers has changed with the digital revolution. E commerce had gained prominence by this time leading to a spur in plastic money usage. Twenty-four hours banking facility at ATM, POS and over the web had a revolutionary impact in the payment landscape and environment. This also lead to a new generation of customers who were more demanding than ever before. The structure and evolution of these payment models have created mostly two types of wallets mainly a smart card issued by the bank and linked to user accounts and second one wherein smart cards built into customers Visa/MasterCard as per the paper written by Arup R. Guhathakurta.

3.2: Literature Review

The Literature study highlights the recent plethora of innovation in the field of payments and electronic payments especially after the advent of mobile devices.

Over the year's humans have moved from barter to notes, pay order, cheque, cards and electronic payments, mobile payments and even alternate payment or value based mechanisms.

The trend is towards cashless payment systems driven by electronic transactions. Most of the cards have a limit on the amount of transaction that can be done using the card. While NEFT and RTGS are electronic payments that can be used to pay larger amounts of money (currently 10 lakhs) there is scope for round the clock transaction support which was brought about by IMPS system. Currently such facilities are available via electronic banking only and might be extended to other payment mechanism soon. Literature review was done to look at the features cards and virtual wallet and understand various research work done prior to this study.

Handelsman and Munson (1989) in "Switching behaviors from credit card to cash payment among ethnically diverse retail customers" discuss the urge to use the cash instead of card and how it affects the revenue of the retail stores where credit card can bring in revenue for many retailers. The paper highlights four main usage motives to switch over from credit to cash at various incentive levels for user. It studies the price of products, frequency of use, preferred payment mode and monetary incentives. As credit cards have administrative overhead so the paper also highlights the difference due to full and partial payment options given to user.

Barker (1992) in "Globalization of credit card usage: The case of a developing economy" studied the user groups which were primarily targeted. The better educated, middle aged users were best target customers considering the ease of payment, risk of carrying cash. Lack of awareness on card leads to lower penetration of credit cards. The need to change the various processes associated with the card and proper administration is also highlighted.

Sultanaa and Kumar (2015) in "A study on customer payment behavior in organized retail outlets at Coimbatore district" unfold user perception on the ease of use for plastic money. Other influencing factors like income, education, convenience,

advantages and disadvantages over the payment modes was also studied. The paper studies the mode of payment opted by users.

“Plastic at a premium” by Vora and Gidwani (1993) shows how credit cards increase the purchasing power of people. Different cards come with different incentives which can be very useful for tele-ticketing, discounts, insurance coverage and provide reward points. The habits of Indian customers must change with time and the Indian customers are largely shy at this point of time. A change in behavior and spending pattern would change the usage of cards and keep the cards active.

Consumers’ Perceptual Biasness in Debit Cards of Indian Banks’ noted that the debit is the highly preferred mode of convenience and offers attractive facility for consumer markets, Prasad (2016). The ease of use, Convenience, Security and Reliability add to the growth in demand and usage of Debit Cards. The paper justifies the factors that users have while selecting cards and also talks about the preference for cards offered by public banks over private banks.

Mathur and George (1994) in “Use of credit-cards by older American” give a view of the usage patterns of older people. Factors such as income, employment, retirement status, and shopping habits should be considered and it is not correct to state that the older people do not use cards. While certain segments of users use less of cards as they grow older, others do not show such behavior and can continue to use the card on regular basis.

Mann (2006) in "Contracting" for Credit" studied the factors considered in responding to problems in credit cards and showed need to standardize terms in consumer transactions, description of contracting practices.

Thompson (2006) in “A Sociocultural Investigation of Consumer Credit and Consumer Debt” presented a summary of three research papers and a socio-cultural investigation into consumer debt and credit. The first paper by Crockett and Rose (2006) checked the role of credit card in user’s lifestyle. The second paper by Wang and Wallendorf (2006) was on the aspect of debt on consumer lifestyle. The third

paper by Diamond and Curry (2006) examined credit card "revolvers," who carry a monthly balance.

Scott (2007) in "Credit Card Use and Abuse: A Veblenian Analysis" studied the huge amount of consumer credit card debt in USA and concluded that the users are spending beyond their means.

Stephen (2007) in his research work, "Personality and credit card misuse among college students: The mediating role of impulsiveness" showed the negative impacts of the misuse of credit cards and how long term impact is not good for the card issuers. It studied the personality traits that affect card usage.

Prasad and Swathi (2012) in "Towards Cashless Society" studied the effect and usage of cards.

Shaik et al. (2012) in "A New Mobile Payment System with Formal Verification", take into account the effect of IT on cards and payment transaction. It also covers security aspects with mobile payments.

Perry (1997) in "Electronic money: toward a virtual wallet," highlights the importance of virtual wallets for payments.

Roland et al. (2012), in "Practical Attack Scenarios on Secure Element-Enabled Mobile Devices," covered the evolving payment technology like NFC and threats associated with new technology.

Themba and Tumedi (2012) in "Credit card ownership and usage behavior in Botswana" studied the effect of credit cards in Botswana and the finding suggest influenced by consumer demographics and in particular income, age, education, gender and marital status as well as attitude towards debt.

Demographic variables like occupational status, marital status, qualification, hidden charges and problem faced by users are not significantly related but relation exist for online shopping and income on frequency of use was done by JOY (2016).

Discounts and card facilities and the impact were studied in Dewriet al. (2016). Behavioral Analysis of Credit Card Users in a Developing Country: A Case of Bangladesh. This paper looks at an emerging economy where most of the demographic factors may not be so significant in driving the use of cards. A seemingly less important factor like discounts and facility seems to be a major deciding variable.

Bankruptcy due to credit card outstanding debt was studied by Ahmad (2016). It revealed the attitude of multiple card holders (3 or more) and the possible risk of bankruptcy due to misuse especially in young professionals.

Perceived risk on usage of credit cards and service experience link was studied by Chahal et al. (2014). They suggested that time is the biggest influencer followed by sense of security and confidence.

Limbu et al. (2012) studied the effect of risk of credit card abuse in college students and checked for age, gender, parental influence and materialism effects on consumers' credit card attitudes and behavior. Parental influence seems to discourage overuse of cards and women seem to manage cards balance better.

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
Wallet estimation models http://www.tau.ac.il/~saharon/papers/wallet-final.pdf	Research paper: "Wallet estimation models." <i>International Workshop on Customer Relationship</i>	Saharon Rosset, Claudia Perlich, Bianca Zadrozny, Srujana Merugu, Sholom Weiss, Rick Lawrence Predictive Modeling	2005	Develop predictive modeling approaches for SERVED and REALISTIC wallet estimation. Using new methodologies for modeling the REALISTIC

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
	<i>Management: Data Mining Meets Marketing.</i> 2005.	Group IBM T. J. Watson Research Center Yorktown Heights, NY		wallet: quantile nearest neighbor and quantile regression. Predictive analysis for Wallet estimation model
Share of wallet in retailing http://www.sciencedirect.com/science/article/pii/S0022435903000083	Article: Interaction plots for the moderating effects of the economic shopping orientation and the personalizing shopping orientation on the satisfaction–SOP	Elsevier B. V	2003	This study examines the effects of customer satisfaction and loyalty cards as well as consumer characteristics on customer share spent on the primary grocery store. Study the impact of loyalty cards on customer behavior.
How Well Do Consumers Protect Themselves from Identity Theft http://onlinelibrary.wiley.com/doi/10.1111/j	Research paper: Identity Theft	GEORGE R. MILNE	2005	Identity theft is a serious and increasingly prevalent crime, and consumers need to take preventative measures to minimize the chance of becoming a

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
.1745-6606.2003.tb00459.x/abstract				victim. Consumer education appears to be adequate for several identify theft preventative behaviors
Consumer Intelligence Series: Opening the Mobile Wallet http://www.pwc.com/us/en/industry/entertainment-media/publications/consumer-intelligence-series/assets/pwc-consumer-intelligence-series-mobile-wallet.pdf	Research paper: Consumption and intelligence	Ron Haas Chris Isaac Matthew Lieberman	2013	Through PwC's ongoing Consumer Intelligence Series, we gain directional insights on consumer attitudes and behaviors in the rapidly changing media and technology landscape. Explore consumer awareness, perceptions and willingness to use wallet.
Mobile Payments at Retail Point of Sale - An Indian Perspective http://www.marsland-journals.com/uploadfiles/AB16f420130708164238/B01780-lsj-	Research paper: Mobile Payments at Retail Point of Sale	Umesh Chandrasekhar ¹ , R. Nandagopal ²	2013	With over 800 mobile subscribers and nearly 41% of the population having little or no banking access, mobile payments (M-Payments) have a huge

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
part20130708.pdf				<p>potential in India.</p> <p>Availability of affordable handsets, low mobile tariffs and data network coverage across the country are key drivers for m-payments.</p>
<p>A Brief Survey of the Mobile Payments Landscape</p> <p>http://blogue.priv.gc.ca/information/research-recherche/2013/mp_201306_e.pdf</p>	Research Paper: Mobile Payment Landscape	Carlisle Adams	2013	<p>Motivation, privacy and security are major actors in the mobile payments ecosystem.</p> <p>Potential security or privacy risks and to consider ways in which these risks can be mitigated, if possible.</p>
<p>A Practical Generic Relay Attack on Contactless Transactions by Using NFC Mobile Phones</p> <p>http://www.informatics-society.org/IJRFIDSC</p>	Research Paper	Lishoy Francis, Gerhard Hancke, Keith Mayes	2005	<p>Relay attacks exploit the assumption that a contactless token within communication range is in close proximity, by placing a proxy-token in range of a contactless reader and</p>

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
/Paper%202.pdf				<p>relaying communication over a greater distance to a proxy-reader communicating with the authentic token.</p> <p>Security threat like implementation reduces the complexity of relay attacks and therefore has potential security implications for current contactless systems.</p>
Enabling evidence-based retail marketing with the use of payment data - the Mobile Payment Reference Model 2.0	Research Paper	Key Pousttchi, Yvonne Hufenbach	2013	Extends the mobile payment reference model (MPRM) with new business model elements and roles.
International Journal of Computer Science, Engineering & Applications. A MULTI-CHANNEL SYSTEM	Research Paper	Pavlovski, Chris	2013	Financial institutions have increased dependence upon the technology solutions that enable their financial products and services.

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
<p>ARCHITECTURE FOR BANKING</p> <p>http://web.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=22310088&AN=91981753&h=Hb3uEpJ%2fFRBo11byLhmsMBagm%2b6HauYlaiU0xeygFXygGQKMsFziM%2fzWnhNAcIdWhqmbztmEJbnJr7oM3adxNg%3d%3d&crl=c</p>				<p>Increased pressure from banking and financial institutions to ensure that competitive leadership is maintained in IT</p> <p>Highlights the importance of current business model and creating new ones.</p>
<p>A Model of Controlling Utilization of Social Grants</p> <p>http://link.springer.com/chapter/10.1007/978-3-642-39643-4_49</p>	Research Paper	<p>Computer Science Department, Faculty of Information Communication Technology, Tshwane University of Technology, Private Bag X680, Pretoria, 0001, South Africa</p>	1994	<p>This research seeks to design and implement a system that controls utilization of social grants using Near Field Communication technology. The results of this preliminary study shows that 62% of social grant recipients use their funds within a week, 82% within two weeks, and</p>

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
				92% within three weeks. Only 8% use the funds until the fourth week. New models of NFC and mobile payments can be used for disbursement of government benefits.
Mobile Payment http://download.springer.com/static/pdf/646/bfm%253A978-3-658-03251-7%252F1.pdf?auth66=1390279521_ab8b98bff0ca31294bf632146eaca9c9&ext=.pdf	Research Paper	Thomas Lerner	2013	Focus on reasons to believe that conditions on the market have indeed taken a turn for the better and that mobile payment services can be expected to gain momentum. India can take key points from the research done in other countries.
Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India	Research Paper	Rakhi Thakur, (S.P. Jain Institute of Management and Research), Mala Srivastava, (Narsee Monjee Institute of Management Studies)	2014	There is a relationship between adoption readiness, perceived risk and usage intention for mobile payments in India and to investigate the stability of proposed structural relationships

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
http://www.emeraldinsight.com/journals.htm?articleid=17102473&show=abstract				across different customer groups. Study the role of different factors on the mobile payments usage intention among customers.
A review of technology, tags, applications and security http://www.ijrcct.org/index.php/ojs/article/view/398	Review	Prasad Subhash HALGAONKAR, Sukmal Jain, V.M. Wadhai	2013	Major attacks are relay attack, eavesdropping, data insertion, data modification and denial of service (DOS). These attacks must be prevented for making NFC based application more secure.
Promoting Collaborative Mobile Payment by Using NFC-Micro SD Technology http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6649728&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.j	Research Paper	Szu-Hui Wu; Inst. of Inf. Manage., Nat. Chiao Tung Univ., Hsinchu, Taiwan; Chyan Yang	2013	(NFC) is a new short-range wireless communication technology that enabled simple, security and intuitive peer-to-peer communication between NFC-enabled devices. The advent of NFC has given rise to several interesting applications

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
sp%3Farnumber%3D6649728				<p>under short-range radio technology.</p> <p>Value chain is a collaborative solution. NFC mobile payment via NFC-Micro SD technology can be seen as the better mobile payment solution</p>
<p>Wallet-on-wheels — Using vehicle's identity for secure mobile money</p> <p>http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6670900&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D6670900</p>	Research Paper	Coneland, R.; Core Viewpoint, Kenilworth, UK; Crespi, N.	2013	<p>Mobile Money is growing in the developed world while cars are becoming much smarter. Combine the two - and you get cars that 'own' a wallet.</p> <p>Propose strengthening the authentication procedure further with the 'Twin-Set' (of 'Two-Factor') method using both car-based and SIM-based authentication, and the 'Twin-Step' confirmation method for service authorization.</p>

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
<p>Taming The Wild Card for Mobile Payment</p> <p>http://research.microsoft.com/pubs/193977/ubicomp2012.pdf</p>	Research Paper	<p>Mastooreh Salajegheh</p> <p>Bodhi Priyantha</p> <p>Jie Liu</p>	2013	<p>Slow adoption of contactless point of sales (POS) terminals by merchants limit the potential of Near-Field Communication (NFC) based payment devices. I</p> <p>Mobile wallets promise to allow people to easily manage their accounts and to carry less cards.</p>
<p>The Current State of NFC Payments in Finland</p> <p>http://theseus17-kk.lib.helsinki.fi/handle/10024/61757</p>	Research Paper	<p>Roland, Michael</p> <p>NFC Research Lab</p> <p>Hagenberg University of Applied Sciences</p> <p>Upper Austria</p> <p>Langer, Josef;</p> <p>Scharinger, Josef</p>	2013	<p>Explored what have been some of the factors slowing down the introduction of NFC payments to the consumers. Understand the perceived usefulness of the mobile wallet from a consumer's perspective</p> <p>Learn Google's approach</p>

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
				to solving the issue of software-based relay attacks in their recent releases of Google Wallet. maximum distance for NFC is 4 inches
Applying relay attacks to Google Wallet http://ieeexplore.ieee.org/xpl/login.jsp?tp=&arnumber=6482441&url=http%3A%2F%2Fieeexplore.ieee.org%2Fxppls%2Fabs_all.jsp%3Farnumber%3D6482441	Research Paper	Roland, Michael NFC Research Lab Hagenberg University of Applied Sciences Upper Austria Langer, Josef; Scharinger, Josef	2013	Several new attack scenarios, using NFC devices either as attack platform or as device under attack, have been discovered. One of them is the software-based relay attack
Developing and Validating a Scale for Perceived Usefulness for the Mobile Wallet	Research Paper	Debby Ho, Milena Head, Khaled Hassanein	2013,	Explore adoption models in this domain, they have taken a generic approach to understanding customers' perceived usefulness of this technology. I Find goal-oriented construct to understand

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
				the perceived usefulness of the mobile wallet from a consumer's perspective
Control of attendance applied in higher education through mobile NFC technologies http://www.sciencedirect.com/science/article/pii/S0957417413000729	Research Paper	Marcos J. López Fernández, Jorge Guzón Fernández, Sergio Ríos Aguilar, Blanca Salazar Selvi, Rubén González Crespo	2013	Improved attendance control system, required for continuous evaluation which has become compulsory following the Bologna Process Explores the possibility of NFC for m-commerce and e-commerce
Proposal of Micropayment and Credit Card Model using NFC Technology in Mobile Environments. http://web.ebscohost.com/abstract?direct=true&profile=ehost&scope=site&authtype=crawler&jrnl=19750080&AN=92606840&h=a0uslKoJudXh2ZkWktv0kGRUYJHhCJY	Research Paper	Sun-Kuk Noh; Dong-You Choi; HyeongGyun Kim; DaeKyu Kim; JaeHyun Seo; JongWon Kim; ByungRae Cha	2013	This paper proposed a micropayment model based on NFC and credit card model. Explores the possibility of NFC for m-commerce and e-commerce

Literature Reviewed	Literature Type	Author/s	Publishing Year	Gist of Points gained and Linkage to own research
vnZhWFmDs4L3ekv czdScm%2bNfDC6q WceBrPpir9dYrWXq jiZ918wWiKw%3d% 3d&crl=c				

Table 1 Literature review

As outlined in the table there is a lot of innovation happening which is revolutionizing the payment industry. Technology has not only enabled multiple channels like phone, smart phones, and handheld/wireless devices along with the traditional cards which give a tremendous impetus to the payment industry.

3.3:Origin and history of Plastic money

Money is a useful way of exchanging value and has been used for transaction after the barter system which was the first system of exchange of goods and services for humans. Various social and economic implications are affecting the use of money.

A look into the history we find the word “Money” has been derived from the Latin word “Moneta” which denotes the Roman goddess Juno in whose temple currency was minted (Crowther, 1972). During early ages of human civilization barter was prevalent with direct exchange of goods and services which is generally seen prominently in poor or economically backward nations. Barter system had its limitations where it was difficult to determine the exchange quantity for two products and suitable only to people in ages where the requirements of satisfied and healthy life was limited. The users of barter systems are mostly interested in basic amenities of life and it became more and more difficult to sustain with increase in human demands. The small and medium industrialization lead to the division of labor and the use of currency. Gold coins were the early forms of money where it served as a medium to store value and exchange.

Metallic money which was minted in a controlled manner is in practice since then; prior to this the bones like tusk of elephant and other medium of exchange were also used in the community. Emergence and the use of paper currency was useful and handy way to store value. After a while people started keeping credit history from small retailers which was converted into store’s credit coins and plates. Subsequently an idea cropped up to use a standard card in outlets which came in the form of diner card. The first credit card was issued in USA around 1958. With the advent of electronic transactions in 1973 and the use of authorization, it was clearly paving way for e-commerce. In 1976 visa was born and similarly MasterCard came into the mainstream. Thus cards came into prominence, morphed and proliferated into a variety of forms. Primarily cards are classified as debit and credit cards, and pre-paid cards are another form of debit cards. The more recent development is the EMV chip embedded in cards and the use of Virtual wallets which are doing the electronic transaction easily and on various electronic devices like mobiles.

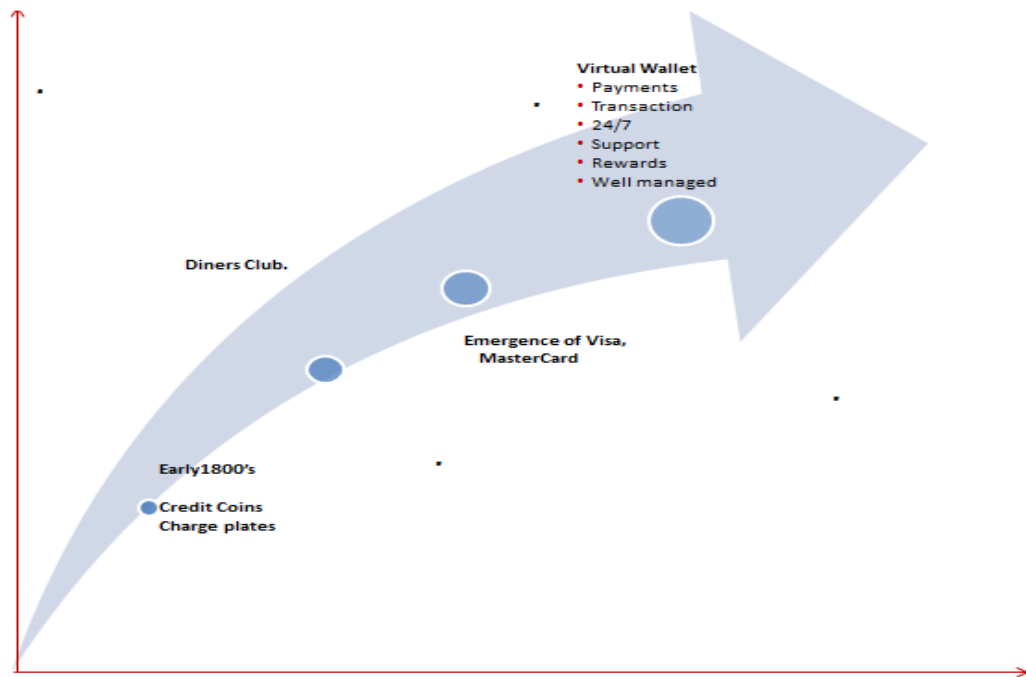


Figure 3 History of cards and wallet

Card based systems came into use because of the convenience and easy of completing a transaction. Traditionally Indian economy has been slow to adopt to the global changes and the slow adoption of technology resulting in the loss of business opportunity. The use of cards has more than convenience value and also contributes to the effective transaction across the economy. Plastic money offers closure of payments and issue of credit as required.

3.4: Credit Cards

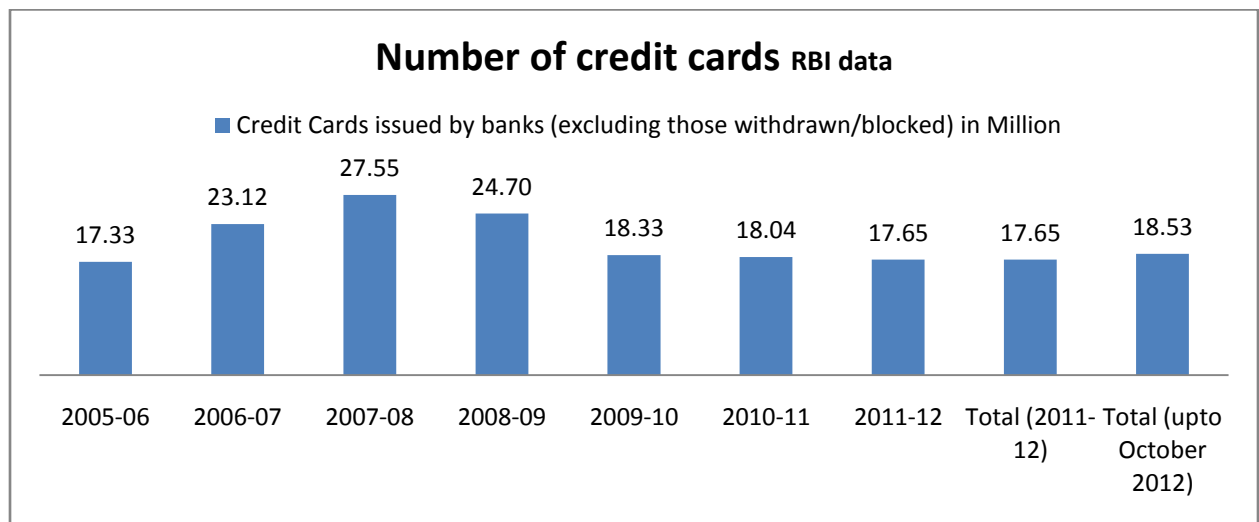
Credit cards are immediate user verified and authorized with delayed payment method. The customer has a preapproved credit limit and all credit purchases can be done up to this limit. The settlement is done within the settlement cycle which is generally one month. Some cards have a predefined fixed limit while others have a

flexible limit based on the ability to repay and the type of card. Most corporate credit cards have very high limits when compared with personal credit cards.

It is also easy to do this transaction for e commerce and the card details are sent over to merchants for the transaction.

Credit cards typically have multiple intermediaries like payer, merchant, acquirer and issuer. Payment is made by payer to the issuer while the acquirer pays the merchant.

The first debit card in the country was introduced by CITI in Bengaluru in the year 1987 and Central Bank of India was the first bank to introduce “central card” in 1980. Ever since the launch the credit cards the cards have shown impressive growth every year. By December 2014 the number of outstanding credit cards is 20 million as per RBI statistics and the number of debit cards for the same period is equal to 500 million [1]. Today India has a variety of credit cards but for different segments of users like classic, premium, travel and currency, fuel and corporate cards.

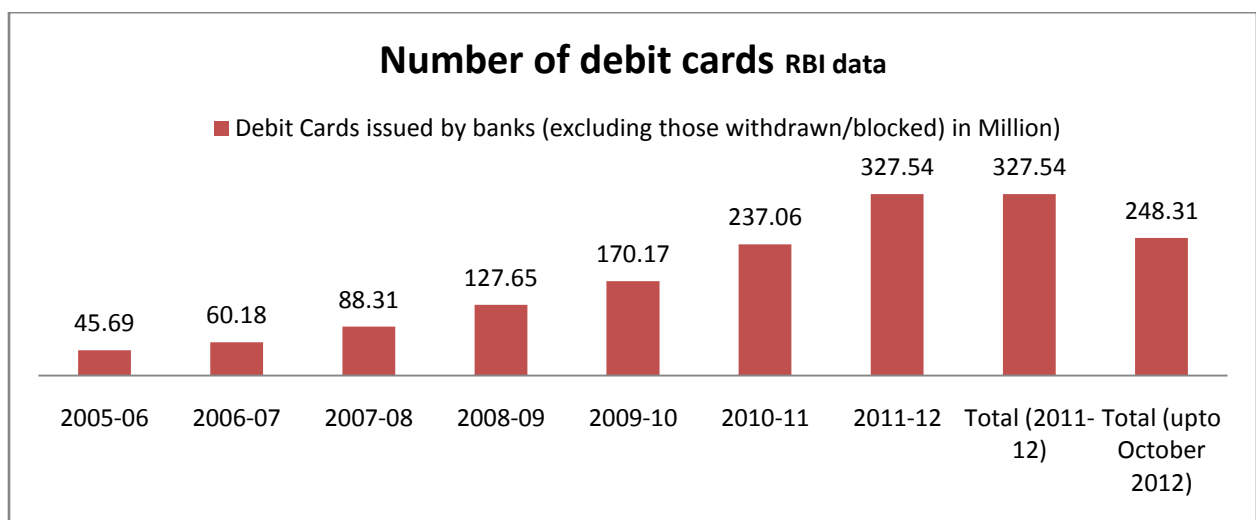


Card Details from RBI	Dec-13	Dec-14	Dec-15	Dec-16	Mar-17
No. of outstanding Credit Cards as at the end of the month	18686136	20362859	22748760	28321039	29842235

Figure 4 No of Credit Cards as per RBI data. The blue graph shows no of Credit Cards issued.

The graph above shows that the number of credit cards has not grown significantly over the years and this highlights little important socio economic condition in the country. Indian society believes in savings or there may be other reasons why the growth in credit card has not been tremendous over the years. The graph shows that the number of active credit cards had actually decreased in the year 2009 to 2010. This also highlights the impact of legal regulation and optimization done by government and banks which lead to tightening of the credit card industry.

Credit cards are convenient and lead to increase in GDP, the transactions are monitored for abnormalities and there is protection from many kinds of frauds. Still the credit card industry has not picked up in India.



Card Details from RBI	Dec-13	Dec-14	Dec-15	Dec-16	Mar-17
No. of outstanding Debit Cards as at the end of the month	372506779	500080855	643191224	761123366	854874586

Figure 5 No of Debit Cards as per RBI data. The blue graph shows no of Debit Cards issued.

The debit card story is definitely very lucrative in India with good YOY growth. The use of the debit cards in ATM and POS has increased the electronic fund payment system in the country. The rise of credit and debit cards is a positive signal for the nation and the “SPENDING SIGNAL” gives us an estimation of the Indian economy.

Cashless transaction enables transparency and accountability. Plastic money is a socio economic indicator in much respect and the research aim at getting a perception of the people in Bengaluru. One of the macroeconomic aspects that can be contained with increase in cashless transaction is black money. According to the statement of Central Bureau of Investigation in year 2012 there is \$500billion of illegal fund is stacked in tax heavens [2].

The latest advent of technology can decrease the cost of loans by using app's or by linking with Direct Carrier Billing of Mobile phone operators. This would bring down the cost of loan, KYC collection and also try to bring the unbanked population in the mainstream.

P2P payments are another emerging area which is bringing the small money transaction between like the once between friends and family under the electronic radar. This is an area where most of the transactions have mostly been non digital and are slowly moving to digital with virtual wallet services and mobile operator driven closed wallets in India.

Among the new emerging payment systems, the crowdfunding is an interesting one which enables many people to donate or put in money for a cause. The current plastic money industry does not have enough features to help in bridging the requirements of this new industry driven by crowdfunding and the accountability & taxation aspects of this new funding mechanism. The Paper indirectly aims at highlighting the aims and aspirations of independent India as a nation which is demanding more financial innovation like the rest of the world.

Payments would become mostly invisible in future for now there is one click payments which rely on the user data and user history information to weed out the spurious transactions from the good ones. This is possible via data mining and big data algorithms and is definitely a change in the landscape which would force the credit and debit cards to be more sensitive to payment conversion rates for e-commerce and m-commerce industry.

Point of sales in stores have also undergone radical change over the years and have moved towards electronic fund transfer using plastic money. These POS would have to evolve to incorporate near field payments, beacon technology and few other standards. This evolution of POS to support EMV card and a whole host of technology would make the stores better in the near future.

Small business owners and individual use the credit card as a source of financing and the EMI options on the credit card is a lucrative choice. This translates into additional growth for the country but in some cases this also leads to overspending and frustration when the banks levy charges on unpaid amount. This is the reason why many people discontinue the card as they find the credit card management a pain. My research aims at bringing out the pulse of masses and also suggest corrective measures.

Alternate lending models like Peer to Peer P2P, crowdfunding and online platform based business lending [4] is also stated to grow multi fold with the help of information technology and the advance is likely to speed up in the near future. Virtual wallets have a lot of untapped opportunity in this space as the virtual wallets and similar apps can do this more efficiently and cost effective way.

Remittance is predominant in the country as most of the city dwellers have a family or extended family in rural and urban areas of the country. Similarly, remittance is big for nonresident Indians and the NRI's help the country in earning precious forex.

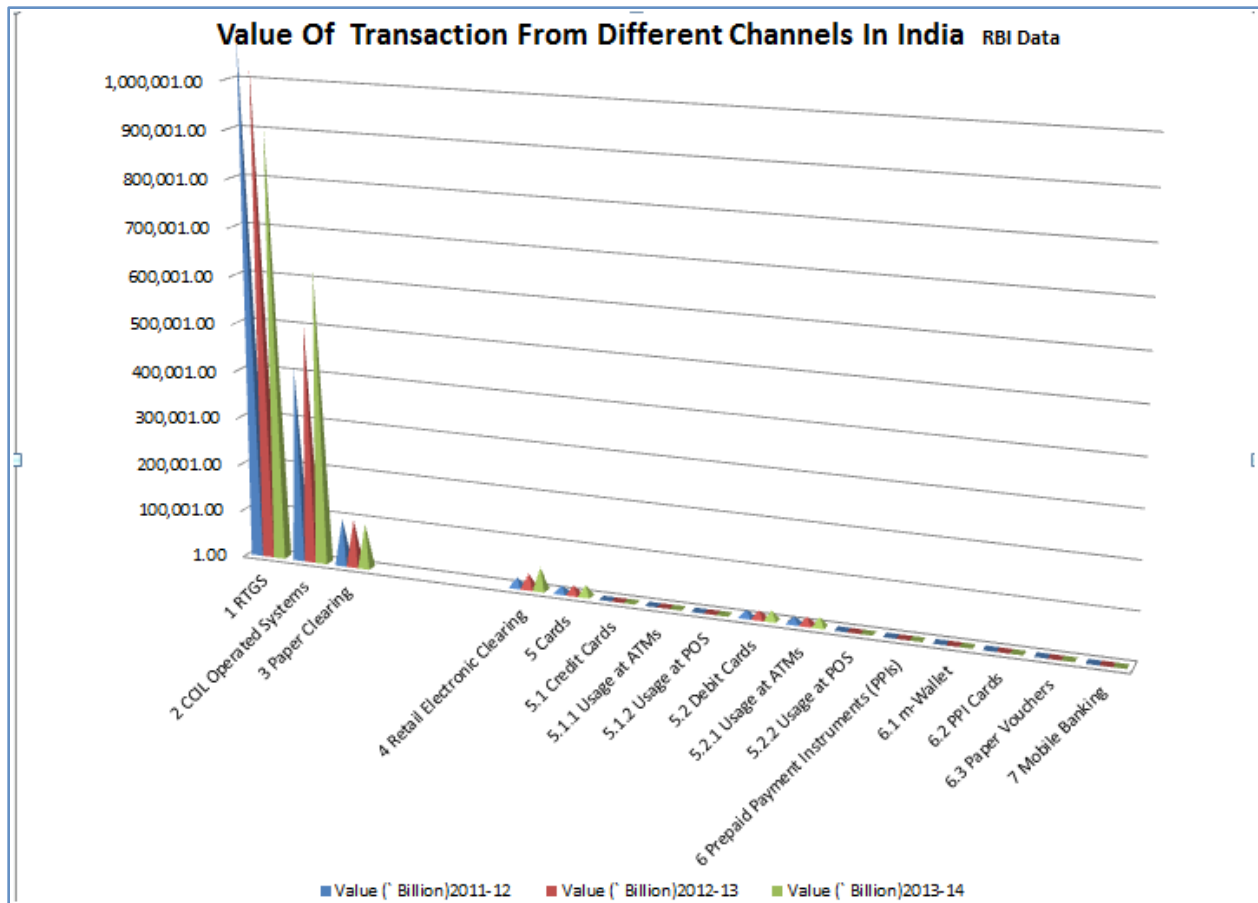


Figure 6 Value of transactions from different channels in India as per RBI data.

RBI Electronic Payment Systems - Representative Data (Updated as on April 18, 2017)										
Volume in million, Value in Rs. billion										
Data for the period	RTGS		NEFT		CTS*		IMPS*		NACH*	
	volume	value	volume	value	volume	value	volume	value	volume	value
Nov-16	7.9	78479.2	123.0	8807.8	87.1	5419.2	36.2	324.8	152.5	606.6
Dec-16	8.8	84096.5	166.3	11537.6	130.0	6811.9	52.8	431.9	198.7	626.8
Jan-17	9.3	77486.1	164.2	11355.1	118.5	6618.4	62.4	491.2	158.7	541.4
Feb-17	9.1	74218.8	148.2	10877.9	100.4	5993.9	59.7	482.2	150.5	592.0

RBI Electronic Payment Systems - Representative Data (Updated as on April 18, 2017)										
Volume in million, Value in Rs. billion										

Data for the period	UPI*		USSD**		Debit and Credit Cards at POS &		PPI #		Mobile Banking		Total	
	volume	value	volume in thousand	Value (in Rs. thousand)	volume	value	volume	value	volume	value	volume	value
Nov-16	0.3	0.9	7	7302	205	352	59	13	72	1244	671	94004
Dec-16	2.0	7.0	102	103718	311	522	87	21	70	1365	957	104055
Jan-17	4.2	16.6	314	381760	265	481	87	21	64	1206	870	97011
Feb-17	4.2	19.0	224	357055	212	391	78	18	56	1080	763	92594

Decimals removed in few column

RTGS – Real time gross settlement
NEFT – National electronic funds transfer
CTS – Cheque truncation system
IMPS – Immediate payment service
NACH – National automated clearing house
UPI - Unified Payments Interface
USSD - Unstructured Supplementary Service Data
POS – Point of sale
PPI – Prepaid payment instrument

Table 2: Latest RBI Electronic Payment Systems - Representative Data (Updated as on April 18, 2017) taken from Government of India's Site.

The chart above shows the RTGS value and value exceeds transactions via all other channel by a large measure. As India tries to embrace digital currency, it is important to increase the percentage contribution of mobile wallet and plastic money usage. As per the digitization agenda of the country India lags behind many other countries as there are many countries which have 90% to 100% coverage of digital payments.

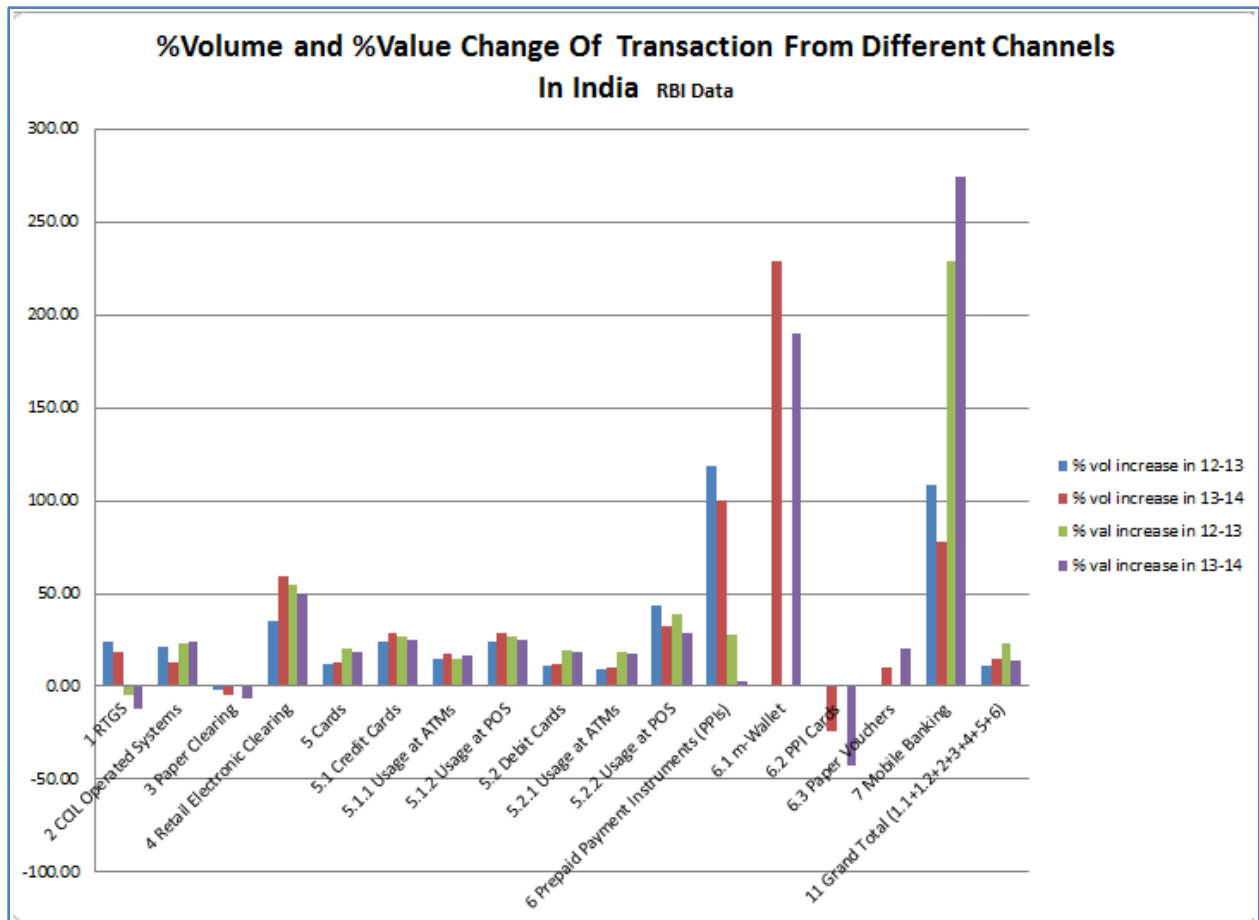


Figure 7 Volume and value of transaction in percentage as per RBI data

The chart above shows that the PPI cards and Paper voucher circulation have decreased over the year while mobile banking has shown phenomenal growth in recent years. Debit cards and credit cards have increased at a normal pace.

[1]

3.5: Debit Instruments

Debit card is a category of debit instrument which is similar to prepaid cards in some aspects. The amount is debited from account of the user immediately on purchase of commodity or services. For this the amount should be available in the user account.

3.6: Services and broad categories or types of payment and transactions

3.6.1: Prepaid Payment Services

In prepaid card services the amount is debited from the banking account of the user and can be used for payment later. The value is stored in smart cards, electronic form/ cash, bank cheque. Currently some of the mobile wallets like Airtel money, Paytm and others mobile money services fall under this category.

Some of these require both payer and payee to be online during the transaction while others do not.

3.6.2: Cumulative Collection Services

Cumulative collection services as the name suggest are made for accumulating the charges of the customers over time and billing the customer once during the cycle. The collection procedure can be used to make the customers life more convenient and the payment is done over a period of time. It is another delayed payment instrument. This does not require any credit or debit cards but usually there are other plastic money equivalent company cards and loyalty cards where the amount is accumulated over time. This avoids billing consumer's multiple times in the cycle. Any mobile operator also does same thing over time by collecting the bills and sending it after the payment cycle.

3.6.3: Payment Portal Services

These are intermediaries that have extended their services to mobile wallets as well. Their job is to provide a wide variety of transaction to the end customers. Users when they buy online are transferred the portal from where different payment choices are available. Once the transaction is successful the e merchant gets a confirmation and similarly the merchants and users get notification.

3.6.4: Mobile Phone Payment

Many systems have emerged from using the mobiles which have great computing power and user friendly screens. Several systems have been developed over to do

SMS, VOIP, USSD and mobile app banking where in a set of user inputs is taken over text, call, form inputs to initiate and complete a transaction. Some of these calls are protected using transport layer security, encryption, one-time password or multi factor authentication and variety of factors.

Reserve bank of India has allowed closed ended wallet services which allow limited transaction facility using mobile wallet / mobile applications.

To initiate such transactions payer has to identify using credentials, Phone number, geo positioning (Geo fencing) or using codes embedded in hardware for NFC.

Mobile payments can be done at manned and unmanned payment stores. In India the number of mobile users is higher than that of other electronic devices.

It is also possible to do P2P or peer to peer payments using mobile devices.

3.6.5: Online verses Offline

Payments which require a person and system to be available at the same time are known as online payment systems while those. Offline payments require special hardware to prevent malicious activity like resetting offline payment systems, hacking and tampering. A shared key infrastructure is generally helpful in offline payment systems along with tamper proof hardware.

3.6.6: Benefits of Electronic Payments

In India the value of electronic payments has increased more than cash transactions over the year and is gaining more prominence.

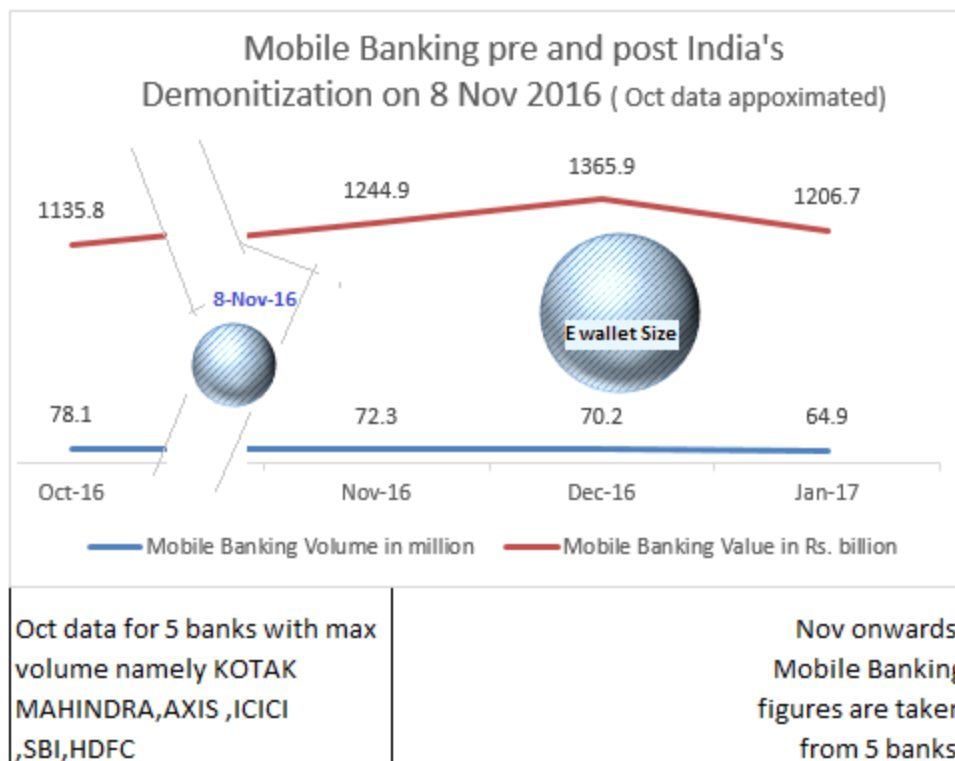


Table 2 Banking Statistics and Demonetization in India

With the emergence of e commerce, m commerce and online marketplaces the benefits of electronic communication and payments have gain more acceptances. Electronic payments are more secure, convenient and safe. Moreover, it can help in automatic accounting and tax collection activity over the years. Each of these measures increases the funds available with the banks and consequently increases the GDP of the country.

Data in table 2 is collected from NPCI statistics from RBI http://rbidocs.rbi.org.in/rdocs/ATM/DOCs/ATMPC072016267F1E02BD8C4CEAB9EBD19053506491.XLS https://rbi.org.in/scripts/Pr_DataRelease.aspx?SectionID=368&DateFilter=YearMonthhttp://rbidocs.rbi.org.in/rdocs/content/docs/EPS03122016_JAN.xls
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3.6.7: Unbanked and Technology

The mobile banking scenario in India is relatively undeveloped. According to the statistics India has more number of mobile subscribers but the usage of mobile banking is very low even though most of the banks now offer mobile and internet based services. The use of mobile banking technology has not seen the growth in India even though there has been a plethora of technological innovation in the recent era.

3.6.8: Financial inclusion and Banking

Financial inclusion drive by the new government in around the year 2015 has seen a lot of new account being opened but according to the latest news half of these accounts do not have funds and the cost of opening and managing accounts is high due to low deposit in the accounts opened by the lower section of society.

The recent drive by the government of India has earned a name in the Guinness world record but failed to be profitable.

3.7: Historical Development of Virtual Wallet

Virtual wallet is recent development in the last decade and has roots in the e-commerce which gained prominence with most user using online payment methods to purchase products and other services online.

Wallet is an electronic way of keeping card information and has evolved since then to include many features.

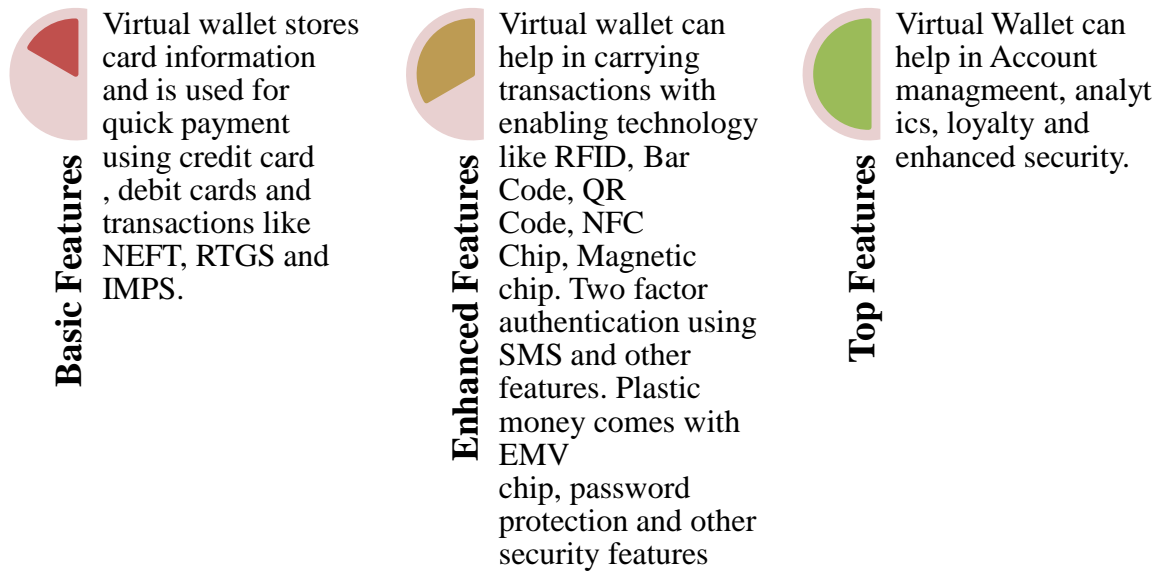


Figure 8 Wallet technology innovations and growing feature list.

Internet of Things (IOT) like smart watch, TV, fridge Etc. and payments are getting integrated in a seamless way to allow autonomous device to send and receive messages or make the payment scenario more seamless and easy which can be linked to the credit or debit cards. Some of these can make autonomous payment in the near future and would soon be linked with virtual wallets in one way or another.

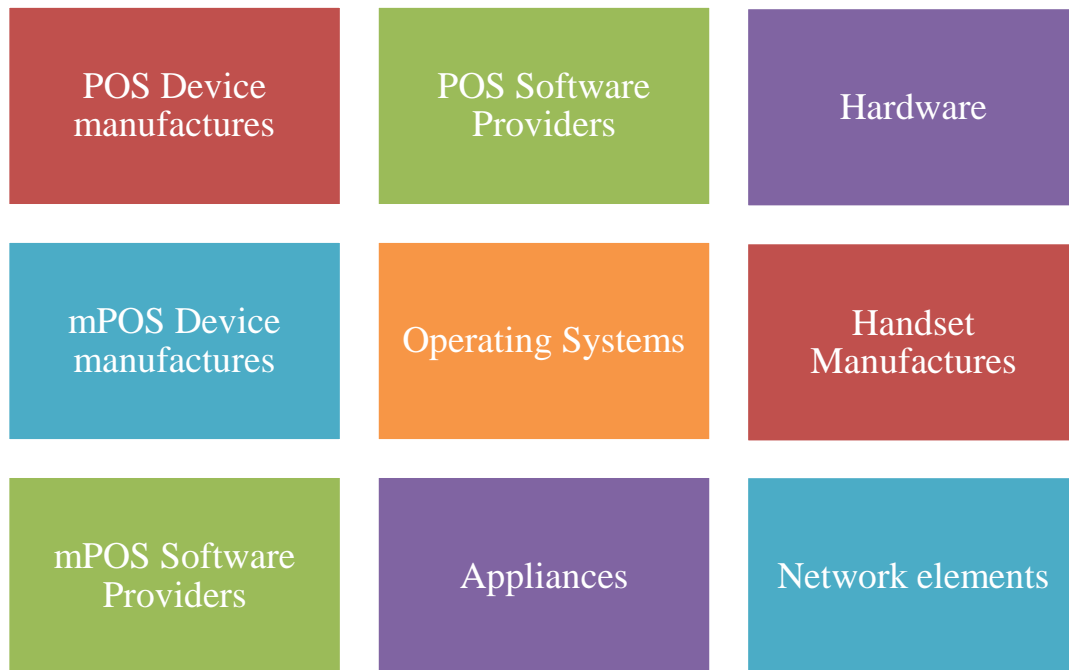


Figure 9 Virtual wallet technology is evolving due to innovation in the above fields

The growth of payment technology in India is impressive over the year and is expected to increase even more significantly in the near future. The business to consumer payments is called retail money and account for substantial of the card based transactions and this would increase with the use of virtual wallet technology.

Peer to peer payment or direct payment is also increasing along with business to business transactions. Other form of payments includes payment of taxes which also called administrator to consumer A2C.

The thesis covers mostly retail payments and so mobile wallet which is another form of electronic payment is mostly enumerated. Mobile wallet is supposed to be used for consumers using credit, debit or pre stored value like prepaid services. Some of the features are extended with the use of USSD which is carrier billing, beacons, near field communication to enable minimum effort transaction with high security.

Though all the features are sandwiched in mobile wallet technology but initially mobile wallet was aimed at being the electronic store of the card information which can be used for electronic transaction. The card values or equivalent token was stored electronically and thus it eliminated the need to carry physical credit and debit cards.

3.8: Research Gap

Paper by Limbu, Y. B., Huhmann, B. A., & Xu, B. (2012) studied college students and his paper titled “Are college students at greater risk of credit card abuse? Age, gender, materialism and parental influence on consumer response to credit cards” shows the effect of demographic factors on users but does not do the comparison between these payment modes. The research is for another geographic area and cannot be extended to other areas.

JOY, A. (2016) in his paper focuses on frequency of use of credit cards but does not extend the research to other cards or payment method. This paper does not cover the average spending as well when demographic factors are considered.

Dewri, L. V., Islam, M. R., & Saha, N. K. (2016). Behavioral Analysis of Credit Card Users in a Developing Country: A Case of Bangladesh studied the effect of another factors like discounts on card usage but the same leaves scope of research in debit cards and virtual wallets.

Ahmad, R. (2016). Credit Card Debt Management: A Profile Study of Young Professionals. This work studies the effect of bankruptcy on people and its effects. It also finds that young people are not aware of the impact of bankruptcy on future earnings. Similar study is missing for Bengaluru region where number of high income professionals live.

Chahal, H., Kaur Sahi, G., & Rani, A. (2014). Moderating role of perceived risk in credit card usage and experience link. Talks of credit card perceived risk in usage and the same can be extended for cards and wallets as well. Time payment pressure is a good measure to access the usage of cards but that does also indicate that users may

be extremely credit savvy and may be living beyond their means. A more moderate study across various cards and wallets can give a different perspective to think about.

Current paper focuses on cards and does not only focus on debt payment but takes an open minded approach to understand the cause and effect of user's perception.

1. Comprehensive list of factors are not identified for plastic money and virtual wallet.
2. Non Users have not been extensively studied in Indian and suggestions have not been provided based on the most critical contributing factors.
3. Impact of Demographic variables and various factors on usage of plastic money and virtual wallet has not been prioritized by the researchers in Indian context.

3.9: Summary

This chapter highlights the evolution of cards and mobile wallet. This also captures the amount of research work done in this field. Some of the early research work was put into practice with effective results and the amount of research has increased since then. Due to the advancement of electronic banking and payment systems, and the proliferation of banking and non-banking entities the amount of relevant data and research required by the industry can only increase.

Chapter 4: Wallet and cards recommended usage

Chapter 4: Wallet and cards recommended usage

4.1: Overview

This chapter shows the different types of cards available in the market and the current perception about the cards. Intended and recommended usage patterns associated with plastic money and virtual wallets with the advent of new technology. This would be useful to set the correct expectation and compare it later in the survey. The following categories would be documented for this study.

1. Economic factors like Growth and Saving.
2. Technical factors that determine use of these instruments.
3. Demographic factors like age and how it affects the usage and adoption of cards.
4. Perceptions factors like security, ease of use, convenience
5. Education and awareness about the use of these instruments that affect the use.

4.2: Types of cards

The broad category of cards available in market and most of them can be classified under the following categories as given below. Each of these categories have specific features which makes them lucrative to particular segment of users

based on his choices and priorities.

CARD TYPE	BEST FEATURES
TRAVEL	Good for airline travel and vacation plans
CASHBACK	For Shoppers. Immediate reward.
REWARDS	For Shoppers and bill payment. Accumulates value
BUSINESS	High value transaction and higher credit limit
FOOD	Every day purchase and lifestyle
CORPORATE	Tailormade features for target segments. High credit limit
FUEL	Good for everyday commute
LIFESTYLE	Good for getting offers and Lifestyle gifts

Figure 10 Maps the major card types with the best features

The above features are not quite explained to buyers while they opt for the cards but users should be aware of the various advantages to make the best use of their cards.

Similarly debit cards also have a wide variety of choice and reward users based on their preference. In India both private and public sector banks have a variety of debit card choices which offer different Activation deposits, minimum balance, daily withdrawal limit and rewards. Some of the major categories of rewards are given below.



Figure 11 Major card reward category.

Virtual wallet has been recently launched in India and offer similar variety of rewards, minimum balance and daily withdrawal limit.

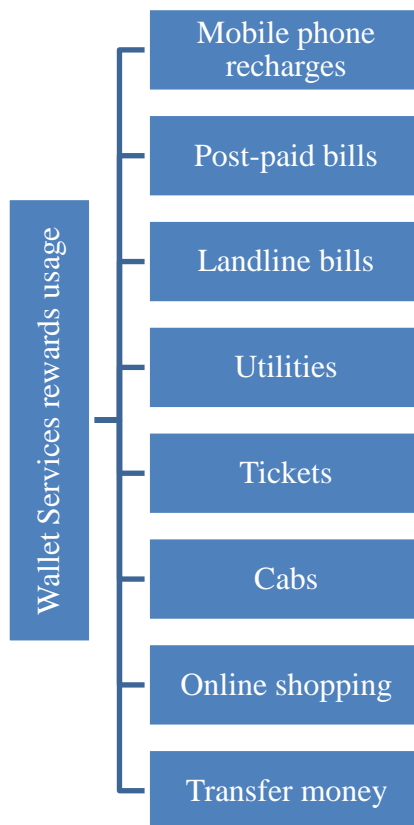


Figure 12 Major card usage categories.

4.3: Card Use studied by Researchers (Spending beyond means)

Plastic money and virtual wallet should be used with discretion as the wrong usage not only affects the user and his perception but also affects the provider in the long run. **Scott, R. H. (2007).** Credit Card Use and Abuse: A Veblenian Analysis. The study of the huge amount of consumer credit card debt in USA and concluded that the users are spending beyond their means. **Stephen F (2007)** in his research work, “Personality and credit card misuse among college students: The mediating role of impulsiveness” showed the negative impacts of the misuse of credit cards and how long term impact is not good for the card issuers. It studied the personality traits that affect card usage.

Based on general guidelines the following can be the intended recommendations for different factors.

4.3.1: Economic factors like Growth and Saving

Credit cards are good to build credit history and reflect the same in credit scores but there are few other factors that would determine what you do with your credit card and when it is better to use debit card over credit card. One such factors is the Annual Percentage Rate called APR in which the interest rate is calculated on the yearly outstanding and based on this an interest rate is charged for balance carried after the due date. Sometimes it looks low on a monthly basis but a APR of 3 percentages a month turns out to become 43 percent annual interest. [1]

Category	Debit Card	Credit card	Virtual wallet	
Annual fees	No in most cases	Yes	Yes, in most cases or indirect cost.	Mobile Banking Is now changing in India before and after the arrival of payment banks in India which are completely mobile. So this category needs to be revisited every year due to market dynamics.
Require Minimum Account Balance	Yes	No	Yes/No	
Withdrawal Limit	No if not restricted	Yes	Yes	
Require Approval	Preapproved	Yes	No as currently no credit is provided	
Cashback	As per card type	As per card type	As per the plan	
Rewards	As per card type	As per card type	As per the plan	
Transaction charges	Low or Nil	Yes	Low or Nil	
APR=Annual Percentage Rate	No	Yes	No as currently no credit is provided.	

Figure 13 Comparing Plastic money and wallet

The choice of card clearly shows why Indians have a preference for debit purchases as it shields them from overspending, transaction charges and high Annual percentage rate. Thus the usage of debit card is justified in India where individual saving rate is high.

[1] APR definition and data taken from http://www.moneycontrol.com/glossary/credit-cards/annual-percentage-rate-apr_58.html

Category: Users	
Action	Reason for having cards (Top reasons)
No	Reason
1	Ease of use
2	Convenience
3	Security (as people do not have to carry so much money)
4	Cash is not lying idle and can earn the savings bank interest.
5	Credit cards give immediate access to money without paper work and thus translates into savings.
6	Education that leads to financial literacy and help in savings.

4.3.2: Technical factors that determine use of these instruments

There are emerging technical factors that determine the choice and usage patterns. New near point communication patterns like NFC, Bar code, RFID and QR readers gives direct inputs to mobile devices and thus make the use of mobile wallet a natural choice to close the payment immediately. But there are others which connect these apps to mobile and with a card reader the credit or debit card can be used for payment. In case of such scenarios users generally have new virtual wallet technology handy as compared to plastic money.

In some cases, the currency is not really money and can be a bitcoin or virtual coins Etc. which does not use the conventional credit and debit card for closing a transaction.

So it is good to use virtual wallet with a virtual account service and then may the payment later using credit or debit card. In these cases, the credit card is advised to put a cap on the automatic paid amount.

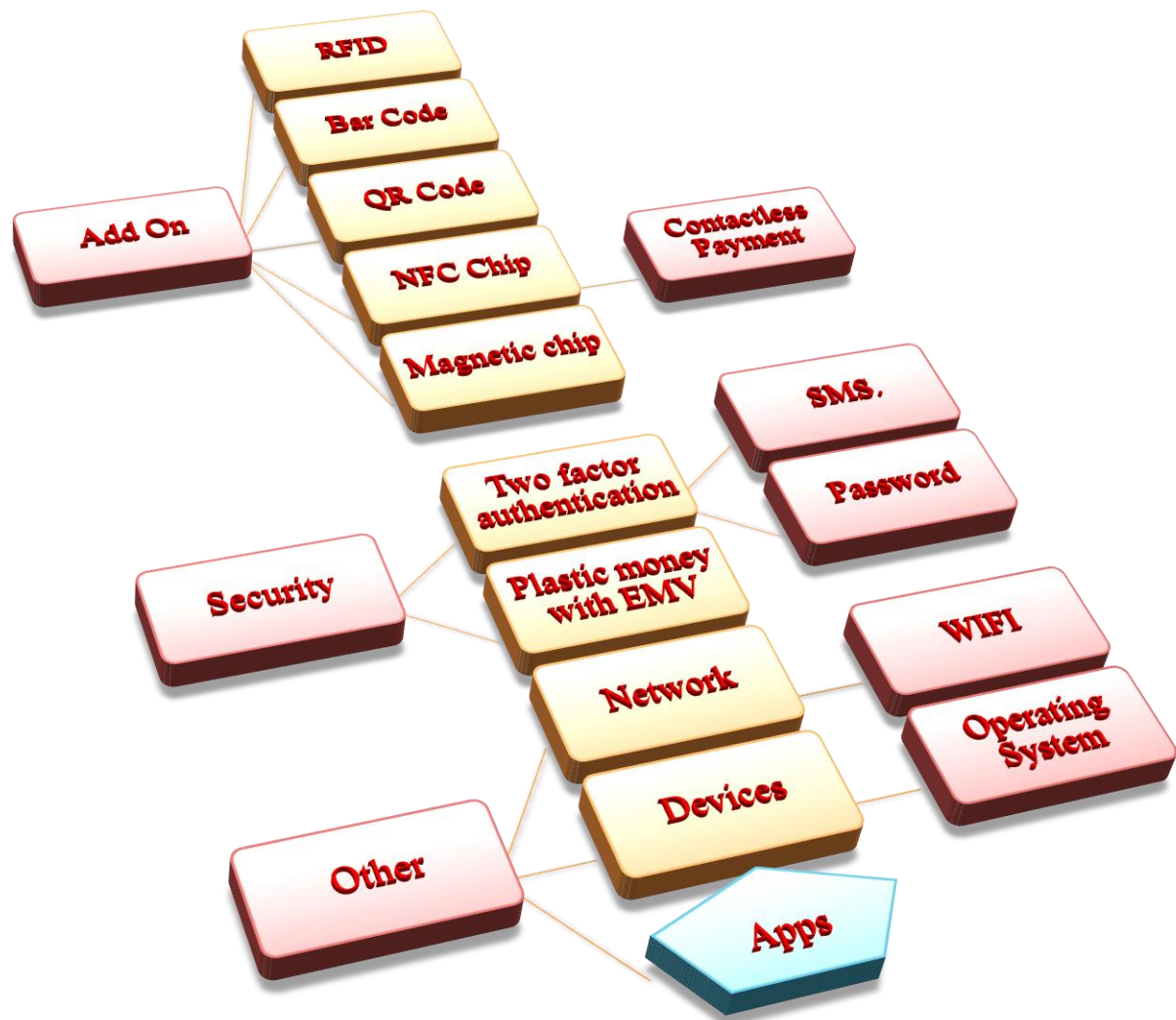


Figure 14 Technical components of the wallet ecosystem

4.3.3: Demographic factors like age and how it affects the usage and adoption of cards.

Perception of the users and the change in choice makes user used credit and debit. Most of the people in early age live on credit and have less choices and avenues to make a fortune. With the advancement of age, it is expected that users may prefer debit as they accumulate the savings over their lifetime. This is applicable more so in India where the credit cards are issued after lot of checks and the savings accumulated over time may make users more inclined to use debt instruments.

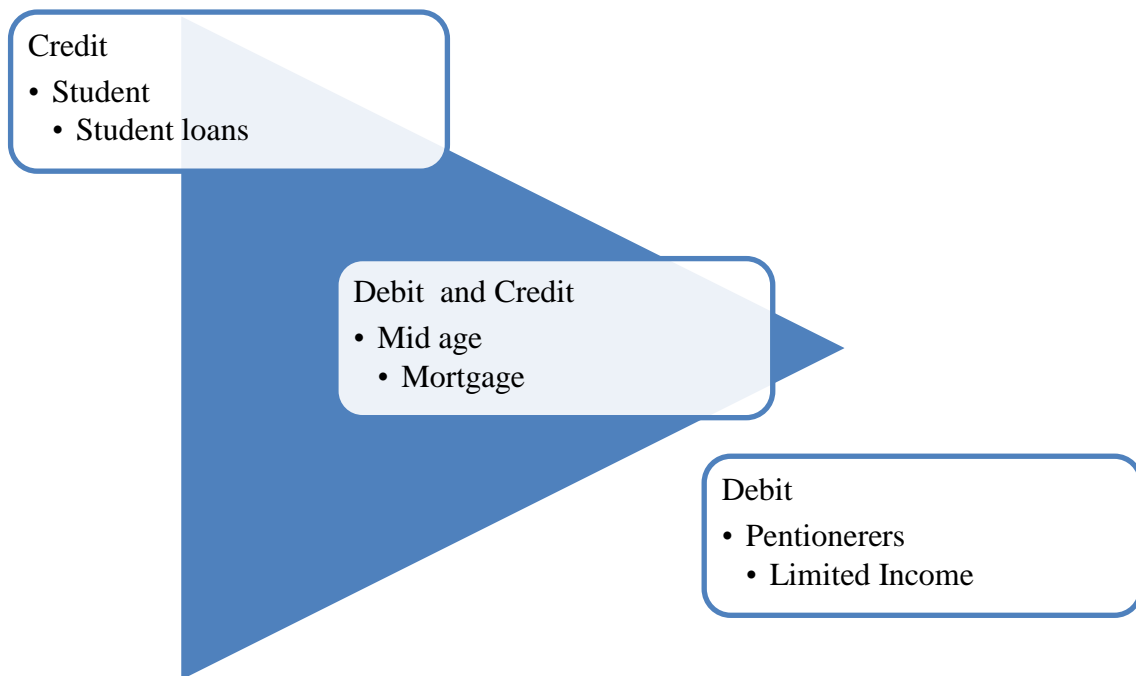


Figure 15 Affinity of cards with relation to age and major financial characteristics

Generally, the usage with age changes from credit at the early stage of life to debit at a later point of time with age.

4.3.4: Perceptions factors like security, ease of use, convenience

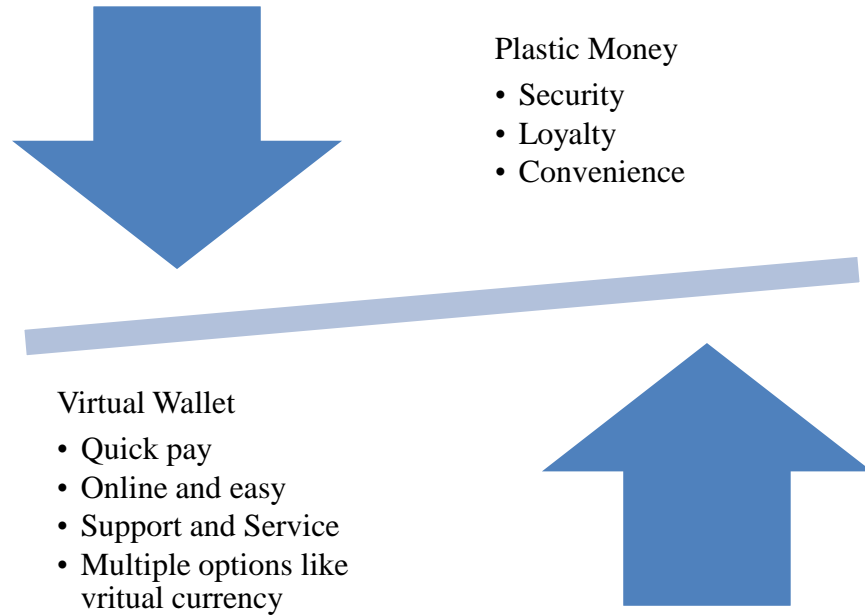


Figure 16 Difference in the perception of users while using the financial instruments.

The perception of users while using the financial instruments differs because of various factors like the use of technology. Plastic Money is a small currency that can be carried easily and identifies the users so the critical factors that determine the security is the use of different sets of information.

1. Information stored in card or plastic money
2. Information set by user of the plastic money like pin
3. Information provided by the card provider and punched during transaction like the CVV no.

Loyalty of plastic money is dependent on the usage while convenience factor is linked with the usage of cards.

Virtual wallet is evolving fast with technological improvement. The way the wallet technology is used ensures that the money is easily transferred via electronic fund transfer.

4.3.5: Education and awareness about the use of these instruments that affect use

Education and awareness should have a positive impact on the usage and adoption of the payment instruments. Educated user makes most effective use of the instruments and feels comfortable using new technology. Awareness is also important as old users know more ways of using the cards and also knows more features in mobile wallets.



Figure 17 Chain of factors that lead to the creation of reliable service

It is normally expected that the education leads to awareness and gives confidence to the user to explore and use new facility and instruments. An informed user not only does the right things but also does the things right and thus adds to the reliability of the overall service.

In absence of any of these enabling factor's it is more like to lead to improper or misuse of the financial instruments and also adds to overall risk in the system.

4.4: Summary

The chapter lays the underline expectations while approaching the research topic and would be used as a baseline to access the data collected during survey. The baseline also points out to the difference in the characteristics while evaluating plastic money and mobile wallet technology. Both plastic money and wallets are used for money transaction but they are radically different in terms of key characteristics and expectations from the user differ a lot while using these instruments. The perception and expectation of users differ while using these instruments differs and can be captured in the survey.

Chapter 5: Research Design and Methodology

Chapter 5: Research Design and Methodology

5.1: Overview

This chapter focuses on data and research methodology. It highlights the use of statistics to test research hypothesis and assumptions done during the course of research. The chapter discusses the rationale used while drafting the questions for sample study and the differences in questionnaire for Plastic Money and Virtual Mobile Wallet. The survey explored the unexplored area comparing the users of Plastic Money and Wallet.

Awareness about the conditions of card holders, services and security measures has been ascertained during the survey. The popularity of the cards and wallet is also an important factor that would contribute to the overall growth of different kinds of electronic modes of payments and electronic services offered to the user.

Additional benefits of cards relate to shopping convenience, loans and disbursements in the form of credit and debit facility, safety and recordkeeping.

Currently acceptability of mobile wallet payment is limited at outlets though Paytm has increased acceptance at many outlets. But the wide acceptability of wallets is still required to gauge the correct impact of wallet on payments services. The current effort captures the data set considering the limitations of the system.

5.2: Data

Data was collected from both primary and secondary sources. Data on the use of plastic money and virtual wallet was done by two different questionnaires which are similar in nature and constitute the primary data source for this research. Pilot test was carried out using a set of questionnaire.

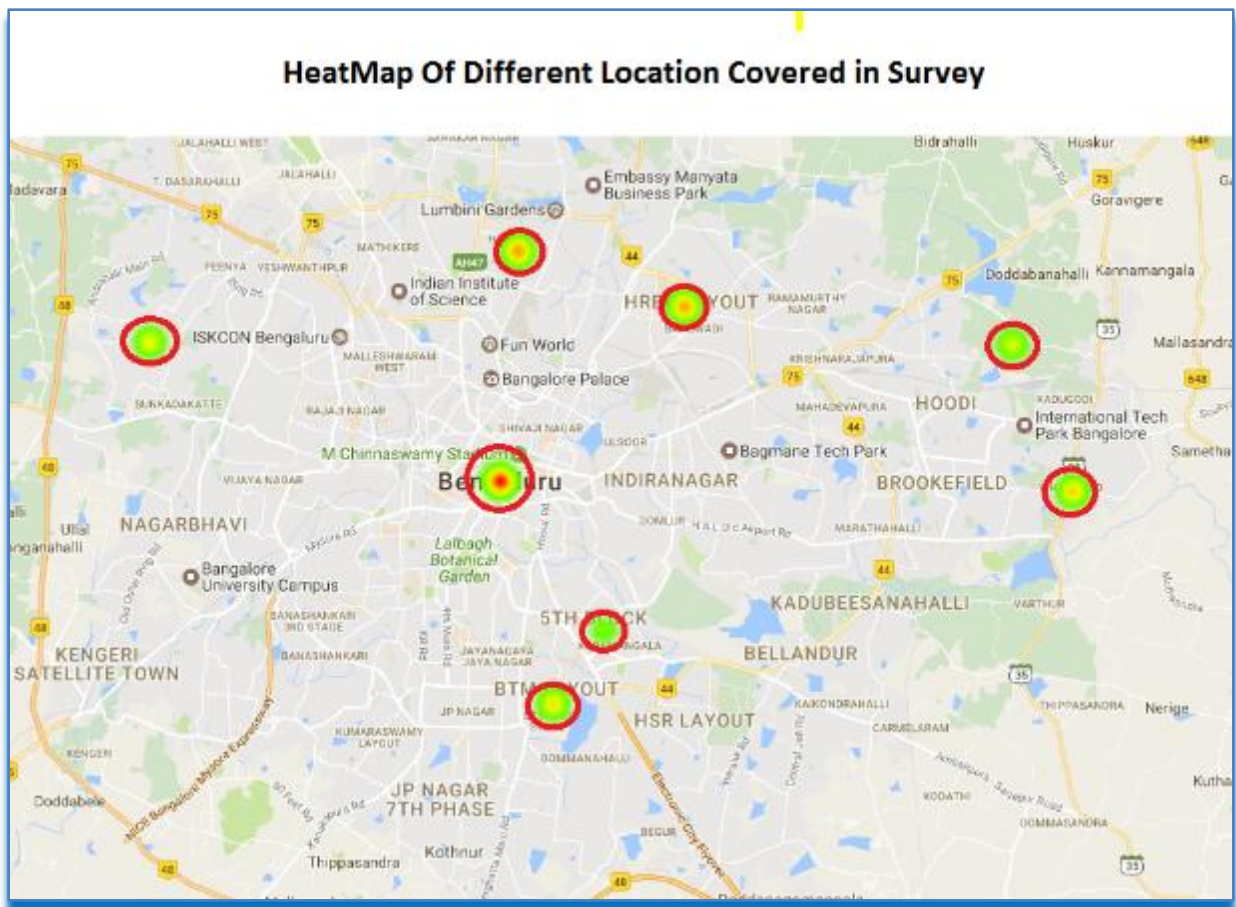
The questionnaire is well structured and starts from collecting the user's demographics, then user usage and perception on plastic money and virtual wallet. The questionnaire was devised after working out the various surveys and literary

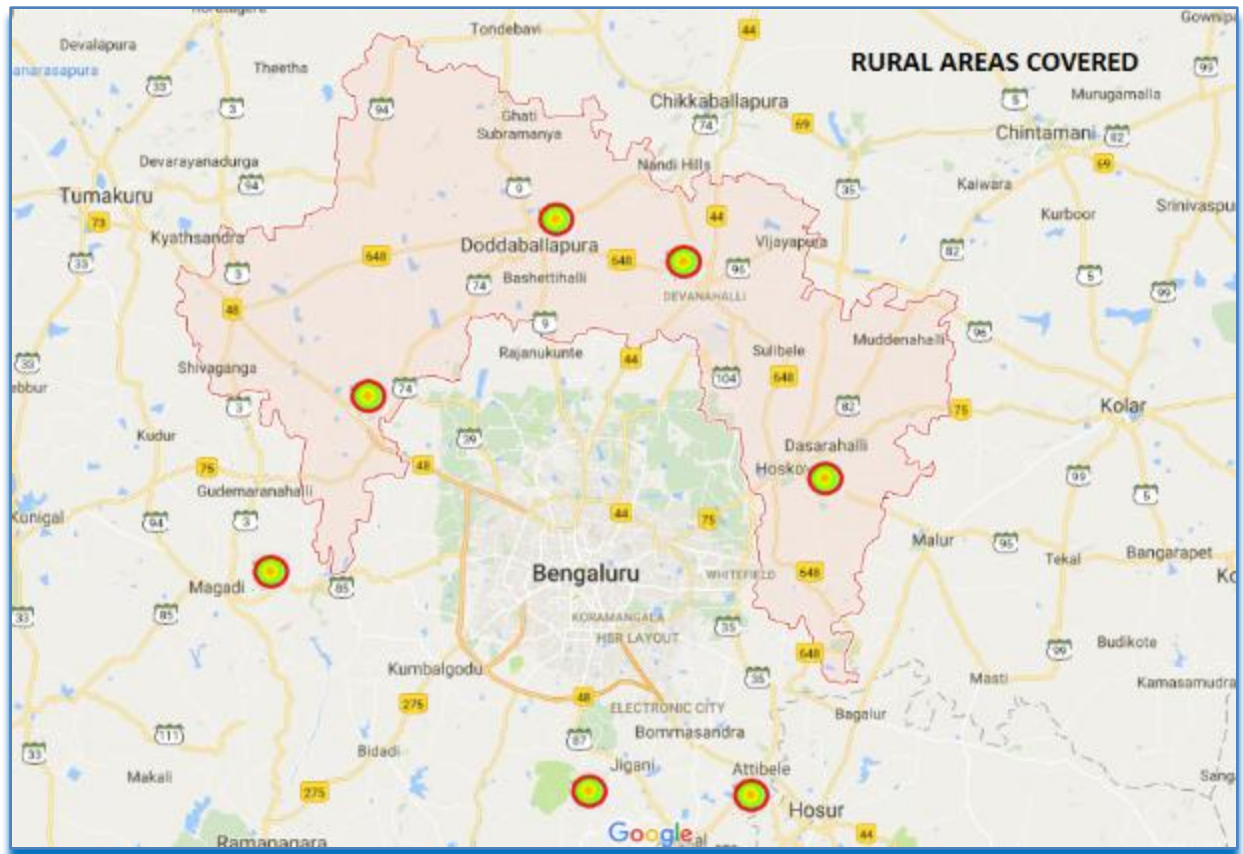
contents. The central idea was to use the data collection to bring out the usage and preferences of customers and non-customers. The result of the pilot was used for to carry out the survey on a large number of participants.

During the survey it was evident that the users had very different expectations from the plastic money and wallets so it would not be great to draft nearly same set of questionnaire from the respondents. Wallets is new and it is difficult to gauge people responses as most of the people are not aware of the features and definitely most people are not experts at using this new technology.

Acceptance was a challenge and it was also evident while collecting user responses for it was hard to get people to response on wallet survey parameters.

The data was collected from various general public has been used extensively to arrive at the impact factors.





understand the expectation of potential users as well. Objective questions and five point Likert scale was used to capture the survey data.

Demographic factors and the responses were captured using a combination of subjective and objective questions. Data collected was nominal, ordinal and five point Likert scale. Data also included radical questions like who uses your card aimed at drawing indirect reference that would give a hint of how the card is used or misused and also some insight into the way users manage their personal information. Some of the data set is different and trying to collect data set be directed and inference rather than asking question of binary nature which are sometimes not answered truly.

5.4: Data processing and analysis

On collecting the data set was cleaned to detect errors and aberrations. Analysis was done to compute measures, data pattern, relationship between variable, identify factors in the data groups.

Conflicting data is subjected to the statistical test to find the significance. Editing was done to ensure that the data is accurate to exclude minor human errors and aberrations or large deviations in data. Data is arranged in homogeneous groups and for easy analysis and display. Graphs and charts are prepared for the easy analysis and interpretation of data.

Nominal and ordinal data set was collected during the questionnaire. Inferences can also be drawn from indirect/direct answers where participants are new users of the system like mobile wallets. Using multiple approach can give us insight into the human nature and user behavior as these financial instruments are more often used with family members as was evident from the survey. India is unique and so is Bengaluru in many ways. The city is multilingual, multicultural and highest tax collected from salaried individual who leads to thinking that the attitude and perception of the masses towards use of cards and wallets would be different nature. To capture this aspect some question asked are an indication of the preference of the user and then the actual user preference is captured by asking direct question on security or preference.

Responses are categorized into appropriate category and then analyzed using statistical methods. Aberration are removed for consistency where necessary. Other times the data is normalized to compare plastic money and mobile wallet data summary. Normalization is done after considering the fact that the Plastic Money is much more mature in terms of wide variety of security measure, acceptability and other facts. Plastic money has been around for 60 years where as wallet technology is less than five years. More recently there are new entrants in the market which play a critical role in the setup and so the data has to be normalized to draw reliable inferences.

A large number of factors and variables have potential to affect user perception and acceptance of plastic money and mobile wallet. The data was appropriately group to find the following key influencing factors and the impact of those variables in the growth and adoption of plastic money and mobile wallet.

1. Economic factors like Growth and Saving.
2. Technical factors like features that determine use of these instruments.
3. Demographic factors like age and how it affects the usage and adoption of cards.
4. Perceptions factors like security, ease of use, convenience
5. Education and awareness about the use of these instruments that affect the use.

The data is drafted and tabulated on which the statistical analysis is carried out.

Basic Statistics like Mean has been used.

Inferences and conclusions are arrived using the following statistical analysis tools like.

1. Descriptive statistics
2. Correlation
3. Chi-Square Test
4. F-test for two sample variances

5. Principal Component Analysis

Models

1. Technology Acceptance Model

Descriptive statistics

Descriptive statistics is used to calculate the basic statistical information like mean, median and mode along with the standard deviation information for the data set. This data is used to find the subtle differences in data set between Plastic money and Wallet even though the average data set are comparable it is important to analyze the differences between the variable to find out the finer aspects of given data.

Descriptive statistics is used in this research to find the differences between the spending habits mobile wallets as well as plastic money users. This is useful to find out hidden patterns which are not normally evident from the overall perspective. One example is the highlight of spending one time in shopping using plastic money which gives the cute nature to the entire statistical figure.

Correlation

The degree of association between two variables is used to identify the most important variable which has high association with the dependent variable. The correlation coefficient is calculated to arrive at appropriate values of selected and dependent variables. The significance of the variable is also calculated using which further analysis and inference can be drawn. Correlation is used to find the relations between the demographic factors themselves in the survey. Various inter dependencies between age another factors like education can we study to find hidden flu in the data set. Significant positive and negative correlation would mean that is democracy factors are interrelated either positive or negative way. It's such a correlation exist it would probably be possible to draw for the predictive mechanism for virtual wallet as well as plastic card.

Chi-Square Test

Possession of plastic money or wallet and its influence on the various demographic and user variables is studied using Chi Square Test. This test is used extensively in the survey to find out or test the hypothesis and arrive at results any significant value can be used to determine if a hypothesis is true or false both in the case of mobile wallet and plastic money. This test is carried out for virtual wallets as well as plastic money separately for five factors age education etc.

F-test for two sample variance

F-test for two sample variance is calculated on data set to arrive at equal and unequal variance values for the data set. This method is used to find out if the data collected has equal unequal variance. The variance is calculated for both mobile wallets as well as plastic money. Helps in further analysis using T test.

Principal component analysis (PCA)

Wiki explains Principal component analysis (PCA) is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components.

Principal component analysis (PCA)

Principal component analysis (PCA) is a statistical way to transform and reduce the number of dimensions through orthogonal transformation. This helps in the identification of top contributing factors and data set that stands apart from the rest of the data.

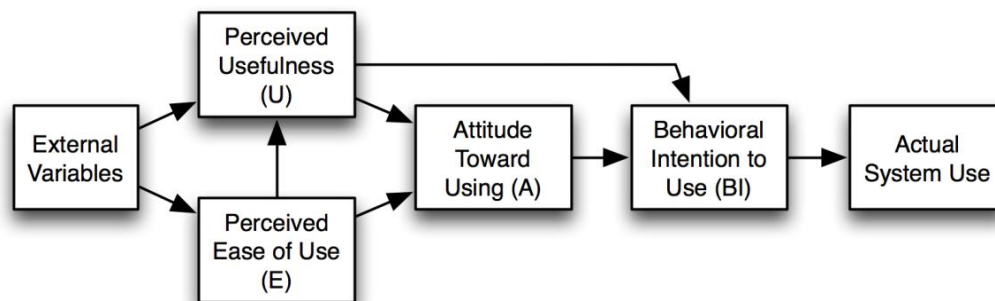
Technology Acceptance Model (TAM) theory in adoption of new IT innovation lays emphasis on perceived ease of use and usefulness and compares the same against actual use. In this case the perceived usefulness and method of use differs for virtual wallet and plastic money.

TAM is model for an information systems theory that evaluates the user's inclination to accept or reject a new technology. Developed by Davis, F. D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology" this model checks external variables like **Perceived usefulness** (PU) which identifies how the new technology enhances productivity and **Perceived ease-of-use** (PEOU).

Both these factors Factor affect the **Attitude** and **Behavior** which ultimately impacts the actual use of the system.

- Davis, F. D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology "
- Davis, F. D.; Bagozzi, R. P.; Warshaw, P. R. (1989), "User acceptance of computer technology: A comparison of two theoretical models"

- Perceived ease of use
- Perceived usefulness



Source: WIKI

Figure 19 Technology Acceptance Model

Technology Acceptance Model (TAM) F-test for two sample variance

TAM as an information systems theory that models how users come to accept and use a technology.

5.5: Hypothesis of the study

Hypothesis is the principal baseline on which the research is carried out. The strategic decision making is based on analysis of the null hypothesis. In light of the study objectives the following hypothesis is tested. To do usage of plastic money and virtual wallet as modes of payments in and around Bengaluru City.

Category: Plastic Money	Category: Virtual Wallet
Significance Level 0.05	Significance Level 0.05
To assess the level of usage, spend and awareness about features among the users	To assess the level of usage, spend and awareness about features among the users
Hypothesis Statement	Hypothesis Statement
Variables: Gender	Variables: Gender
Hypothesis HP10: Plastic Money use is not influenced by gender.	Hypothesis HW1 ₀ : Gender <u>has no influence</u> on how many times virtual wallet is used.
Hypothesis HP1a: Plastic Money use is influenced by gender.	Hypothesis HW1a: Gender <u>has influence</u> on how many times virtual wallet is used.
Hypothesis HP2-0: Spends of Plastic Money is not influenced by gender.	Hypothesis HW2-0: Spends of virtual wallet are not influenced by gender.
Hypothesis HP2a: Spends of Plastic Money is influenced by gender.	Hypothesis HW2a: Spends of virtual wallet is influenced by gender.
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by gender.	Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by gender.
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by gender.	Hypothesis HW1a: Awareness about features of virtual wallet is influenced by gender.
Variables: Education	Variables: Education
Hypothesis HP3 ₀ : There <u>is no association</u> between education and high usage of card.	Hypothesis HW3 ₀ : Education has <u>no influence</u> on the preference for particular type of wallet.
Hypothesis HP3a: There <u>is association</u> between education and high usage of card.	Hypothesis HW3a: Education <u>has influence</u> on the preference for particular type of wallet.
Hypothesis HP40: There is no association between education and Spends of card.	Hypothesis HW4-0: Spends of virtual wallet are not influenced by education.
Hypothesis HP4a: There is association between education and Spends of card.	Hypothesis HW4a: Spends of virtual wallet is influenced by education.

Hypothesis HP10: Awareness about features of Plastic Money is not influenced by education.	Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by education.
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by education.	Hypothesis HW1a: Awareness about features of virtual wallet is influenced by education.
Variables: Occupation	Variables: Occupation
Hypothesis HP50: Plastic Money use is not influenced by occupation.	Hypothesis HW5 ₀ : Occupation <u>has no influence</u> on how many times virtual wallet is used.
Hypothesis HP5a: Plastic Money use is influenced by occupation	Hypothesis HW5a: Occupation <u>has influence</u> on the preference for particular type of wallet.
Hypothesis HP60: There is no association between occupation and Spends of card.	Hypothesis HW6-0: Spends of virtual wallet are not influenced by occupation.
Hypothesis HP6a: There is association between occupation and Spends of card.	Hypothesis HW6a: Spends of virtual wallet is influenced by occupation.
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by occupation.	Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by occupation.
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by occupation.	Hypothesis HW1a: Awareness about features of virtual wallet is influenced by occupation.
Variables: Age	Variables: Age
Hypothesis HP70: Plastic Money use is not influenced by age	Hypothesis HW7 ₀ : Age <u>has no influence</u> on how many times virtual wallet is used.
Hypothesis HP7a: Plastic Money use is influenced by age	Hypothesis HW7 _a : Age <u>has influence</u> on how many times virtual wallet is used.
Hypothesis HP80: There is no association between age and Spends of card.	Hypothesis HW8-0: Spends of virtual wallet are not influenced by age.
Hypothesis HP8a: There is association between age and Spends of card.	Hypothesis HW8a: Spends of virtual wallet is influenced by age.
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by age.	Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by age.
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by age.	Hypothesis HW1a: Awareness about features of virtual wallet is influenced by age.
Variables: Marital Status	Variables: Marital Status

Hypothesis HP90: Plastic Money use is not influenced by marital status	Hypothesis HW9 ₀ : Marital Status <u>has no influence</u> on how many times virtual wallet is used.
Hypothesis HP9a: High plastic moneys use is influenced by marital status	Hypothesis HW9 _a : Marital Status <u>has influence</u> on how many times virtual wallet is used.
Hypothesis HP100: There is no association between marital status and Spends of card.	Hypothesis HW10-0: Spends of virtual wallet are not influenced by Marital Status.
Hypothesis HP10a: There is association between marital status and Spends of card.	Hypothesis HW10a: Spends of virtual wallet is influenced by Marital Status.
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by Marital Status	Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by Marital Status
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by Marital Status.	Hypothesis HW1a: Awareness about features of virtual wallet is influenced by Marital Status.
Plastic Money	Virtual Wallet
Level 0.05	Level 0.05
To analyze the perception and preference of user's transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.	To analyze the perception and preference of user's transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.
Hypothesis Statement	Hypothesis Statement
Variables: Preference	Variables: Preference
Hypothesis HP11 ₀ : Banking Customers <u>do not prefer</u> Plastic Money to Physical Visit to Bank Branches	Hypothesis HW110: Banking Customers do not prefer Virtual Wallet to Physical Visit to Bank Branches
Hypothesis HP11 _a : Banking Customers <u>prefer</u> Plastic Money to Physical Visit to Bank Branches	Hypothesis HW11a: Banking Customers prefer Virtual Wallet to Physical Visit to Bank Branches
Plastic Money	Virtual Wallet
Level 0.05	Level 0.05
To identify, on the basis of analysis of perception, the factors that impact growth and use of plastic money and virtual wallet	To identify, on the basis of analysis of perception, the factors that impact growth and use of plastic money and virtual wallet

Hypothesis Statement	Hypothesis Statement
Variables: Security	Variables: Security
Hypothesis HP120: Level of Security is not responsible for customers not opting for Plastic Money	Hypothesis HW120: Level of Security is not responsible for customers not opting for virtual Wallet
Hypothesis HP12a: Level of Security is responsible for customers not opting for Plastic Money	Hypothesis HW12a: Level of Security is responsible for customers not opting for virtual wallet
Variables: Education	Variables: Education
Hypothesis HP13 ₀ : Amount of Surcharge does not influence customers not opting for Plastic Money	Hypothesis HW13 ₀ : Amount of Surcharge does not influence customers not opting for Virtual Wallet
Hypothesis HP13 _a : Amount of Surcharge influences customers not opting for Plastic Money	Hypothesis HW13 _a : Amount of Surcharge influences customers not opting for virtual wallet
Variables: Support	Variables: Support
Hypothesis HP14 ₀ : Support of Banks does not influence customers not opting for Plastic Money	Hypothesis HW14 ₀ : Support of Banks does not influence customers not opting for virtual wallet
Hypothesis HP14 _a : Support of Banks influences customers not opting for Plastic Money	Hypothesis HW14 _a : Support of Banks influences customers not opting for virtual wallet

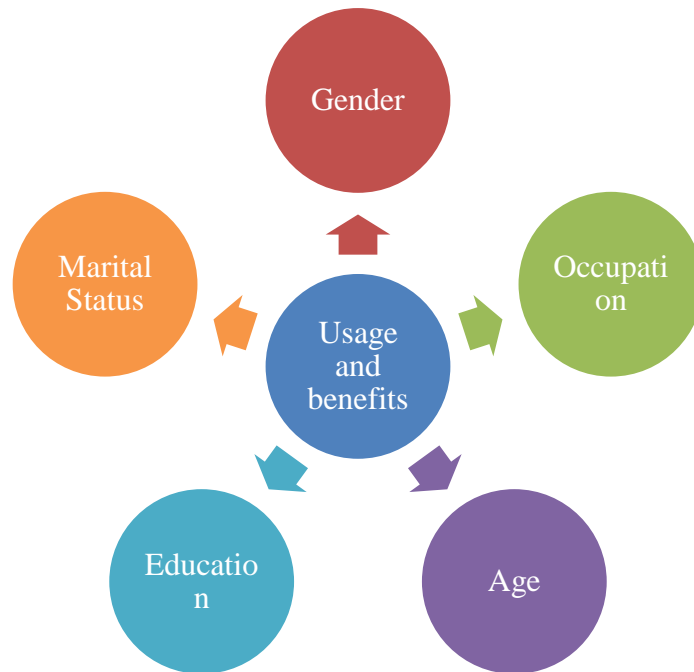


Figure 20 Demographic factors that are studied to determine the usage patterns

5.6: Research Design & Methodology

The primary and secondary objective of the research point out at various demographic and social factors that lead to the use a combination of survey and other statistical methods like chi square, ANOVA and other statistical analysis tools.

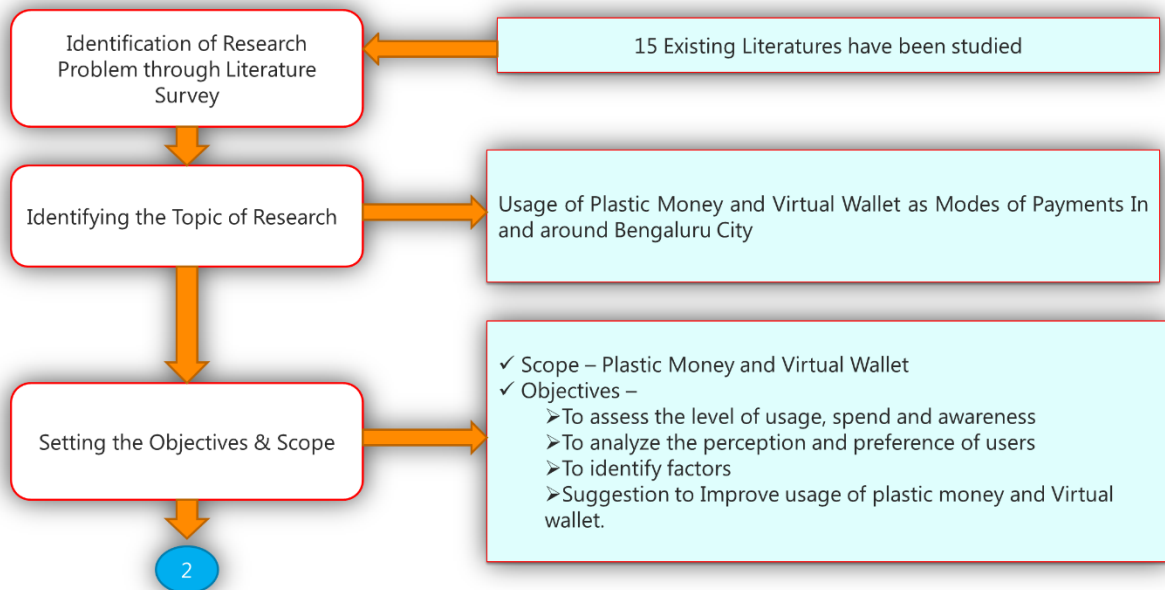
5.6.1: Mixed Methods Approach

The initial idea with this research was to bring out the message from the people which needed few iteration and in-depth analysis of the data collected during research. The outcome of the literature review was crystalized into set of queries for the survey. The survey itself was split with one survey questionnaire for mobile and the other for credit cards and debit cards. In this survey a great emphasis was given to a mix of object type and open ended queries to arrive at suitable conclusion.

During the survey Technology Acceptance model along with few iteration during the survey was found to be useful to understand the subject and test out the hypothesis outlined during the research.

Once the outcomes of the question were studied some inferences were drawn during the pilot survey. As virtual wallet is a new technology and so there are differences in the way the evaluation has to be carried out. The survey questionnaire was drafted after carefully studying the literature and the various outcomes.

A specially is the mix of indirect questionnaire which is used during the survey and leads to indirect inferences. The various aspects of virtual wallet security are little known to the users at the time of survey so the use of indirect questions like “How confident are you that your personal information will not be stolen?” is used to bring out the user’s confidence level while using the virtual wallet and also gives a glimpse of security and the users perception about security.



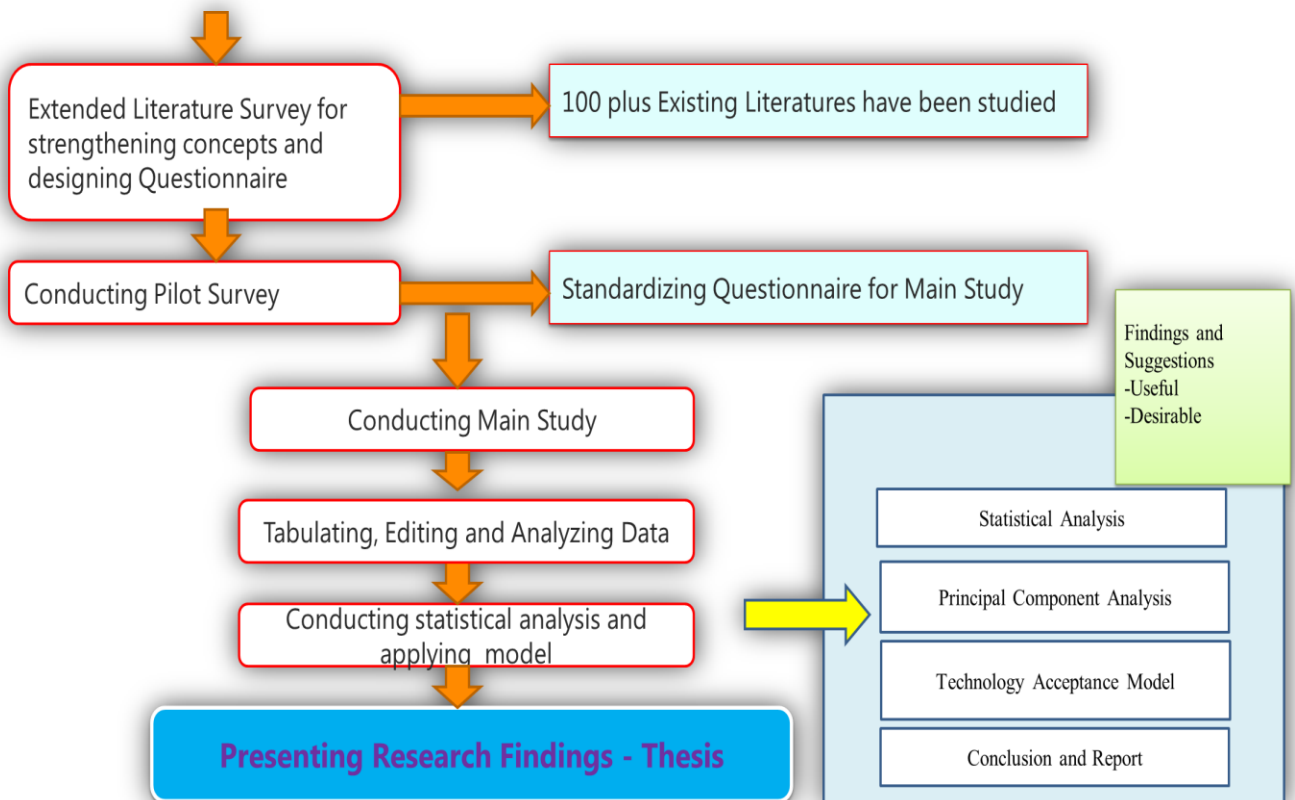
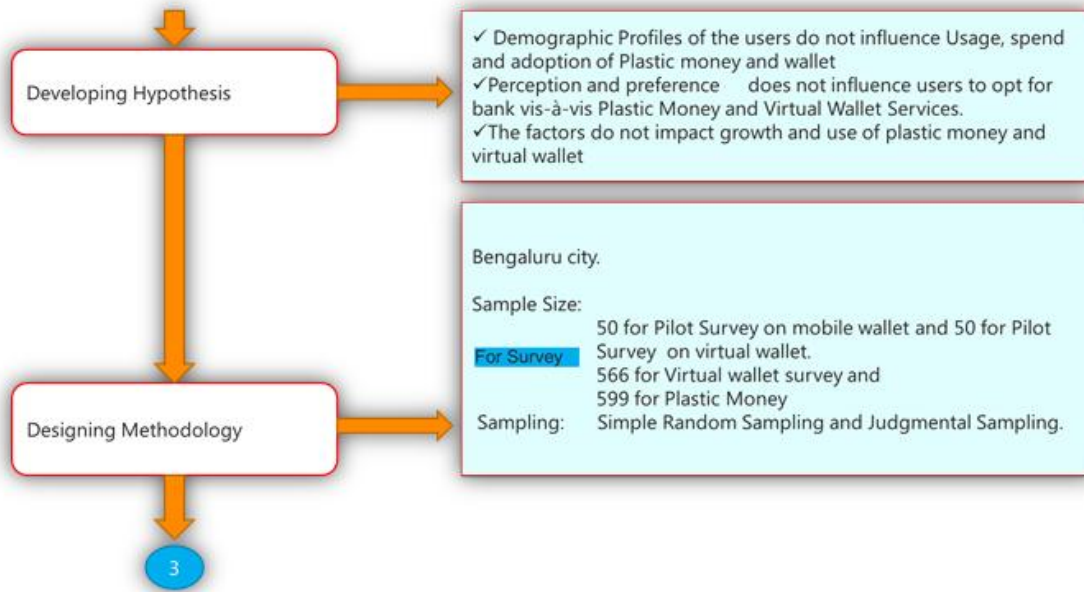


Figure 21 Research Design for the survey

Perception of users is very difficult to gauge from a standard set of questionnaire and it is extremely difficult to compare the perception of users of plastic money and virtual wallet in the absence of uniformity in terms of ease of use, features and other parameters. A simplified and modified view of Technical analysis is used for this survey as it involves two different kinds of financial tools like plastic money and virtualwallet.

This is an information systems theory that models how users come to accept and use a technology. It helps us to understand why the technology is adopted and why the same and the various aspects of the same are received by the user. It is most successfully used for computer and related technology model and that is why this was used to analyze the outcome of the survey.

5.6.2: Survey Questionnaire Methodology

Survey questionnaire is a well-established method of collecting data from users. This data collection technique used mostly electronic questionnaire and hard copy of the survey questionnaire that is used to collect the user information and views during the survey.

A key point during the research is the relative difficulty in getting users of virtual wallet and the absence of large scale acceptance of this financial transaction mechanism at various outlets.

To overcome the issues a set of questionnaire is drafted and responses are collected using electronic tablets at Airtel mobile wallet stores and other similar establishments. For a set of users, the data is collected via a combination of interview and questionnaire method. This was done to engage the audience and get the time from them to fill up the questionnaire.

The outcome of the pilot was used as a baseline for the subsequent survey efforts and the design of the survey was structured from simple direct questionnaire to detailed questions, indirect questions, Likert scale and then opinions. There was scope to provide feedback during pilot and actual survey. The form layout was kept simple and clear to give a clutter free look even though the survey had a large set of questionnaire.

5.6.3: Survey Construction

The survey was carried out using two different sets of questionnaire. One for virtual wallet and another was plastic money. The set of questionnaire is structured in a similar fashion but different in terms of the data set collected based on the interview questionnaire circulated.

Each survey has a top section that is used to collect the demographic information followed by multiple choice questions, Likert scales, indirect questions and open questions or places where the users can express their opinion and demand additional features or services.

This mixed approach was selected to gather data set specially engineered for particular cases like virtual wallet services which are just gaining acceptance in the market. This survey construction is also required to gauge the perception of the users in direct and indirect way as there is a likely hood of getting errors while asking similar repeated questions during the duration of the survey.

This survey would help in creating awareness in users as they saw the various kinds of security measures that are available with plastic money, some of these security features were known or used by users while others were not known to a large section of users.

The participants were a decent mix of technical and non-technical respondents and there was a chance of error while using technical or security terminology in the questionnaire. Thus a conscious effort has been made to reduce the technical jargons in the survey.

A range of scales have thus been used in the survey starting from binary values like yes/no to multiple choice and descriptive questions. Some of the questionnaires are closed ended for easy statistical analysis while some are open ended used for interpretation.

5.6.4: Survey Questionnaire Statements formation and interpretation

As already explained in previous sections the questionnaire consists of multiple choice closed ended to open ended forms and placeholder for expressing opinion, demanding new features or giving details in descriptive format.

Due to decent mix of questions it is required to sort the questionnaires into various categories for easy classification and then grouping these into appropriate set for further analysis.

All decisions and analysis of are dependent on correct categorization of the data set. Some of the steps are outlined below.

Step 1: Extract the factors from the Survey

The questionnaire can be classified into distinct categories as given below. This is the first step to identify and categorize the variables.

- | |
|--|
| <ol style="list-style-type: none">1. Awareness2. Cost3. Demography4. Feature5. Perception6. Preference7. Security8. Suggestions9. Usage |
|--|

Table 3 Categories into which the questionnaire can be classified

Table above shows that the survey included a lot of queries so it was important to classify the output into suitable groups for interpretation. Nine primary categories were covered as part of this survey.

Some of the identified factors have direct impact on the survey. While suggestions are useful in understanding the demands of user or the drawback of existing system. These suggestions also help in establishing few indirect answers like perception of users for a broader view of the system.

Step 2: Categorize the results

Both the virtual wallet and plastic money technology is used in a variety of ways in result in variation in quality of service parameters. While some providers offer best services in particular categories there are others which offer better services in another category. All this makes the survey extremely dependent and subjective.

Category	Questions
Awareness	How do you rate the following parameters while applying for credit and debit cards? [Easy payment method]
	How do you rate the following parameters while applying for credit and debit cards? [Safety is paramount]
	How do you rate the following parameters while applying for credit and debit cards? [Rewards]
	How do you rate the following parameters while applying for credit and debit cards? [Simplicity of use]
	How do you rate the following parameters while applying for credit and debit cards? [Fuel surcharge waver]
	What are the advantage of credit and debit card?
	Do you know your credit score?
Cost	Do you know the factors to look at before you apply for Credit Card in India?
	Are the annual Fees & Other charges good value for money?
	Is Transaction cost on your cards right?
	Are there hidden costs in your debit and credit card transaction?
	What is your financial goal this year?
	Are there hidden costs in your debit and credit card transaction?
Demography	Age
	Age Histogram
	Which credit card do you have?
	Gender
	Annual income
	Educational qualification
	Relationship status? (optional)
	Profession

Category	Questions
Feature	How do you rate the following parameters while applying for credit and debit cards? [Airline Miles]
	How do you rate the following parameters while applying for credit and debit cards? [Diner and luxury items]
	How do you rate the following parameters while applying for credit and debit cards? [Global acceptability]
	How do you rate the following parameters while applying for credit and debit cards? [Multicurrency card]
	Was it easy to apply for credit or debit card?
	Which feature excites you the most in credit card and debit card?
	Do you want to increase your credit limit?
	Would you prefer to get a Credit Card or Debit Card from your preferred bank? (provide bank's name)
	How do you rate the following parameters while applying for credit and debit cards? [EMI option]
	How do you rate the following parameters while applying for credit and debit cards? [Supported by most vendors]
	How do you rate the following parameters while applying for credit and debit cards? [Great offers]
	Which debit or credit card would you recommend for friends and family?
	How do you rate the following parameters while applying for credit and debit cards? [Card replaced before expiry]
Perception	Do you feel, you are stuck with your bank? If yes, why do you think so?
	Do you prefer to use debit and credit card for the following [Food]
	Do you prefer to use debit and credit card for the following [Transport]
	Do you prefer to use debit and credit card for the following [Apparel and shopping]
	Do you prefer to use debit and credit card for the following [Rent]
	Do you prefer to use debit and credit card for the following [Loan Payment]
	Do you prefer to use debit and credit card for the following [Electronics]
	Do you prefer to use debit and credit card for the following [Book Holiday]
Security	Do you prefer to use debit and credit card for the following [Others]
	How confident are you that your personal information will not be stolen?
Suggestions	What do you do to secure your card?
	Which feature you would like to add to Credit or Debit card (Plastic Money)?
Usage	Please suggest ways to improve Credit or Debit card (Plastic Money)?
	Do you use any of them
	How many times do you use credit or debit card in a week?
	What is your average expenses using credit or debit cards every week?2
	Do you use credit card to withdraw money?
	What do you use credit and debit card for?

Category	Questions
	Do you always carry your debit or credit with you?
	Do you make international money transfer using plastic money?
	Do you buy more when you get discount coupons?
	During which festival do you use Credit or Debit card (Plastic Money)?
	Which debit card do you have?
	How long have you been using the cards?
	How do you rate the level of your Satisfaction with your Cards?
	Who uses your card?
	Your average Credit Card bill for last 6 months?

Figure 22:Plastic money questionnaire category and the set of questions

Similar set of categorization was done for virtual wallet as well as an intermediate step that would aid in further analysis and statistical conclusion

Step 3: Mapping it to the perceived usefulness

There is no direct mapping of perceived usefulness as usefulness can depend on a variety of factors. ANOVA and other statistical measure like chi square test are used to analyze the impact of different groups and categories. There are many ways of deriving inferences in different groups and this is done through a sequence of steps as covered in the subsequent chapters. Technological assessment model is used to further compare the perception against the actual usage.

5.7: Summary

The chapter covered the way and the structure of the questionnaire and the data set for users. Overall acceptance and responses of the questionnaire is designed as per the research design and methodology. The chapter gives a view of methods which highlights the use of ANOVA and other techniques like technology assessment model that would be used extensively in the research. Finally, the chapters show how the questionnaire is categorized into appropriate categories which are used as groups to analyze and dataset.

Chapter 6: Pilot Survey

Chapter 6: Pilot Survey

6.1: Overview

Usage pattern of the card holders is analyzed during the survey on a small group of participants. The results are used to modify the questionnaire and check if relevant data was collected during the survey. The chapter summarizes how the various models are applied on the group of participants and how the questionnaire was finally modified to suit the needs of plastic money and virtual wallet participants. The result of the pilot survey is covered in this chapter and also gives an indication of the methodology used in this research. The pilot was carried out in Bengaluru district as per the research plan and the result of the analysis is documented below.

6.2: Composition of sample

The first round of questionnaire was framed and surveyed on a small no of participants. Some of these participants were given the hard copies of the form and some of the users have responded to the online questionnaire hosted in Google forms.

A total of around hundred participants with around half of these

Composition of sample	
Mobile wallet	50
Credit cards	50
Debit cards	50

Table 4 Composition of Virtual Wallet and Plastic Money in Pilot Survey

Table four gives the composition of the sample run for pilot survey. Due to a wide variety of cards and an ever increasing variety in payment options ideally the sample is influenced by many key drivers including macro and micro economic drivers. A

demonetization drive by the government of India in very recent time is one of macroeconomic factor and technological innovation in the payment space is another key factor for which it was essential to peg the composition at least 50 to have reliable outcome from the pilot survey.

The appropriate survey responses were collected and analyzed for credit and debit cards. The survey also gave an insight into the ground realities like the users where the users were not familiar with virtual wallet and its usage. Even users were neither aware of various features and services available nor aware of the security measures available with the wallet. The pilot made an attempt to find the impact of various factors influencing that have a direct or indirect bearing on the usage of cards. Several demographic factors like age, education, occupation and gender have been studied with appropriate statistical methods like average, percentage, range and standard deviation. The factors for various usage patterns are checked with chi square test.

First the users were asked to check the questions and the layout of questionnaire. The feedback was incorporated and a fresh set of questionnaire was created after incorporating the review comments.

6.3: Plastic money and virtual wallet usage in Bengaluru district

The usage of plastic money in Bengaluru district was chosen on various parameters. Bengaluru has the highest number of engineering engagement and specially those related to information technology users. These users are familiar with technology and it is assumed that this population would be able to discover the plastic money and virtual wallet features that would help in creating and gathering relevant information for the survey. While the entire country was just learning to use the mobile wallet technology in the year 2015, it was this city which had most number of startups and information technology related support. This city is also unique positioned with people from various parts of India residing in the city which has truly become cosmopolitan in nature. The usage of technology is at its best with a lot of young generation who has keen interest in trying out and experimenting with new technology.

Bengaluru was also known as garden city where a lot of people have settled post retirement. The city now also collects the largest amount of income tax from its thriving young working population. It is also historic importance and thus it is of strategic importance from many respects. All this makes Bengaluru the ideal location for carrying out research in plastic money and mobile wallet. The city also has a large number of users from various countries which have also influenced the habit of people in Bengaluru.

Minor changes have been suggested as per the feedbacks from the users and experts on the questionnaire and layout which have been considered for subsequent survey. It is also important to note that the sample size is carefully chosen for the final survey to be a large sample as the plastic money and virtual wallet technology is too new for most of the users. The sample size of 500 plus users for plastic money and virtual wallet is high enough for a sample size with a combined survey outcome of more than thousand users.

6.4: Forms for survey and data analysis

Google forms have been used to share the questionnaire online and hard copies were also distributed for collecting the responses. The maximum number of responses was collected through online as it was relatively easy to contact the users and send reminders to participants for collecting large number of inputs. The users also found a choice to submit forms online or submit hard copies. There are few reported limitations for the survey like the amount of time the users spend in comprehending the questionnaire and the users might not have spent time to clarify any question during the survey. It also requires multiple follow ups to get responses from people who are generally not interested in filling up long survey forms Google form data is readily available and can be exported easily in excel. This would shorten the process of typing the data collected via hard copies into specific format for analysis. Various excel add on tools are available where this survey data can be easily processed to carry out the statistical analysis.

Google forms are very user friendly and easy to change and have low administrative overheads. It was easy to incorporate the changes or feedback of the pilot survey and roll out the survey questionnaire with the minor modifications as applicable. This data from google forms can be exported easily and analyzed with the help of the excel data analytics toolkit and add-ins like multi-base and real Statistics which can be easily added to excel as add on tools.

6.5: Data

As two sets of survey are conducted so separate results are obtained for plastic money and virtual wallet technology. Both these data set are compared for demography, usefulness and other features.

6.6: Data Analysis

6.6.1: Average Values for Key Parameters

While average value of key parameters was necessary to estimate the depth and breadth of the impact, it was also evident that no single factor holds the key to further analysis for this reason five driving demographic factors were identified at the start.

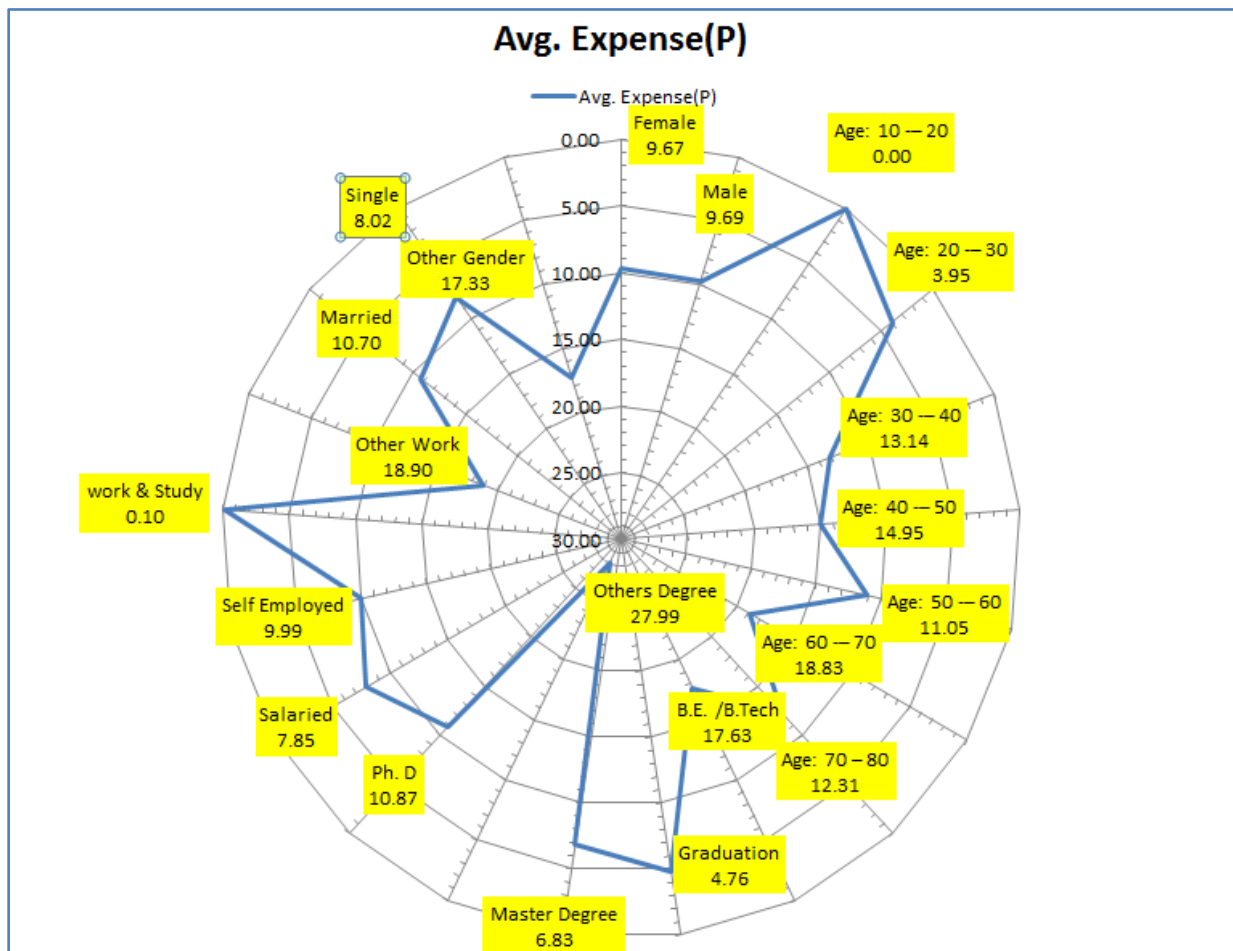


Figure 23 Average Expense Value in thousands for Plastic money

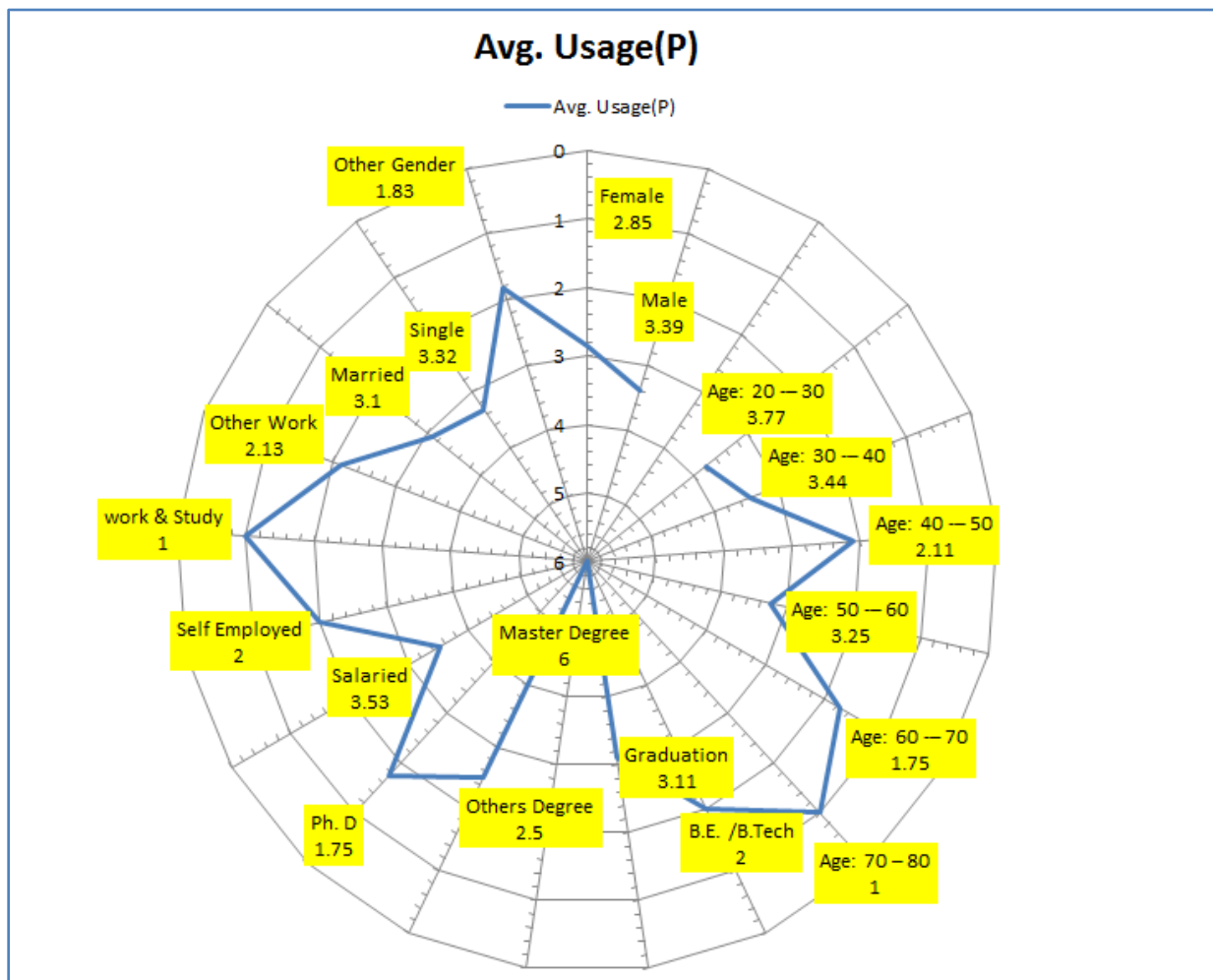


Figure 24 Average Usage for Plastic Money

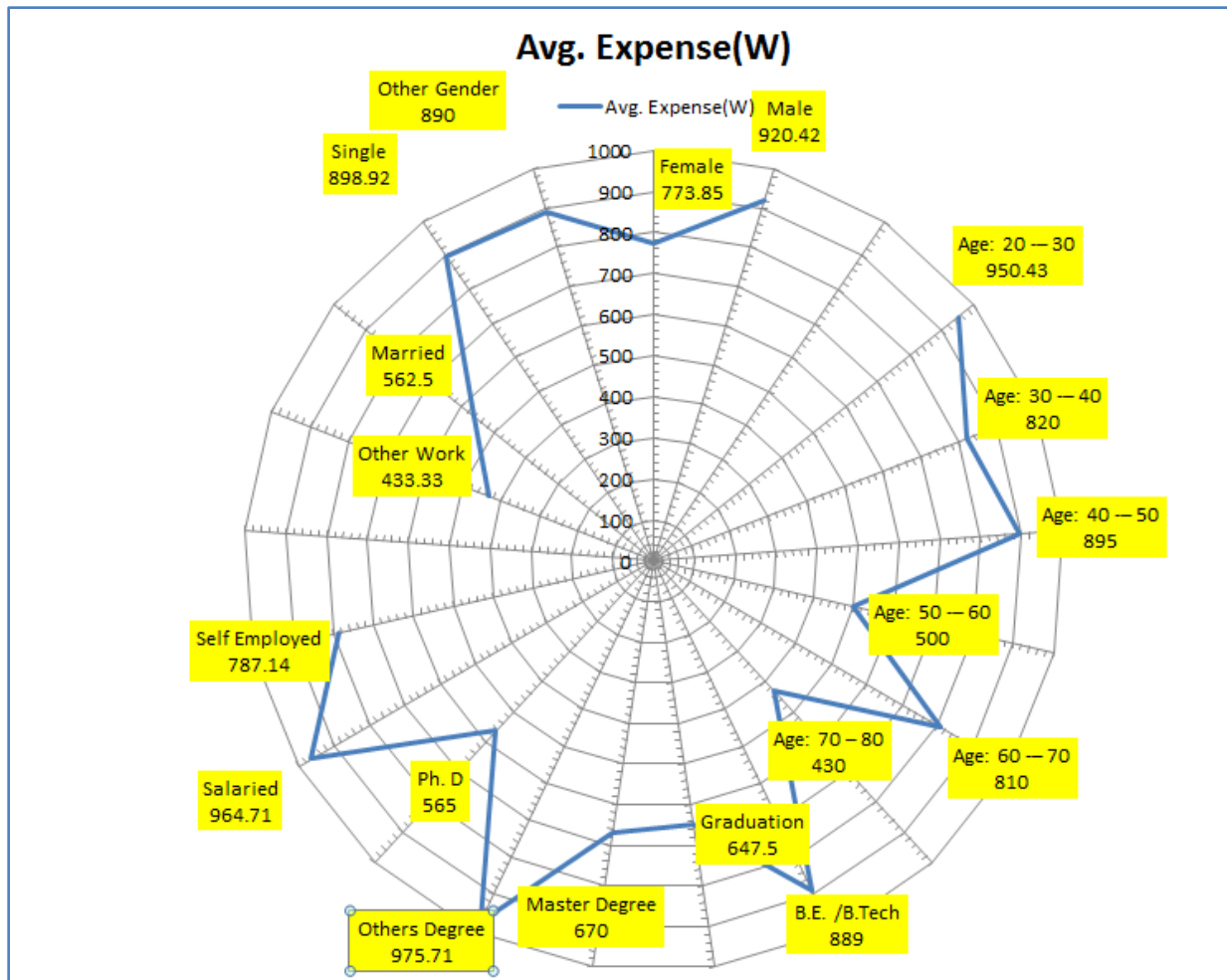


Figure 25 Average Expense Value for Virtual Wallet

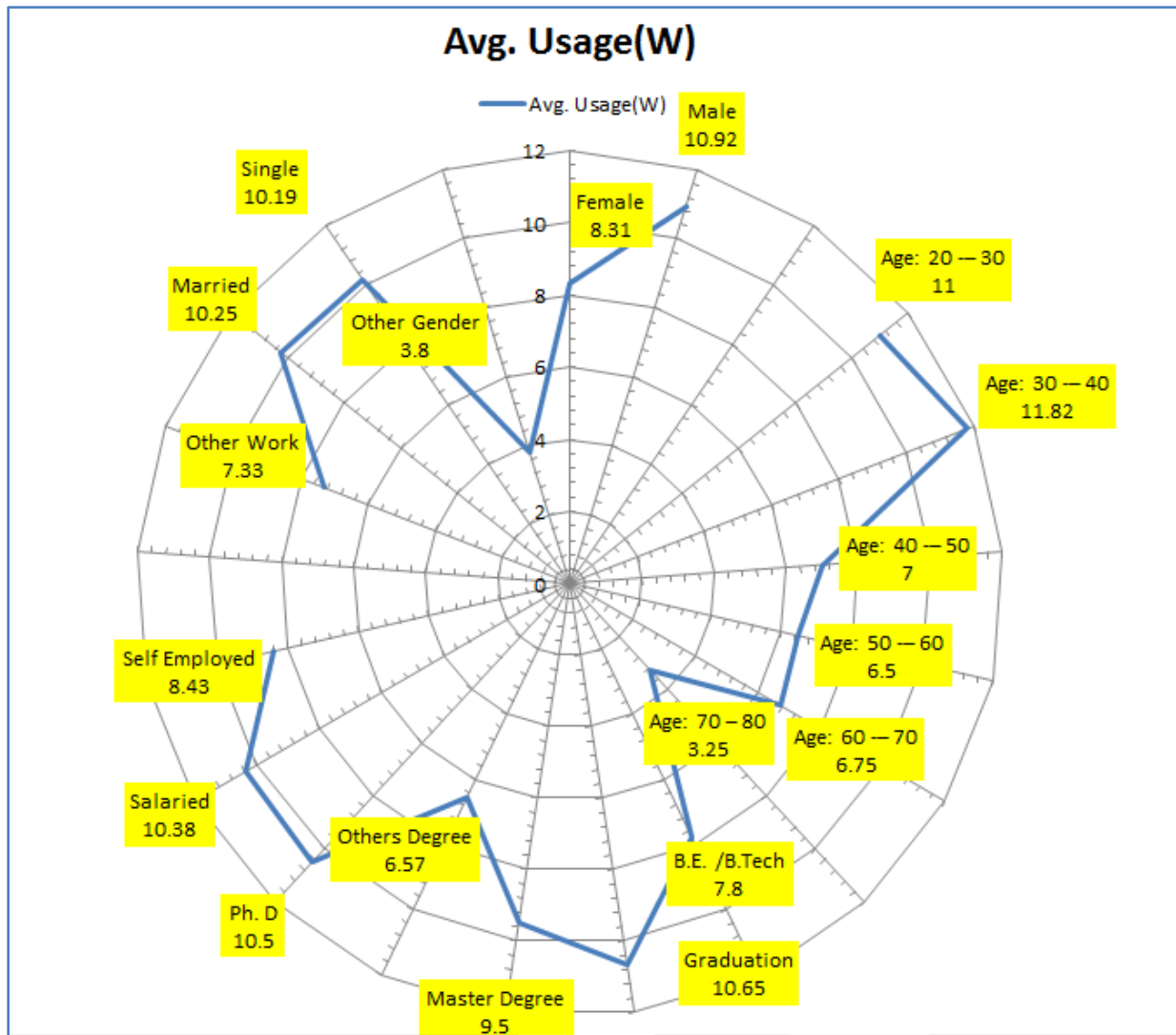


Figure 26 Average Usage Value for Virtual Wallet

6.6.2: Chi square test for key parameters

Plastic money	Virtual Wallet
	Pilot

Variable	Expense	Usage	Awareness	Expense	Usage	Awareness
Gender	No	Yes	No	No	No	No
Age	Yes	No	No	No	No	Yes
Education	Yes	No	Yes	No	No	Yes
Profession	Yes	No	Yes	No	No	Yes
Marital Status	No	No	No	No	No	No

Table 5 Gives Chi Square test results where significance is observed in Pilot Survey (Null hypothesis accepted yes or no)

6.6.3: Association between Plastic Money and Variables Identified in Objective One

Category: Plastic Money		
Significance Level 0.05		
To assess the level of usage, spend and awareness about features among the users		
Hypothesis Statement	P-Value	Interpret results
Variables: Gender		
Hypothesis HP10: Plastic Money use is not influenced by gender.	0.38	Accept
Hypothesis HP1a: Plastic Money use is influenced by gender.		Reject

Hypothesis HP2-0: Spends of Plastic Money is not influenced by gender.	0.02	Reject
Hypothesis HP2a: Spends of Plastic Money is influenced by gender.		Accept
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by gender.	0.8	Accept
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by gender.		Reject
Variables: Age		
Hypothesis HP70: Plastic Money use is not influenced by age	0.036	Reject
Hypothesis HP7a: Plastic Money use is influenced by age		Accept
Hypothesis HP80: There is no association between age and Spends of card.	0.34	Accept
Hypothesis HP8a: There is association between age and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by age.	0.5	Accept
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by age.		Reject
Variables: Education		
Hypothesis HP3 ₀ : There <u>is no association</u> between education and high usage of card.	0.01	Reject
Hypothesis HP3a: There <u>is association</u> between education and high usage of card.		Accept
Hypothesis HP40: There is no association between education and Spends of card.	0.51	Accept
Hypothesis HP4a: There is association between education and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by education.	0.06	Reject
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by education.		Accept
Variables: Occupation		
Hypothesis HP50: Plastic Money use is not influenced by occupation.	0	Reject

Hypothesis HP5a: Plastic Money use is influenced by occupation		Accept
Hypothesis HP60: There is no association between occupation and Spends of card.	0.11	Accept
Hypothesis HP6a: There is association between occupation and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by occupation.	0	Reject
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by occupation.		Accept
Variables: Marital Status		
Hypothesis HP90: Plastic Money use is not influenced by marital status	0.11	Accept
Hypothesis HP9a: High plastic moneys use is influenced by marital status		Reject
Hypothesis HP100: There is no association between marital status and Spends of card.	0.7	Accept
Hypothesis HP10a: There is association between marital status and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by Marital Status	0.6	Accept
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by Marital Status.		Reject

Table 6 Objective One Hypothesis Testing for Pilot Survey

Sample to show how the value was interpreted
<p>Hypothesis HP8₀: There <u>is no association</u> between age and Spends of card.</p> <p>Hypothesis HP8_a: There <u>is association</u> between age and Spends of card.</p> <p>Interpret results: Since the P-value (0.35) is more than the significance level (0.05), we do accept the null hypothesis. Thus, we conclude that there is no relationship between age and plastic money average spends.</p>

Table 7 Sample to show how the value was interpreted

6.6.4: Association between Plastic Money and Variables Identified in Objective Two

Category:	Plastic Money
-----------	---------------

Significance	Level 0.05		
Objective:	To analyze the perception and preference of banking customers (both users and non-users of plastic money or virtual wallet services) on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.		
Variables:	Hypothesis Statement	P-Value	Interpret results
Preference	Hypothesis HP11₀: Banking Customers <u>do not prefer</u> Plastic Money to Physical Visit to Bank Branches	0.61	Accept
	Hypothesis HP11_a: Banking Customers <u>prefer</u> Plastic Money to Physical Visit to Bank Branches		Reject

Table 8 Objective Two Hypothesis Testing for Pilot Survey

6.6.5: Association between Plastic Money and Variables Identified in Objective Three

Category:	Plastic Money		
Significance	Level 0.05		
Objective:	To identify, on the basis of analysis of perception, the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.		
Variables:	Hypothesis Statement	P-Value	Interpret results
Awareness	Hypothesis HP12₀: Level of Safety <u>is not responsible</u> for customers not opting for Plastic Money	0.03	Accept
	Hypothesis HP12_a: Level of Safety <u>is responsible</u> for customers not opting for Plastic Money		Reject

Educate	Hypothesis HP13₀: Amount of Surcharge is <u>not responsible</u> for customers not opting for Plastic Money	0.57	Accept
	Hypothesis HP13_a: Amount of Surcharge is <u>responsible</u> for customers not opting for Plastic Money		Reject
Security	Hypothesis HP14₀: Extensive Support of Banks is not responsible for customers not opting for Plastic Money	0.68	Accept
	Hypothesis HP14_a: Extensive Support of Banks is responsible for customers not opting for Plastic Money		Reject

Table 9 Objective Three Hypothesis Testing for Pilot

6.6.6: Association between Virtual Wallet and Variables Identified in Objective One

Category: Virtual Wallet		
Significance Level 0.05		
To assess the level of usage, spend and awareness about features among the users		
Hypothesis Statement	P-Value	Interpret results
Variables: Gender		
Hypothesis HW1 ₀ : Gender <u>has no influence</u> on how many times virtual wallet is used.	0.31	Accept
Hypothesis HW1 _a : Gender <u>has influence</u> on how many times virtual wallet is used.		Reject
Hypothesis HW2-0: Spends of virtual wallet are not influenced by gender.	0.39	Accept
Hypothesis HW2 _a : Spends of virtual wallet is influenced by gender.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by gender.	0.61	Accept
Hypothesis HW1 _a : Awareness about features of virtual wallet is influenced by gender.		Reject
Variables: Age		

Hypothesis HW7 ₀ : Age <u>has no influence</u> on how many times virtual wallet is used.	0.48	Accept
Hypothesis HW7 _a : Age <u>has influence</u> on how many times virtual wallet is used.		Reject
Hypothesis HW8-0: Spends of virtual wallet are not influenced by age.	0.57	Accept
Hypothesis HW8a: Spends of virtual wallet is influenced by age.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by age.	0	Reject
Hypothesis HW1a: Awareness about features of virtual wallet is influenced by age.		Accept
Variables: Education		
Hypothesis HW3 ₀ : Education has <u>no influence</u> on the preference for particular type of wallet.	0.27	Accept
Hypothesis HW3a: Education <u>has influence</u> on the preference for particular type of wallet.		Reject
Hypothesis HW4-0: Spends of virtual wallet are not influenced by education.	0.61	Accept
Hypothesis HW4a: Spends of virtual wallet is influenced by education.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by education.	0.05	Reject
Hypothesis HW1a: Awareness about features of virtual wallet is influenced by education.		Accept
Variables: Occupation		
Hypothesis HW5 ₀ : Occupation <u>has no influence</u> on how many times virtual wallet is used.	0.66	Accept
Hypothesis HW5a: Occupation <u>has influence</u> on the preference for particular type of wallet.		Reject
Hypothesis HW6-0: Spends of virtual wallet are not influenced by occupation.	0.51	Accept
Hypothesis HW6a: Spends of virtual wallet is influenced by occupation.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by occupation.	0.02	Reject

Hypothesis HW1a: Awareness about features of virtual wallet is influenced by occupation.		Accept
Variables: Marital Status		
Hypothesis HW9 ₀ : Marital Status <u>has no influence</u> on how many times virtual wallet is used.	0.34	Accept
Hypothesis HW9 _a : Marital Status <u>has influence</u> on how many times virtual wallet is used.		Reject
Hypothesis HW10-0: Spends of virtual wallet are not influenced by Marital Status.	0.52	Accept
Hypothesis HW10a: Spends of virtual wallet is influenced by Marital Status.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by Marital Status	0.7	Accept
Hypothesis HW1a: Awareness about features of virtual wallet is influenced by Marital Status.		Reject

Table 10 Objective One Hypothesis Testing for Virtual Wallet Survey

6.6.7: Association between Virtual Wallet and Variables Identified in Objective Two

Category:	Virtual Wallet		
Significance	Level 0.05		
Objective:	To analyze the perception and preference of banking customers (both users and non-users of plastic money or virtual wallet services) on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.		
Variables:	Hypothesis Statement	P-Value	Interpret results
Preference	Hypothesis HW11₀ : Banking Customers <u>do not prefer</u> Mobile Wallet to Physical Visit to Bank Branches	0.34	Accept
	Hypothesis HW11_a : Banking Customers <u>prefer</u> Mobile Wallet to Physical Visit to Bank Branches		Reject

Table 11 Objective Two Hypothesis Testing for Virtual Wallet Survey

6.6.8: Association between Virtual Wallet and Variables Identified in Objective Three

Category:	Virtual Wallet		
Significance	Level 0.05		
Objective:	To identify, on the basis of analysis of perception, the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.		
Variables:	Hypothesis Statement	P-Value	Interpret results
Awareness	Hypothesis HW12₀ : Level of Safety <u>is not responsible</u> for customers not opting for Mobile Wallet	0.27	Accept
	Hypothesis HW12_a : Level of Safety <u>is responsible</u> for customers not opting for Mobile Wallet		Reject
Educate	Hypothesis HW13₀ : Amount of Surcharge <u>is not responsible</u> for customers not opting for Mobile Wallet	0.56	Accept
	Hypothesis HW13_a : Amount of Surcharge <u>is responsible</u> for customers not opting for Mobile Wallet		Reject
Security	Hypothesis HW14₀ : Extensive Support of Banks <u>is not responsible</u> for customers not opting for Mobile Wallet	0.23	Accept
	Hypothesis HW14_a : Extensive Support of Banks <u>is responsible</u> for customers not opting for Mobile Wallet		Reject

Table 12 Objective Three Hypothesis Testing for Virtual Wallet Survey

6.6.14: View on wallet users on perceived easy or use perceived usefulness

Technology assessment model is one of the methods to access the attitude of users. This method gives an indication of the masses towards using a particular goods and services when the goods and services have high cohesion with technical innovations as in this case

of cards and wallets which are largely driven by the technical components and innovation in technical space. Other models would fail to access the inclination to use as human beings are essentially unpredictable when it comes to their personal choice and preferences. Technology assessment model tends to arrive at a reasonable justification to feel the pulse of the masses. The table given below is summary information. While it is easy to gauge the Perceived ease of use by asking simple queries where respondents can rank the “Ease of payment method” and the “Simplicity of use” there Perceived usefulness is difficult to state for a new and emerging payment method like mobile wallet. While most users feel that the mobile payments are useful, it was clear during the pilot survey that the users were unable to quantify the Perceived usefulness factor for various reasons and the only reason the respondents stated was “mobile/virtual wallet is useful for payments”. So the survey had to take a different approach to understand the perceived usefulness like asking users to give their view on open wallet, rewards and accessibility.

Give your view on the following Parameters concerning “Why you use Wallet?”						
	Weights	Excellent	Very Good	Good	Average	Poor
Easy payment method	2	10	4	10	14	12
Simplicity of use	1	19	4	6	10	11
Weighted Average of Ease of use		13	4	9	13	12
Safety is paramount	4	12	6	9	17	6
Open Wallets	1	20	5	6	5	14
Accessible from laptop and mobile	3	16	7	4	8	15
Rewards	2	15	4	5	10	16
Weighted Average of Perceived Usefulness		16	6	6	10	13
Weighted Average of Ease of use and Perceived Usefulness		21	7	12	18	18

How to interpret the table?

Inference: Both perceived ease of use and perceived usefulness scores are excellent across categories. So all people are going in for mobile wallet for the excellent ease of use and excellent Perceived usefulness across various categories.

The only worry is that the Average and Poor category also has high values even though the highest values are recorded in the excellent category.

Table 13 View on the key parameters by wallet users

It may be useful here to note that the Easy payment method and simplicity of use are quite separate influencing factor while using virtual wallet. Let us understand this via an example of. A bar code reader or a QR code reader can be useful for particular users who find it easier to take the picture of a QR code and complete the payment but for another category of user simplicity of use was more important where the users felt it much more simple/convenient to type the cell number instead of using the QR code. This effect was felt as per the age and technical acumen of the users.

6.7: Summary

Chapter outlines the techniques used to formulate the questionnaire and the pilot survey. The chapter also deals with the selection of large sample of participants to deal with the discrepancy due to the rapid changes in the virtual wallet space and the changes that have been brought about by the use of online forms used during the survey. This chapter also talks about the feedback that was collected in terms of layout and content of the survey from participants and how that leads to the changes in the questionnaire and form layout. Finally, the chapter ends with a description of the google forms that was used to collect responses.

The chi square test establishes the association between key demographic variables and frequency of usage of wallet and plastic money. Similar assessment is done for average spend on mobile wallet and plastic money.

Chapter Seven: Analysis

Chapter Seven: Analysis

7.1: Overview

Further analysis on data points highlight finer elements in the data sample that was collected during the survey. This chapter focuses on various dimensions to extract key information that can be used in multiple ways.

7.2: Data Analysis

Data collected during the survey is grouped in multiple ways. The breakdown of the survey participants by employment is given below. Data shows that each group was adequately represented in the survey.

Card Statistics

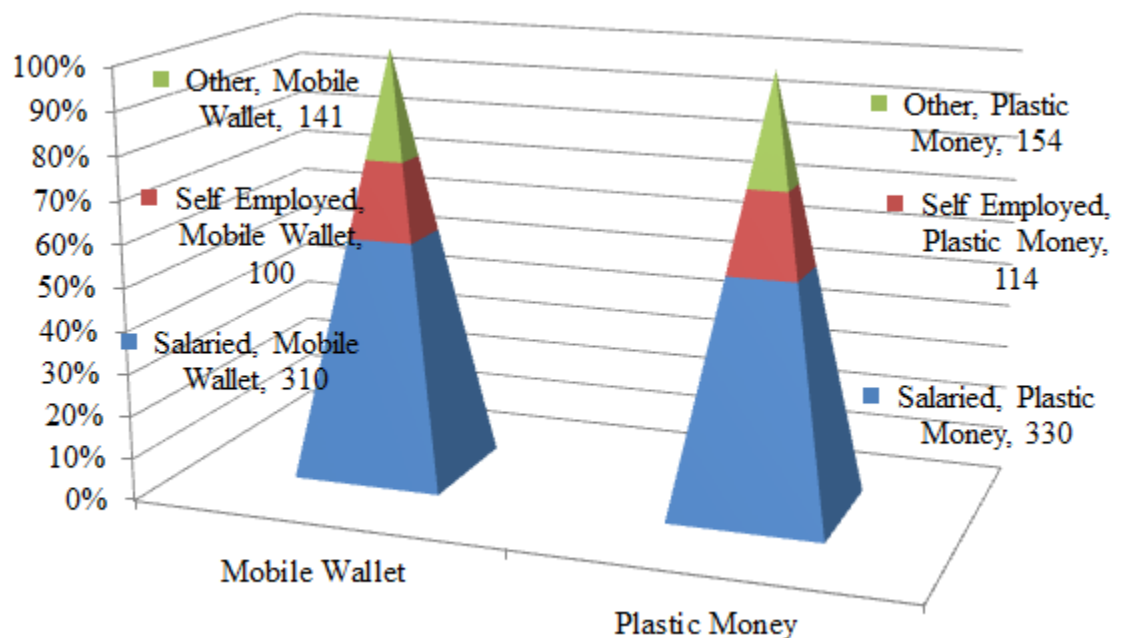


Figure 27 Employment statistics for wallet and plastic money user

	Mobile Wallet	Plastic Money
Salaried	310	330
Self Employed	100	114
Other	141	154
Total	551	598

Table 14 Employment statistics for wallet and plastic money user

Table above shows that each of the group was adequately represented in the survey.

1. Pilot Survey

Category Gender	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
Female	9666.20	2.85	773.85	8.31
Male	9685.65	3.39	920.42	10.92
Grand Total	9675.15	3.10	844.20	9.56
Category Age	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
Age: 10 – 20				
Age: 20 – 30	3945.91	3.77	950.43	11.00
Age: 30 – 40	13138.89	3.44	820.00	11.82
Age: 40 – 50	14949.33	2.11	895.00	7.00
Age: 50 – 60	11050.83	3.25	500.00	6.50
Age: 60 – 70	18832.50	1.75	810.00	6.75
Age: 70 – 80	12310.00	1.00	430.00	3.25
Grand Total	9675.15	3.10	844.20	9.56

Category Education	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
B.E. /B. Tech	17632.22	2.00	889.00	7.80
Graduation	4763.46	3.11	647.50	10.65
Master Degree	6833.33	6.00	670.00	9.50
Others	27992.50	2.50	975.71	6.57
Ph. D	10871.00	1.75	565.00	10.50
Grand Total	9675.15	3.10	749.44	9.00
Category Employment	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency Virtual Wallet
Other	18900.42	2.13	433.33	7.33
Salaried	7846.83	3.53	964.71	10.38
Self Employed	9993.66	2.00	787.14	8.43
work integrated course stipend	100.00	1.00		
(blank)				
Grand Total	9675.15	3.10	844.20	9.56
Category Marital Status	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency Virtual Wallet
Married	10695.00	3.10	562.50	10.25
Other	17333.17	1.83	890.00	3.80
Single	8023.77	3.32	898.92	10.19
Grand Total	9675.15	3.10	844.20	9.56

Table 15 Average Values for Key Parameters in pilot survey

Table above gives the average expenses and average usage frequency for plastic money and mobile wallet. Gender, age, education, employment and marital status are considered as the primary categories for analysis the data is collated for each of the categories. Frequency of use is averaged for each week and average expense is also

calculated per week. A primary analysis on this data set confirms that married people spend more than singles; self-employed spend more than the salaried counterpart. A higher degree does not necessarily translate into higher transactions or higher expense. Age and Gender (except teenager) has no significant impact on spending habits. **It is not clear if the salaried and self-employed people have significant difference as self-employed men also use the cards and wallet for personal as well as professional transactions.** For similar reason further analysis was required to bring out the difference in usage for each gender. Even for other factors further in-depth analysis was considered just and reasonable.

The significance of various categories and the x-critical value is calculated in the pilot survey. The values are used to test the association between the various variables and to arrive at conclusion of the objectives framed as part of the survey.

2.Final Survey

Data was collected from various locations, key location data is given below.

Heat Map – Bengaluru Urban			
No of respondents	Latitude	Longitude	
130	12.9716	77.5946	City Centre and MG road
30	12.8421	77.6631	Electronic City
20	12.9317	77.6227	Koramangala
64	12.9128	77.6092	BTM
70	12.969	77.7509	Whitefield
55	13.0085	77.4996	Peenya
94	13.0324	77.5992	Hebbal
46	13.0078	77.7338	K R Puram
60	13.0177	77.645	Banaswadi
30	13.0177	77.645	Hennur

Heat Map – Bengaluru Rural			
No of respondents	Latitude	Longitude	
140	12.95512	77.26342	Magadi
112	13.30886	77.54769	Doddaballapura
84	13.2427	77.71935	Devanahalli
84	13.06618	77.79626	Hoskote
28	12.76769	77.77016	Attibele
154	12.77036	77.64382	Jigani
56	13.13105	77.36092	T.Begur

The data from various sources on the internet also gives a fair indication of the contributing factors. One such information is the depth of credit information in the country as compared with others countries. This world bank has given a rating of 7 which shows good amount of credit information is available in the country.

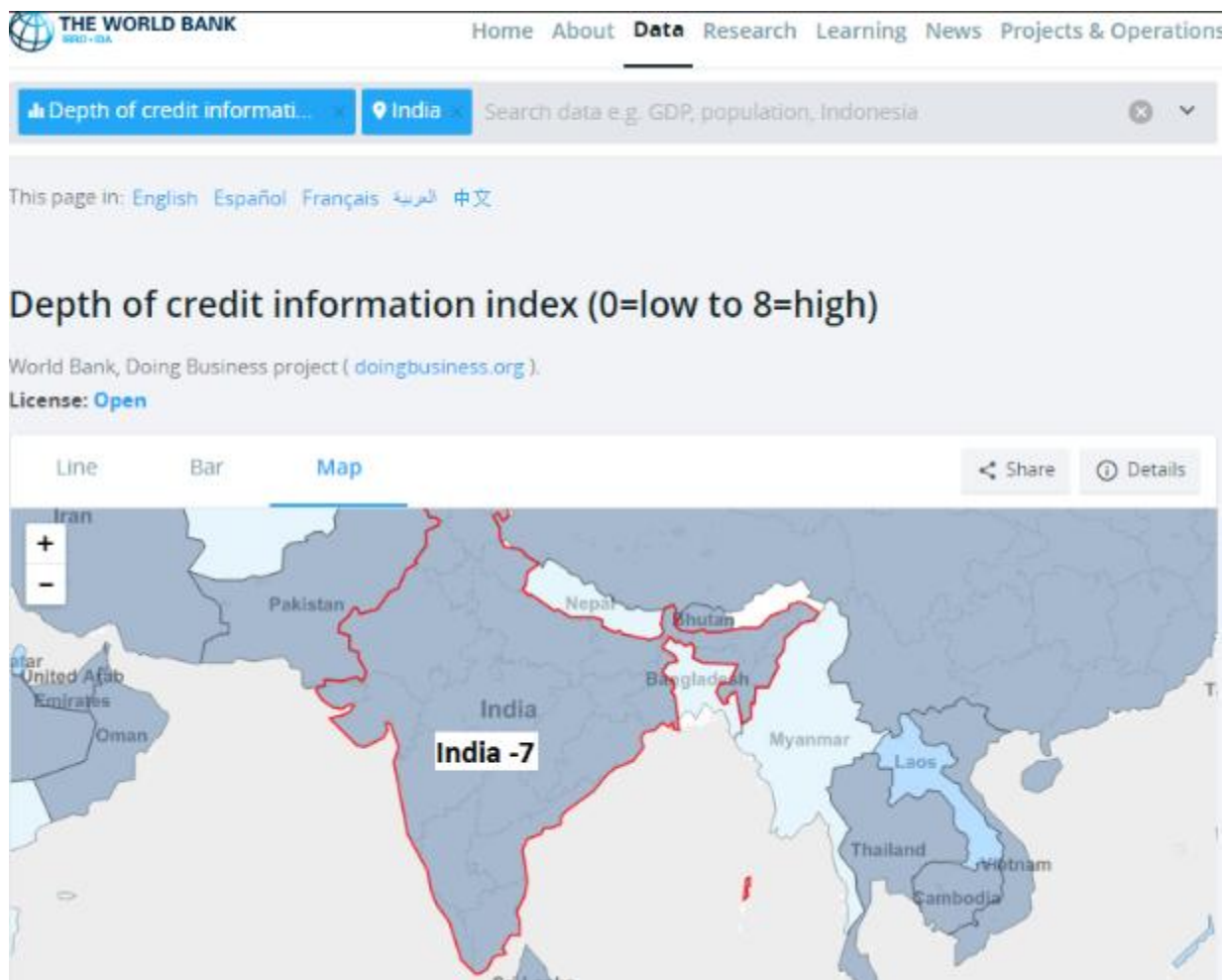


Figure: Taken from Work Bank Data Available Online

Category: Gender	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
Female	10131.20	2.09	965.13	10.15
Male	9758.01	2.01	1039.27	10.58
Others/Blank			1195.71	13.00
Grand Total	9926.22	2.04	1006.59	10.43

Category: Age	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
Age: 10 – 20	13504.31	1.67	322.00	5.27
Age: 20 – 30	8284.84	2.28	931.83	10.39
Age: 30 – 40	11255.44	2.22	1088.88	10.80
Age: 40 – 50	10218.09	1.96	1002.50	11.01
Age: 50 – 60	10250.87	2.00	1015.53	10.28
Age: 60 – 70	9266.48	1.92	1082.17	10.95
Age: 70 – 80	10526.75	1.77	1078.77	9.67
Grand Total	9926.22	2.04	1006.59	10.43
Category: Education	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
B.E. /B. Tech	10002.63	1.91	1064.69	10.34
Graduation	8729.71	2.15	1012.68	10.59
Master Degree	6833.33	6.00	670.00	9.50
Others	10905.07	2.04	963.39	10.75
Ph. D	9747.95	1.85	911.88	10.58
(blank)	13504.31	1.67		
Grand Total	9926.22	2.04	924.53	10.36
Category: Employment	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency for Virtual Wallet
Other	10664.01	1.95	1021.90	9.94
Salaried	9544.82	2.11	1000.92	10.75
Self Employed	10119.83	1.97	1100.69	11.03
work integrated course stipend	100.00	1.00		
(blank)			322.00	5.27
Grand Total	9926.22	2.04	1006.59	10.43

Category: Marital Status	Average Expense for Plastic Money	Average Usage Frequency for Plastic Money	Average Expense for Virtual Wallet	Average Usage Frequency Virtual Wallet
Married	10684.20	1.94	1040.72	11.02
Other	9911.10	1.83	987.66	10.48
Single	9623.03	2.14	995.80	10.13
Grand Total	9926.22	2.04	1006.59	10.43

Table 16 Average value of key parameters in final survey

Table above defines key parameters that are analyzed during final survey and we find each of the demographic factors can also be looked at from various angles. It may be noted that the average expense for plastic money and average expense for virtual wallet is collected over 1 week. Usage frequency is also given for a week, it can be seen that there is no significant difference in the spending habits of different categories of people like married unmarried or single and others. Self-employed people and the others seem to have a higher spending but this difference doesn't take into account the business transactions that are done by the plastic money or virtual wallet so it cannot be concluded that is having people spend less than the self-employed or other category. Advanced education course we get the similar result as given India pilot survey and education doesn't seem to influence our at least higher education doesn't seem to influence the spending habit of people neither does that influence the usage frequency it is up to now that the fire division does not translate into higher spending individual. When it comes to gender females think to have a little bit higher spending habit than male. Final survey does have a deeper analysis into the gender dynamics of usage of cards that would be explained in subsequent category.

Chi square test and P values across various categories are calculated. At a 1st class it can be seen that the expense and usage frequency of plastic money is it significant when it comes to education this is a little deviation from the previous analysis result. Fashion significantly related to the average expense of plastic money. Fatigue analysis will be

done insert sequence action on this data to bring out various points hidden in the given data set.

3.Awareness about getting a new plastic money card

To access the level of awareness while buying the card the customer was asked the question “Do you know the factors to look at before you apply for Credit Card in India?” The respondents were grouped into three groups.

- i. Fully aware if survey participants could list greater than 3 factors
- ii. Aware to certain extent if survey participants could list up to 3 factors
- iii. Not aware if they could list zero or one factor.

Do you know the factors to look at before you apply for Credit Card in India?	Number of response
Fully aware	241
Aware to certain extent	174
Not aware	179

Table 17 Factors to look out for while applying for card

The table shows that there is high level of awareness about the various factors while opting for new plastic money. This may be attributed to the increase in advertisement and promotions done by the companies.

4.Awareness on their own credit score

To access the level of awareness while buying the card the customer was asked the question “Do you know your credit score?”

Do you know your credit score?	Number of response
Yes	291
No	307

Table 18 Awareness about credit score

Table above shows the result shows clearly the users are not aware of their own credit scores. The best question to be asked during the survey was to ascertain if user have enough information about the credit scores which is basic to interact with the industry. It is very surprising it is not loan to people and most users don't care about it. It reflects the cast in terms of economy India as well as Bengaluru region. Things are changing slowly but these needs to be expedited higher education and other awareness campaigns.

5. Awareness about benefits of using the cards

To access the level of awareness while using cards the customer was asked the question “What is the advantage of credit and debit card?”. The respondents were grouped into three groups.

- i. Fully aware if survey participants could list greater than 3 factors
- ii. Aware to certain extent if survey participants could list up to 3 factors
- iii. Not aware if they could list zero or two factor.

What are the advantage of credit and debit card?	Number of response	Percentage
Fully aware	142	24
Aware to certain extent	127	21
Not aware	330	55

Table 19 Advantage of credit and debit card

The result shows that the users are not aware of the benefits of the card to the extent desirable as most of the user seems to be using the card for one or two reasons mostly.

6. Customers' awareness level

Most of the time the users are looking for maximum number of features while buying the cards as there is no significant difference in the means of the various factors as given in the table.

How do you rate the following parameters while applying for credit and debit cards? ^{PM}	Sum	Average
Easy payment method	1470	2.45
Safety is paramount	1605	2.69
Rewards	1568	2.63
Simplicity of use	1568	2.62
Fuel surcharge waver	1560	2.64
EMI option	1494	2.52

Supported by most vendors	1580	2.66
Great offers	1473	2.47
Card replaced before expiry	1530	2.57
Safety, Fuel Surcharge waver and wide support by various vendors are the key features that users are looking for in plastic money. Though the users are almost looking for maximum number of features and none of the feature is very far from the average.		

Table 20 Importance of various parameters while applying for card

Table above shows the breakup of various parameters while applying for cards. Earlier stats made it was clear that users new latest 3 features card it was partitioned to esquire which of these features where most widely used and not likely to be known across different customer segments. Most of the features during the survey have similar score. Safety, fuel surcharge, and extensive vendor support seems to be the key parameters while applying for the card. So it is likely that these three factors are most widely known to people and that is why they are looking for it.

7.Demographic variables and level of awareness

The mean values of the various factors were analyzed for the respondents in the previous table. 278 of the 599 respondents were found to be over the mean value of 2.58. Each of the demographic factors is analyzed assigning numerical value to the survey values.

Category	Value
Very Desirable	5
Desirable	4
Neutral	3
Undesirable	2
Very undesirable	1

Table 21 Category and mapping to values

Table above shows how each category was rated by customers. Very desirable is considered number five for analysis. Very undesirable was given a score of one for further analysis.

The resulting mean was compared for each Demographic variable. The result summarized in the table shows the High and low category for the given demographic variables like Age, Gender, Relationship status and Profession.

Demographic – Awareness about features while buying card Figure in brackets represents percentages.							
Age	High Awareness Category Age 10 - 20 ; 5/9(55)	Age 20 - 30: 58/119 (48)	Age 30 - 40: 44/98 (45)	Low Awareness Category Age 40 - 50: 49/112 (43)	Age 50 - 60: 47/97 (48)	Age 60 - 70: 47/103 (46)	Age 70 - 80: 28/61 (46)
Gender	Low Awareness Category Male 150/329 (45)	High Awareness Category Female 128/270 (47)					
Relationship status	Married 63/144 (43)	High Awareness Category Single 175/355 (49)	Low Awareness Category Others 40/101 (39)				
Profession	Salaried 155/330 (47)	High Awareness Category Self Employed 58/114 (51)	Low Awareness Category Other 64/154 (42)				

Table 22 Demographic – Awareness about features while buying card

In this table the resulting mean was compared for each Demographic variable. The result summarized in the table shows the High and low category for the given demographic variables like Age, Gender, Relationship status and Profession. The green in the table shows the highest percentage values while pink shows lower percentage value for respective categories. Awareness about card seems to be higher at teenage. The difference in awareness across gender is negligible when it comes to awareness about card features. Singles and professionals have a great awareness then their counterparts.

8. Banking services usage profile variables and level of awareness - high and low

In the previous section it is clear that the awareness is higher in younger people but the overall awareness is low. This section access is the awareness for particular criteria like food, Transport Etc.

Do you prefer to use debit and credit card for the following		
Variable	Sum	Mean
Food	371	0.62
Transport	275	0.46
Apparel and shopping	282	0.47
Rent	277	0.47
Loan Payment	302	0.51
Electronics	271	0.45
Book Holiday	299	0.50
Others	284	0.48

Table 23 prefer to use debit and credit card for particular category

Table above shows cash intensive economic is evident from all aspects as people are interested in making electric payment using credit card and debit card and means scores are significantly low then many other economies around the globe. The table

shows that a lot needs to be done to increase expenses using electronic media and cards in the country and special emphasis has to be given on payment which of repeat nature like transportation accept as these categories fair very less when compared to others.

Debit Card	0
Credit Card	1
Two or more cards	2

Table 24 Mapping cards to values for analysis

Table above shows the mapping of values for analysis. Items are marked as 0 to 2.

How many times do you use credit or debit card in a week?

Low usage 0 or 1 time	0
Average usage 2 to 7 time	1
>7 time	2

Table 25 Frequency of use or cards

Table above shows that items are marked in ascending order for farther analysis the values are given in the table.

Preference to use card and Card Usage Percentage values are given in brackets.							
Do you use any of the cards	Debit 123/199 (61)	Credit 88/136 (65)	Both cards and multiple cards 167/264 (63)				

Usage frequency	Low usage 0 or 1 time 148/238 (62)	Average usage 2 to 7 time 230/359 (64)	>7 time 1/3 (33)				
Average Expense every Week	Average Spend: 1 - 1000 11/12 (91)	Average Spend: 1000 – 10000 (78)	Average Spend: >10000 (58)				
Do you use credit card to withdraw money	Said yes 250/396 (63)	Said No 128/203 (63)					
Do you always carry your debit or credit with you?	Yes, I always carry both debit and credit card 173/270 (64)	Sometimes I carry one of the cards 5/6 (83)	No response 200/323 (61)				
Duration of use	< 5years 146/222 (66)	>5 years 323/377 (86)					

Table 26 Preference to use card and Card Usage

Table above shows data against cards. There is almost equal spread credit card debit card and people who use both kinds of cards. Maximum frequency of use is in between 2 and 7. Most people Spend Rs. 1000 or less every week. Almost half the user has used cards to

withdraw money. High number of users have responded and said that they carried out sometime and sometimes do not. Large number of card users soon to be using the card for more than 5 years.

9. Possession of multiple cards and influencing factors

Data have been analyzed for single card and it is also important to note that there are many people who have multiple cards. Suitable data analysis has to be carried out on multiple card uses. Present section deals with multiple card users across various categories.

10. Gender and possession of large number of cards (more than one)

Influence of gender having multiple cards in the first factor to be analyzed. The result is given below.

Actual Value	Debit Card or Credit Card (Only One)	Both Debit and credit card (More Than One)	Total
Female	153	117	270
Male	182	147	329
Grand Total	136	98	599

Expected Value	Debit Card or Credit Card (Only One)	Both debit and credit card	
Female	61.30	44.17	
Male	74.70	53.83	

Table 27 Expected and Table 23 Actual values of card use by gender

Degree of freedom $(r-1)(c-1)$ In this case Degree of freedom: 1

This means if we know one of the values in the table the rest of the 3 values in the table can be calculated

p-value 0.00

11. Education and possession of large number of cards (more than one)

Education is the next factor to be analyzed for users having multiple cards. The result is given below.

Similar analysis was done for card users but this section is focused on users who have multiple cards.

Actual Value	Debit Card or Credit Card (Only One)	Both Debit and credit card (More Than One)	Total
B.E. /B. Tech	115	83	198
Graduation and Master	87	74	161
Others	102	69	171
Ph. D	24	36	60
Unanswered	7	2	9
Grand Total	136	98	599

Expected Value	Debit Card or Credit Card (Only One)	Both debit and credit card
B.E. /B. Tech	4971.38	32.39
Graduation and Master	36.55	26.34
Others	38.82	27.98
Ph. D	13.62	9.82
Unanswered	2.04	1.47

Table 28 Actual and expected value of cards by education

12.Occupation and possession of multiple cards (more than one)

Occupation is the next factor to be analyzed for users having multiple cards. The result is given below. Similar analysis was done for card users but this section is focused on users who have multiple cards.

Actual Value	Debit Card or Credit Card (Only One)	Both Debit and credit card (More Than One)	Total
Salaried	177	154	331
Self Employed	65	49	114
Other	93	61	154
Total	335	264	599

Expected Value	Debit Card or Credit Card (Only One)	Both Debit and credit card (More Than One)
Salaried	185.12	145.88
Self Employed	63.76	50.24
Other	86.13	67.87

Table 29 Actual and expected value of cards by employment

13.Age and possession of cards (more than one)

Age is another factor to be analyzed for users having multiple cards. The result is given below. Similar analysis was done for card users and now this section is focused on users who have more than one card.

Actual Value	Debit Card or Credit Card (Only One)	Both Debit and credit card (More Than One)	Total
--------------	--------------------------------------	--	-------

		One)	
Age: 10 - 20	7	2	9
Age: 20 - 30	63	56	119
Age: 30 - 40	51	47	98
Age: 40 - 50	61	51	112
Age: 50 - 60	61	36	97
Age: 60 - 70	60	43	103
Age: 70 - 80	32	29	61
Grand Total	136	264	599

Expected Value	Debit Card or Credit Card (Only One)	Both debit and credit card
Age: 10 - 20	10.29	19.97
Age: 20 - 30	165.14	320.57
Age: 30 - 40	119.00	231.00
Age: 40 - 50	157.03	304.82
Age: 50 - 60	128.08	248.62
Age: 60 - 70	229.64	445.77
Age: 70 - 80	13.85	26.88

Table 30 Actual and expected value of cards by age

Category: Multiple cards		
Significance Level 0.05		
Summary of the points 10 to 13		
Hypothesis Statement	P-Value	Interpret results
Hypothesis HP-0mc: Possession of more than one cards use is not influenced by gender.	0	Reject
Hypothesis HP-1mc: Possession of more than one cards use is influenced by gender.		Accept

Hypothesis HP-0 mc: Possession of more than one card for use is not influenced by education.	0	Reject
Hypothesis HP-1mc: Possession of more than one card for use is influenced by education.		Accept
Hypothesis HP-0mc: Possession of more than one card for use is not influenced by occupation.	0.34	Accept
Hypothesis HP-1mc: Possession of more than one card for use is influenced by occupation.		Reject
Hypothesis HP-0mc: Possession of more than one Plastic money use is not influenced by age.	0	Reject
Hypothesis HP-1mc: Possession of more than one Plastic money use is influenced by age.		Accept

Table 31Hypothesis Testing for Multiple Wallet

14.Correlation

Correlation defines the statistical degree between two variables and provides useful information that can be used to see if the variables are positively or negatively correlated.

A value closer to zero would mean no correlation which R value closer to +/- 1 shows the variables are highly correlated. That would mean that there is a relationship between variables.

Some of the values were coded for processing these include the following as given in the table.

Category	Key
Relationship status?	Single 0

	Married 1
	Other 2
Educational qualification	Graduation / Master Degree / B.E. /B. Tech 0
	Ph.D. 1
	Other 2
Gender	Male 0
	Female 1
Profession	Salaried / work integrated course stipend 0
	Self Employed 1
	Other 2

Table 32 Coding different variables

Table above shows the various categories and the corresponding codes used for analysis.

The following Independent variable are used during the analysis.

1. Educational qualification
2. Relationship status
3. Profession
4. Gender

Dependent variable

1. Frequency of use of Plastic money (Survey question was: How many times do you use credit or debit card in a week?)

The information was used to construct the table given below.

	How many times do you use credit or debit card in a week?	Educational qualification	Relationship status? (optional)	Profession	Gender
How many times do you use credit or debit card in a week?	1				
Educational qualification	-0.01614	1			
Relationship status?	-0.07614	0.007552	1		
Profession	-0.04111	0.037099	0.037837	1	
Gender	0.023803	0.061335	-0.03555	-0.03244	1

Table 33 Correlation table

Table above shows that there is no significant LINEAR RELATION between variables and in other words the change in one variable is unlikely to influence any other variables significantly. Both strength and direction of the variables need not be taken into consideration for further analysis.

Chi-Square test of independence			
Independent Variable:			
Males			
Females			
Dependent Variable:			
Minimal use of plastic money<3 times (Usage per week)			
Usage greater than >3 times			
	Minimal use <3 times	Greater than >3	Row Totals
Male	205 (204.15) [0.00]	64 (64.85) [0.01]	269
Female	157 (157.85) [0.00]	51 (50.15) [0.01]	208
Column Totals	362	115	477 (Grand Total)
The contingency table provides the following information: the observed cell totals, (the expected cell totals) and [the chi-square statistic for each cell] Result calculated using online tool www.socscistatistics.com			
The chi-square statistic is 0.0339. The p-value is .853872.			
Since p value is greater than 0.05, the null hypothesis is accepted. Thus the variables are independent. It means, gender does not influence the frequency of usage of plastic money.			

Table 34 Chi-square test for independence

15. Possession of wallet and influencing factors

This section focuses on the virtual wallet space and carries out similar in-depth analysis as was done for plastic money. First the Virtual Wallet Services involve the gadgets. Statistics about the Gadget, its Use and Benefits have been gauged using various queries.

Give your view on the following Parameters concerning “Why you use Wallet?”		
Category	Sum	Average

Easy payment method	1766	3.12
Safety is paramount	1726	3.05
Open Wallets	1780	3.14
Accessible from laptop and mobile	1786	3.16
Rewards	1635	2.89
Simplicity of use	1672	2.95
Users like Accessibility, easy of payment and open wallets feature that lets them transact across a variety of platforms and from anywhere anytime.		

Table 35 Preference of wallet users

Table above shows the various wallet categories with the sum and average values that indicate the importance of accessibility and ease of use for users. Though most of the values have tendency to be around the mean and the dispersion is not very high in this case, which would mean the users give importance to other categories as well and would probably not use the wallet if any of the standard features and security functions are compromised.

Demographic – Preference for choosing wallet 3.05 (Average) High awareness in green and low awareness in pink							
Age	Age 10 - 20; 9/15 (60)	Age 20 - 30: 55/115(47)	Age 30 - 40: 46/98 (46)	Age 40 - 50: 53/104 (50)	Age 50 - 60: 51/94 (54)	Age 60 - 70: 38/83(45)	Age 70 - 80: 28/57(43)
Relationship status? (optional)	Married 74/153 (48)	single 152/319 (47)	other 48/94 (51)				
Profession	Salaried 142/292 (48)	Self Employed 50/101 (50)	other 73/158 (46)				

Annual income	<3 lakhs 92/183 (50)	Up to 5 lakhs 25/56 (44)	Above 5 lakhs 158/328 (48)
Educational qualification	Graduation and Masters 161/323 (49)	Ph.D. 21/48 (43)	other 92/186 (49)

Table 36 Demographic – Preference for choosing wallet

Table above shows preference for using virtual wallet over other means of payment is average. Young people are more likely to use the wallet specially when in the teen age. Relationship status has less influence on adoption of wallets. Profession can have slight influence. Most wallet users have low income. Education does not seem to influence wallet use significantly.

16. Gender and Preference for particular wallet

To analyze the impact of gender on selected wallets the following analysis were carried out. Some of the primary wallet categories were selected and the actual values for both genders were recorded. Expected values for same categories were also calculated. P value was also calculated to find the significance of gender on selected wallet categories. Generic analysis was done on wallet and in this case test is carried out to check if the user is likely to have many types of wallets.

Actual value	Airtel money	Irctc wallet	M pesa Vodaphone	Other	SBI wallet	Grand Total
Female	62	30	51	94	42	279
Male	62	27	67	81	36	273
Unanswered	2	2	6	3	1	14
Grand Total	126	59	124	178	79	566

Expected	Airtel money	Irctc	M pesa	Other	SBI
----------	--------------	-------	--------	-------	-----

Value		wallet	Vodaphone		wallet
Female	62.10954064	29.08304	61.12367491	87.7	38.9417
Male	60.77385159	28.4576	59.80918728	85.9	38.1042
Unanswered	3.116607774	1.459364	3.067137809	4.4	1.95406

Table 37 Actual and expected preference for wallet

17.Education and Preference for particular wallet

Next education is used to analyze the impact of across selected wallets with the following analysis carried out. The actual value was obtained from the survey and the expected values were calculated manually. The results are given in the table below. P values are obtained for the same scenario to test if the user is likely to have many wallets.

Actual value	Airtel money	Irtc wallet	M pesa Vodaphone	Other	SBI wallet	Grand Total
Graduation and Masters including B. Tech and B.E.	178	84	179	256	109	279
Ph. D	4	6	15	16	7	273
Others	48	18	38	60	22	14
Grand Total	230	108	232	332	138	566

Expected Value	Airtel money	Irtc wallet	M pesa Vodaphone	Other	SBI wallet
Graduation and Masters including B. Tech and B.E.	113.3745583	53.23675	114.360424	164	68.0247
Ph. D	110.9363958	52.09187	111.9010601	160	66.5618
Others	5.689045936	2.671378	5.738515901	8.21	3.41343

Table 38 Actual and expected value of preference for particular wallet by education

18.Occupation and Preference for particular wallet

Next occupation is used to analyze the impact of across selected wallets with the following analysis carried out. The actual value was obtained from the survey and the expected values were calculated manually. The results are given in the table below. P values are obtained for the same scenario to test if the user is likely to have many wallets.

Actual value	Airtel money	Irctc wallet	M pesa Vodaphone	Other	SBI wallet	Grand Total
Salaried	66	30	61	95	40	279
Self Employed	22	11	23	30	15	273
Others	32	17	37	49	23	14
Unanswered	6	1	3	4	1	15
Grand Total	126	59	124	178	79	566

Expected Value	Airtel money	Irctc wallet	M pesa Vodaphone	Other	SBI wallet
Salaried	62.10954064	29.08304	61.12367491	87.7	38.9417
Self Employed	60.77385159	28.4576	59.80918728	85.9	38.1042
Others	3.116607774	1.459364	3.067137809	4.4	1.95406
Unanswered	3.339222615	1.56360424	3.286219081	4.717	2.0936396

Table 39 Actual and expected values of wallet preference by education

19.Age and Preference for particular wallet

Next age is used to analyze the impact of across selected wallets with the following analysis carried out. The actual value was obtained from the survey and the expected values were calculated manually. The results are given in the table below. P values are obtained for the same scenario to test if the user is likely to have many wallets.

Actual value	Airtel money	Irctc wallet	M pesa Vodaphone	Other	SBI wallet	Grand Total
Age: 10 - 20	6	1	3	4	1	15
Age: 20 - 30	34	12	24	34	11	115
Age: 30 - 40	24	10	24	28	12	98
Age: 40 - 50	19	9	22	40	14	104
Age: 50 - 60	21	10	24	23	16	94
Age: 60 - 70	9	9	22	27	16	83

Age: 70 - 80	13	8	5	22	9	57
Grand Total	62	36	73	112	55	566

Expected Value	Airtel money	Irctc wallet	M pesa Vodaphone	Other	SBI wallet
Age: 10 - 20	1.643109541	0.954064	1.934628975	2.97	1.4576
Age: 20 - 30	12.59717314	7.314488	14.83215548	22.8	11.1749
Age: 30 - 40	10.73498233	6.233216	12.63957597	19.4	9.52297
Age: 40 - 50	11.39222615	6.614841	13.41342756	20.6	10.106
Age: 50 - 60	10.29681979	5.978799	12.12367491	18.6	9.13428
Age: 60 - 70	9.091872792	5.279152	10.704947	16.4	8.06537
Age: 70 - 80	6.243816254	3.6254417	7.351590106	11.28	5.5388693

Table 40 Actual and expected values of wallet preference by Age

To analyze the perception and preference of banking customers (both users and non-users of plastic money or virtual wallet services) on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.

Category: Choice of a wallet app		
Significance Level 0.05		
Summary of the Points 16 to 19		
Hypothesis Statement	P-Value	Interpret results
Hypothesis HP-0 wa: Possession of many types of wallet is not influenced by gender.	0.42	Accept
Hypothesis HP-1 wa: Possession of many types of wallet is not influenced by gender.		Reject
Hypothesis HP-0 wa: Education has no influence on the preference for a wallet app	0	Reject

Hypothesis HP-1wa: Education has influence on the preference for wallet app		Accept
Hypothesis HP-0 wa: Profession has no influence on the preference for wallet app	0	Reject
Hypothesis HP-1wa: Profession has influence on the preference for wallet app		Accept
Hypothesis HP-0wa: Age has no influence on the preference for a wallet app .	0	Reject
Hypothesis HP1 wa: Age has influence on the preference for a wallet app .		Accept

Table 41 Hypothesis Testing for Choice of Wallet App

20.Perception of Plastic money holders

Perception of users can be analyzed from multiple angles Satisfaction been one of them. Detailing section checks mean statistics score for Satisfaction. Satisfaction also comes from having left bother about cards and credit rating. This enables are in use of the instrument without much botheration. Following section analyses data received during the final survey for Satisfaction and other factors. Subjects section would also do the same analysis on mobile wallet where in the perception of users of mobile wallets be tested in similar ways.

Frequency of Usage of Credit Cards and Satisfaction - Mean Satisfaction Scores PM				
User response by card type	Count	Average of How many times do you use credit or debit card in a week?	Average level of Satisfaction of users on a count of 1 to5 with 5 being the highest	Median value Satisfaction of users on a count of 1 to5 with 5 being the highest
Debit card	199	2.29	3.2	3

respondent				
Credit card respondent	136	1.98	3.8	3
Debit and credit card respondent	264	1.88	3.02	3
Most of the users use both debit and credit cards and respondents are satisfied using the debit card over the credit card.				

Table 42 Mean Satisfaction Scores Plastic Money

Table shows that most users use both cards and are much more satisfied with debit card done with credit card. This can happen because debit card does not have any implication rather say any negative implication on credit scores. Thus use of debit card and you Satisfaction is directly related provided you have sufficient money in the bank.

Reasons for patronizing and using the same card PM	Count	Inference
Good for online transaction	93	Most of the Indian respondents use the card for transaction and service and do not show lot of concern if service and rating is good.
Always used this bank	80	
Good Service	54	
Good rewards	54	
Have poor credit rating, so cannot go elsewhere	0	
It is linked with my loan	0	
Creating new account is not easy	0	

Table 43 Reasons for patronizing and using the same card

Table shows that most of the users are satisfied with the cards if the services are proper and timely. The card for online transactions having good rewards and services are more likely to retain customers in the long run. Order set of statistics so that uses have been using cards for more than 5 years. All this analysis brings us to the fact that service and rewards are very essential to retain credit card customers.

Frequent Usage of cards PM	Count	Inference
-----------------------------------	--------------	------------------

Transfer Money	163	Most of the respondents have used the card for medical bill payments and followed by shopping. This may be indicating higher health care cost and need for immediate payment in hospitals.
Mobile recharge and online Sales	162	
Entertainment and Luxury item	158	
Shopping in stores	454	
Banking Transaction and trading	161	
Health	483	
Education	150	

Table 44 Frequent Usage of cards per category

Table shows that most of the users use the card for medical purpose for high value transaction which is understood. It is difficult to carry excessive amount of cash. Electronic cards provide convenience and accountability collage payment and that is beneficial for users.

Cards most used during these festivals top 2 PM	Count
Ganesh Chaturthi	212
Diwali	121

Table 45 Usage of cards at festivals

Table gives the seasonal variance and uses specially cards are used during festive season in India. Top two festivals where cards are likely to be used extensively are given in the table.

User by Card Type PM	Count of Are the annual Fees & Other charges good value for money?	Inference
Credit Card	136	Most of the respondents think that the charges on the cards are undesirable and high.
Fees Acceptable	19	
Value for money	20	
Very high charges and fees	34	

Very Undesirable	63	
Debit Card	197	
Fees Acceptable	47	
Value for money	28	
Very high charges and fees	54	
Very Undesirable	68	
Debit Card, Credit Card	263	
Fees Acceptable	52	
Value for money	35	
Very high charges and fees	61	
Very Undesirable	115	
Grand Total	596	

Table 46 Perception on card annual fees

Table shows the analysis of card for annual Court fees for particular user groups and category. Data analyzed in detail digital atypical activities in the regional context. Most of user still feels the charges are exorbitant and there is enough scope for improvement.

User by Card Type PM	Count of Do you always carry your debit or credit with you?	Inference
Credit Card	136	Most of the users carry cards with them.
Others like cash Etc.	77	
Sometimes I carry one of the cards	1	
Yes, I always carry both debit and credit card	58	
Debit Card	198	
Others like cash Etc.	103	
Sometimes I carry one of the cards	3	
Yes, I always carry both debit and credit card	92	
(blank)		
Debit Card, Credit Card	264	
Others like cash Etc.	142	

Sometimes I carry one of the cards	2	
Yes, I always carry both debit and credit card	120	
Grand Total	598	

Table 47 Does users always carry cards

Table gives the analysis and tries to find out if the user always carries the card. each uses are categorized across different card types and also compared with cash. The result analysis course that the regional customer is interested in carrying money I am some time did you carry cards. This by the very nature is natural for a cash rich economy.

User by Card Type PM	Count of Do you make international money transfer using plastic money?	Inference
Credit Card	136	Most of the respondents have not used the cards outside the country and credit cards are used during foreign travels.
Not used outside country	65	
Yes, used outside country	71	
Debit Card	199	
Not used outside country	199	
Debit Card, Credit Card	264	
Not used outside country	128	
Yes, used outside country	136	
Grand Total	599	

Table 48 Making international money transfer using cards

Table clearly shows that the users have not use the card outside county transactions. Most of users may not have travel abroad or might not have imported goods. Users may have carried significant amount of cash along with them during the visit to foreign location and might not have bought high value goods from outside country. Some of the visit may have been sort stay holiday trip while many cards are definitely not suitable for travel. Many cards are also not good for transaction due to high transaction fees and definitely do not offer multicurrency conversion facility.

User by Card Type PM	Count of Do you use any of them	Average of Your Average Credit Card bill for last 6 months?	Average of How many times do you use credit or debit card in a week?	Average of What are your average expense using credit or debit cards?	Average of How long have you been using the cards?	Average of How do you rate the level of your Satisfaction with your Cards?	Sum of Do you use credit card to withdraw money?
Credit Card respondents	136	18191	2.0	9695	8.03	3.08	73
Debit Card respondents	199	0	2.3	9653	7.76	3.20	NA
Debit Card, Credit Card	264	19062	1.9	10121	7.86	3.03	130
Grand Total	599	12532	2.0	9869	7.87	3.10	305
Inference: Respondents have a tendency to use the card and retain the bank accounts they have and have used the credit cards to withdraw money. The average expenditure was higher for people who had both credit and debit cards.							

Table 49 Usage is higher for people who use many cards

Table shows users have a tendency to use the card and retain the bank accounts they have and have used the credit cards to withdraw money. The average expenditure was higher for people who had both credit and debit cards.

User by Card Type PM	Count of Do you use any of them	Sum of Do you use credit card to withdraw money?	Percentage of users using credit card to withdraw money?	Inference
Credit Card Respondents	136	73	53.68	About half of the respondents have used the credit card to withdraw money which is not a good practice.
Debit Card Respondents	199	0	0	
Debit Card and Credit Card	264	130	49.24	
Grand Total	599	305	50.92	

Table 50 Usage of card to withdraw money

Table shows that about half of the respondents have used the credit card to withdraw money which is not a good practice. Education of customers is essential to keep this improper use of cards checked.

User by Card Type PM	Count of Do you use any of them	Average of How many times do you use credit or debit card in a week?	Average of What are your average expenses using credit or debit cards?	Average of How long have you been using the cards?	Average of How do you rate the level of your Satisfaction with your Cards?	Sum of Do you use credit card to withdraw money?	Percentage of users using credit card to withdraw money?
Age: 10 - 20	9	1.7	10495	5.78	3.11	3	33.33
Age: 20 - 30	119	2.3	8514	7.58	3.23	41	34.45
Age: 30 - 40	98	2.2	11464	6.77	3.16	40	40.82
Age: 40 - 50	112	2.0	9465	7.86	3.09	32	28.57
Age: 50 - 60	97	2.0	9784	8.90	2.82	34	35.05
Age: 60 - 70	103	1.9	11303	8.75	3.01	34	33.01
Age: 70 - 80	61	1.8	9073	7.39	3.31	19	31.15
Grand Total	599	2.0	9947	7.87	3.10	203	33.89
Inference: Most of the respondents said they are neither very satisfied nor very sad with the cards which reflect that there is scope for further improvement.							

Table 51 Card statistics by age

In Table shows most of the respondents said they are neither very satisfied nor very sad with the cards which reflect that there is scope for further improvement.

Age Groups PM	Male: Satisfaction with your Cards	Female: Satisfaction with your Cards	Inference
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Age: 10 - 20	3.67	2.83	Males are satisfied with the cards as compared to females in teen and early ages while women are much more content at the 40 to 50 age group. This can be correlated with the spending habits of both the groups.
Age: 20 - 30	3.30	3.17	
Age: 30 - 40	3.23	3.10	
Age: 40 - 50	2.89	3.28	
Age: 50 - 60	3.00	2.70	
Age: 60 - 70	2.86	3.12	
Age: 70 - 80	3.50	3.15	

Table 52 Satisfaction of cards by age

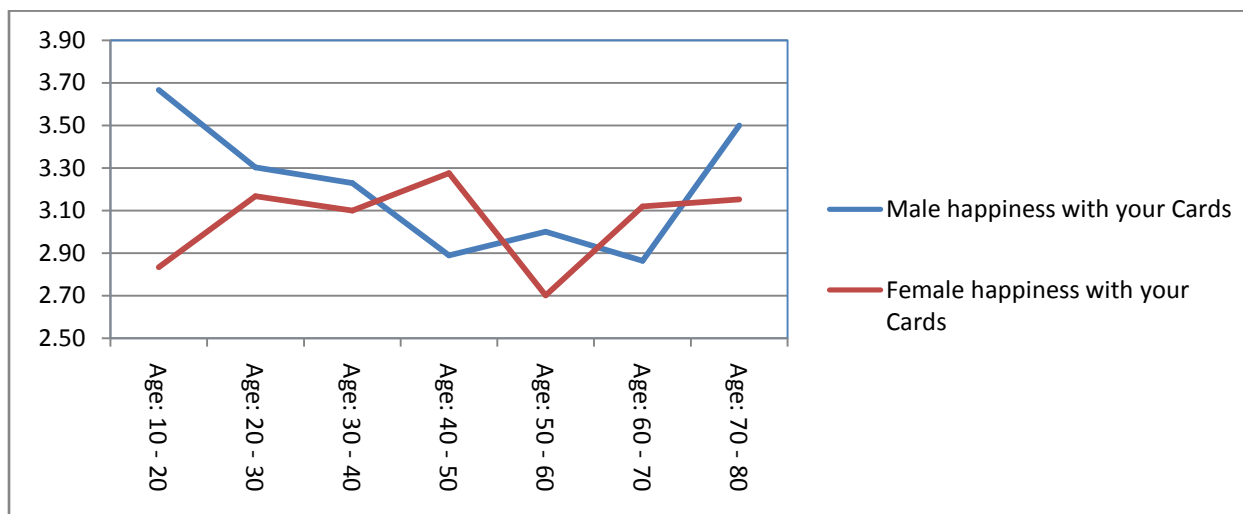


Figure 28 Satisfaction of card by age

Table shows the details on gender Satisfaction in respective age categories. Males are satisfied with the cards as compared to females in teen and early ages while women are much more content at the 40 to 50 age group. This can be correlated with the spending habits of both the groups.

Average of What are your average expenses using credit or debit cards? PM							
Row Labels	Graduation	Master Degree	Others	Ph. D	(blank)	B.E. /B.Tech.	Grand Total
Female	8104	25000	10131	8677	10887	10861	9828
Age: 10 - 20					10887		10887
Age: 20 - 30	4411	25000	11696	8885		6428	8207
Age: 30 - 40	6932		8627	9113		10118	8936
Age: 40 - 50	8745		11580	8730		10100	10168
Age: 50 - 60	13619		10167	5921		16833	13125
Age: 60 - 70	11266		8216	9956		9815	9652

Age: 70 - 80	6587		8991	8497		10610	9220
Male	8496	3200	9776	8306	13931	11523	9810
Age: 10 - 20					13931		13931
Age: 20 - 30	8576	3000	12082	7737		14547	10858
Age: 30 - 40	7299	4000	8291	9361		11964	9178
Age: 40 - 50	9314	2000	10367	9252		12473	10344
Age: 50 - 60	9078		8999	4295		10199	8947
Age: 60 - 70	7839		8932	10932		11033	9819
Age: 70 - 80	8668		9467	7941		7173	8462
Grand Total	8337	6833	9954	8467	12916	11219	9818
Inference: Among the respondents the majorities were graduates and many of the respondents did not reveal their qualification. But around 40 percent of users shared the card with someone like parents, spouse and others which would mean that the spending patterns would not be clearly evident by age groups or gender.							

Table 53Average card expense by gender and age

Table shows among the respondents the majorities were graduates and many of the respondents did not reveal their qualification. But around 40 percent of users shared the card with someone like parents, spouse and others which would mean that the spending patterns would not be clearly evident by age groups or gender.

Count of Who uses your card? PM									
Count of Age Histogram	Age: 10 - 20	Age: 20 - 30	Age: 30 - 40	Age: 40 - 50	Age: 50 - 60	Age: 60 - 70	Age: 70 - 80	Grand Total	Percentage of uses who shared the card with someone
Female	3	43	48	54	33	33	21	235	
Not Answered	3	25	22	32	22	24	10	138	
Parents		12	13	9	6	4	3	47	8.99
Spouse		6	13	13	5	5	8	50	9.56
Male	6	62	48	58	39	47	28	288	
Not Answered	3	31	31	32	25	31	22	175	
Parents	1	17	9	13	4	9	4	57	10.90
Spouse	2	14	8	13	10	7	2	56	10.71
Grand	9	105	96	112	72	80	49	523	40.15

Total									
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Table 54 who uses your card?

Table shows that a significant number of users share the cards with relatives, parents and spouses in the regional area. It is not clear if the users are present while doing such transactions or not but this figure is not indication of good practice and can expose the user to misuse.

Do you know the factors to look at before you apply for Credit Card in India? PM	Count	Inference
Interest rate charged	247	
Annual Fees & Other charges	413	Top 3 factor people look for while getting credit card
Rewards and Offers on Card	404	Top 3 factor people look for while getting credit card
Customer Service and Transparency	246	
Convenience to pay the bills	405	Top 3 factor people look for while getting credit card

Table 55 Awareness about factors while applying for card

Table fgives top three factors which for which people look into while buying cards like annual fees, rewards and convenience.

Why do people use the same bank? PM		
Reason	No of respondents who are loyal to the bank	Inference
Good for online transaction	402	Good online transactions, Long association with bank, good service are the top three reasons why the respondents keep using the same bank.
Always used this bank	344	
Good Service	249	
Good rewards	242	

Creating new account is not easy	3	
Have poor credit rating, so cannot go elsewhere	0	
It is linked with my loan	0	

Table 56 Why do people use the same bank

Table shows the reason while people use the same bank. Good service, relationship and faith definitely score when it comes to retaining customers.

What do you do to secure your card? PM	Response of 599 users on multiple choice query	Inference
Block card when phone is stolen	396	Top three choice to secure the card
Set Transaction alerts	394	Top three choice to secure the card
Set Transaction password	392	Top three choice to secure the card
Memorize CCV number	257	
Use Images	249	
Access website link directly	233	
User virtual keyboard	205	
Fix limit on card	189	
Do not have photocopy of card	135	
User virtual card	113	

Table 57 What users do to secure the card?

Table shows what users do when the cards are stolen, lost or compromised. Most people block cards. This data shows what they do to keep themselves secure. Transaction alters and passwords are primary security feature regularly used by customers. Other factors are used less frequently to secure the cards.

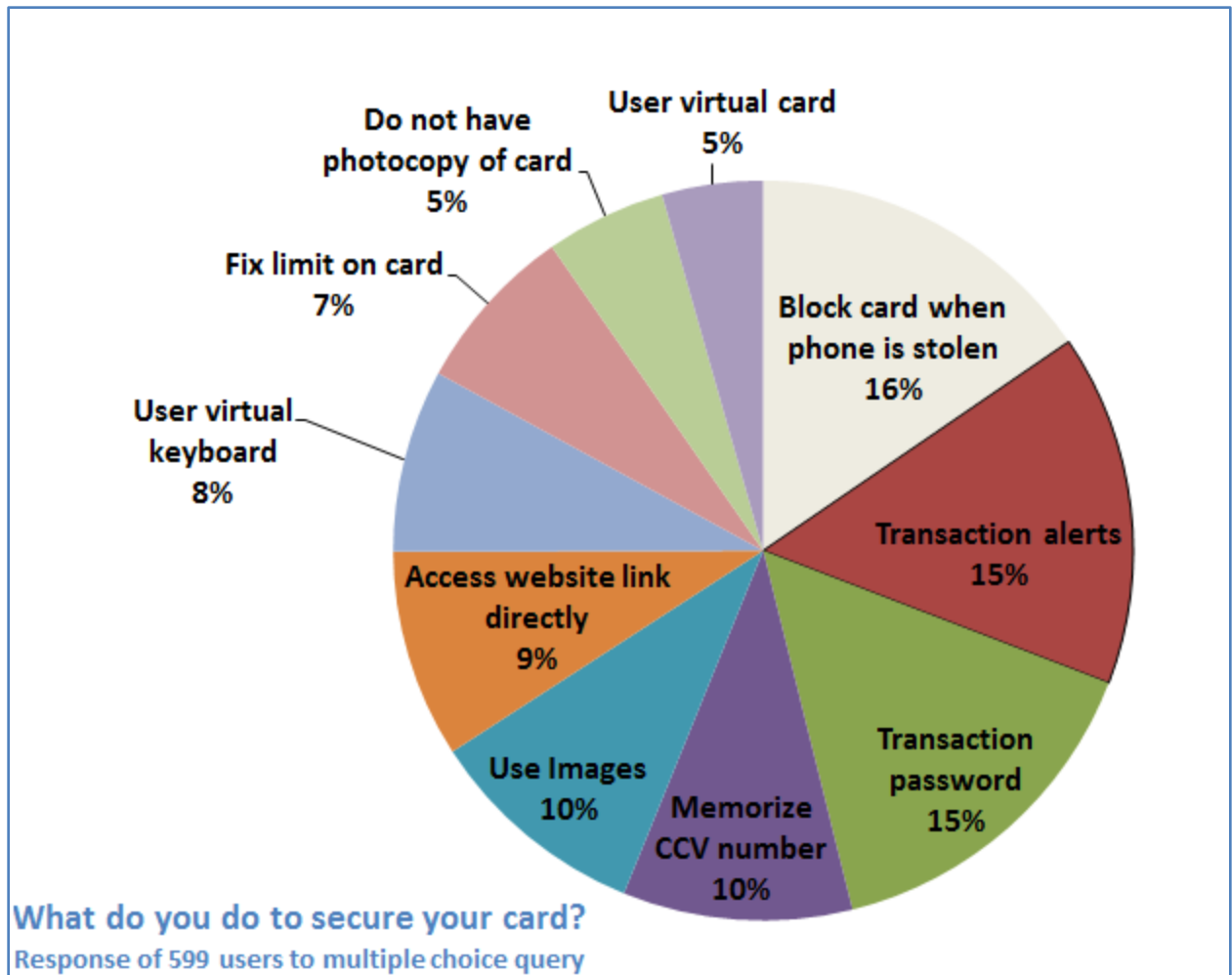


Figure 29 What users do to secure the card

What is your financial goal this year? PM	Count of No	Inference
Saving for future	293	Most of the respondents would like to save for the future.
Pay off debt	126	
Improve credit rating	107	
Car / home/ personal Loan	72	
(blank)	1	
Grand Total	599	

Table 58 Users financial goals

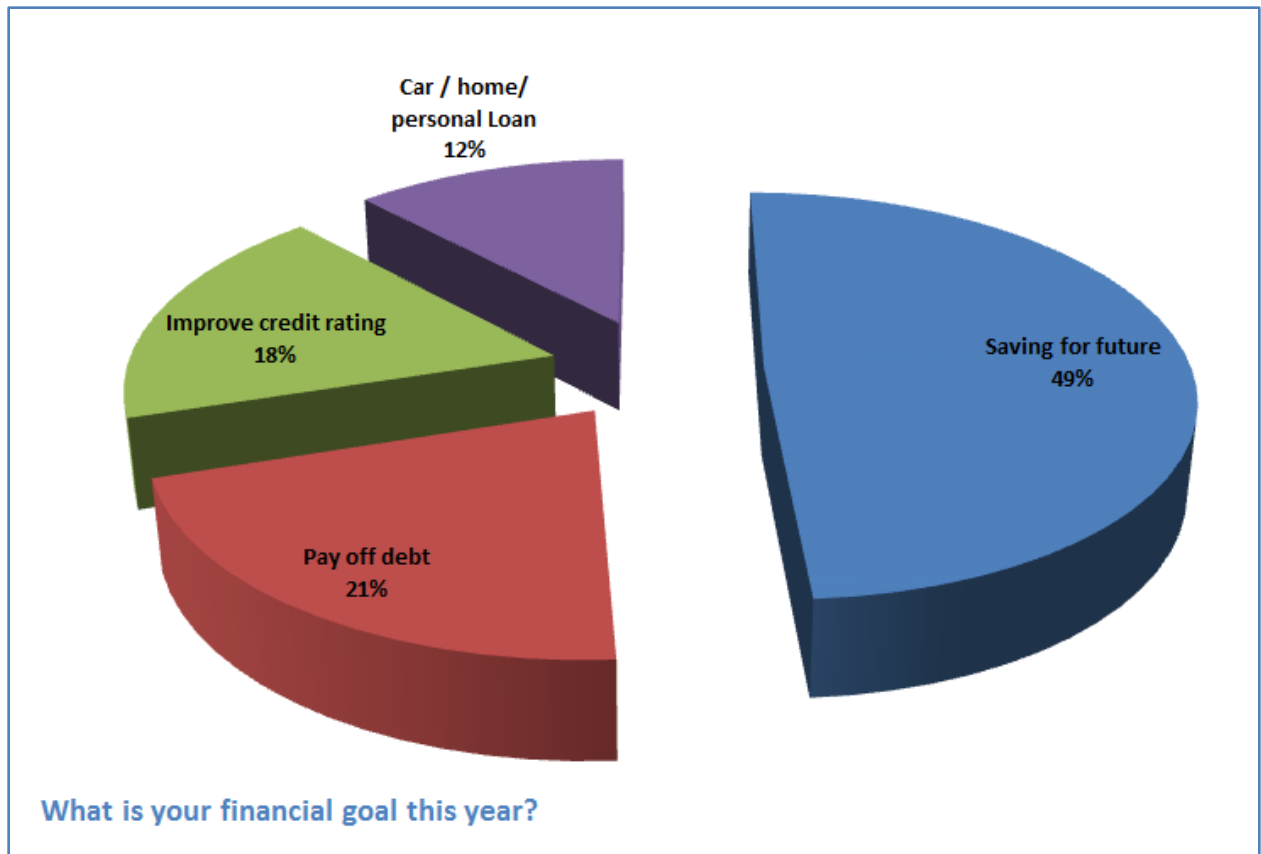


Figure 30 Users financial Goal

Table shows why the users behave in particular pattern and it seems that most of the users are trying to save for future. This is a significant finding as it explains many phenomena. Many of these card payments may be used to secure Fix deposits or make transactions to buy shares etc. These may be used to buy property as well. All these factors lead to high payment even though the cards are used relatively lesser every week.

Count of Do you feel, you are stuck with your bank? If yes, why do you think so?			
PM			
Count of Age Histogram	Female	Male	Grand Total
Age: 10 - 20	3	6	9
Age: 20 - 30	51	65	116
Age: 30 - 40	48	50	98
Age: 40 - 50	54	57	111
Age: 50 - 60	40	57	97
Age: 60 - 70	44	59	103
Age: 70 - 80	28	33	61
Grand Total	268	327	595
Percentage	45.04	54.96	
Inference: 54 percent males and 45 percent of female respondents feel they are stuck with the bank.			

Table 59 User perception if they feel they are stuck with the bank

Table shows that 54 percent males and 45 percent of female respondents feel they are stuck with the bank. This shows that there is relative resentment with the banks performance which may be due to cost of service, poor quality or delay in service.

Sum of Do you prefer to use debit and Credit Card for the following PM							
Count of Age Histogram	Transport	Others	Apparel and shopping	Book Holiday	Rent	Loan Payment	Electronics
Age: 10 - 20	13	11	12	13	13	14	12
Age: 20 - 30	172	165	173	172	158	163	169
Age: 30 - 40	138	139	140	149	141	150	144
Age: 40 - 50	163	165	169	165	154	166	162
Age: 50 - 60	137	141	142	143	153	146	139
Age: 60 - 70	153	156	153	161	152	158	150
Age: 70 - 80	94	93	90	91	96	93	91
Grand Total	870	870	879	894	867	890	867
Inference: Loan Payment and Booking holidays are the top two reasons for using debit and credit card.							

Table 60 Another view of what the people do with cards by age

Table shows loan Payment and Booking holidays are the top two reasons for using debit and credit card.

Count of Do you buy more when you get discount coupons? PM			
Count of Age Histogram	No	Yes	Grand Total
Age: 10 - 20	7	2	9
Age: 20 - 30	56	63	119
Age: 30 - 40	44	54	98
Age: 40 - 50	52	60	112
Age: 50 - 60	53	44	97
Age: 60 - 70	52	51	103
Age: 70 - 80	27	34	61
Grand Total	291	308	599
Inference: People buy more when they get discount coupons.			

Table Users buying preference on discounts. shows that the users of cards buy more on discounts and when they get more discount coupons.

Count of Do you know your credit score? PM				
Count of Age Histogram	No	Yes	(blank)	Grand Total
Age: 10 - 20	3	6		9
Age: 20 - 30	68	50		118
Age: 30 - 40	49	49		98
Age: 40 - 50	58	54		112
Age: 50 - 60	45	52		97
Age: 60 - 70	50	53		103
Age: 70 - 80	34	27		61
Grand Total	307	291		598
Inference: Most of the respondents do not know their credit score				

Table 61 Awareness on credit score by age

Table gives age wise breakup of credit score awareness. It is earlier concluded that most people are not aware of credit score and a deeper analysis reveal two facts that teenagers care less for the credit score and very senior citizens are likely to be more like teens and less interested in credit scores.

21.Perception of Virtual card holders

In line with the survey finding of section 7.7 which was done for plastic money users, this section deals with the perception of virtual wallet users and the survey findings.

The first few selected wallets are chosen for convenience. **SBI wallet is chosen as SBI is the largest bank. Vodaphone is one of the largest mobile service provider across the world. Airtel was the first to offer mobile services in India and IRCTC is the most prominent and frequently used online portal. Rest everything is put in the others category.**

Which mobile wallet is used M	Count	Percentage
Airtel money	126	22.26
Irctc wallet	59	10.42
M pesa Vodaphone	124	21.91
Other	178	31.45
SBI wallet	79	13.96
Grand Total	566	100

Table 62 Snapshot of few mobile wallets used by respondents

Table gives the snapshot of percentage of users who use these selected mobile payment apps. Most of the users have Airtel which is the first prominent wallet service and the other category.

Age M	Average of How many times do you use mobile wallet in a week?
Age: 10 - 20	5.27
Age: 20 - 30	10.39
Age: 30 - 40	10.80
Age: 40 - 50	11.01
Age: 50 - 60	10.28
Age: 60 - 70	10.95
Age: 70 - 80	9.67
Grand Total	10.43

Table 63 Virtual Wallet usage per week

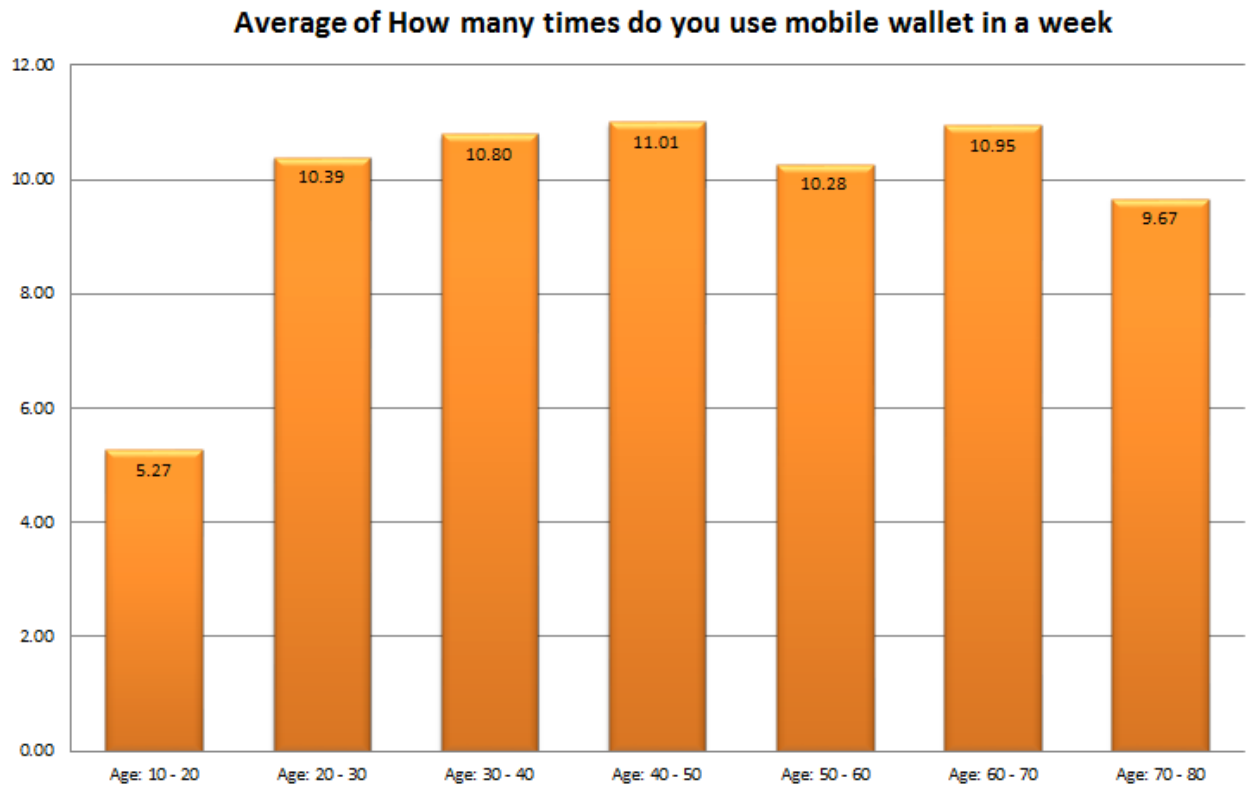


Figure 31 Virtual wallet usage per week

Table shows the virtual wallet usage every week and is more or less similar across age categories.

Age M	Average of What is your average spent using mobile wallet per week? (Rs)
Age: 10 - 20	322.00
Age: 20 - 30	931.83
Age: 30 - 40	1088.88
Age: 40 - 50	1002.50
Age: 50 - 60	1015.53
Age: 60 -	1082.17

70	
Age: 70 - 80	1078.77
Grand Total	1006.59

Table 64 Average spend of Wallet by Age

Which feature excites you the most in mobile wallet? M								
Age	Age: 10 - 20	Age: 20 - 30	Age: 30 - 40	Age: 40 - 50	Age: 50 - 60	Age: 60 - 70	Age: 70 - 80	Grand Total
Other	7	26	32	28	31	20	21	165
Available anytime	1	19	11	17	18	12	9	87
Convenient	6	38	24	25	19	26	14	152
Ease of Use		18	20	24	16	11	12	101
Instant Pay	1	14	11	10	10	14	1	61
Grand Total	15.00	115.00	98.00	104.00	94.00	83.00	57.00	566.00

Table 65 Exciting features of wallet

Table shows that the most users look for convenience and ease of use as the primary reason for using wallets and are excited to use the features that enable these.

Count of for what do you pay using mobile wallet? M								
Age	Age: 10 - 20	Age: 20 - 30	Age: 30 - 40	Age: 40 - 50	Age: 50 - 60	Age: 60 - 70	Age: 70 - 80	Grand Total
Other	2	11	13	7	16	9	6	64
Apparel and shopping	2	12	14	16	9	14	6	73
Book Holiday		2	9	3	3	3	2	22
Electronic		11	6	9	8	7	8	49
Food	4	34	23	35	19	16	15	146
Loan payment	2	10	9	8	6	4	3	42
Rent	2	4	7	10	13	13	7	56
Transport	3	31	17	16	20	17	10	114
Grand Total	15	115	98	104	94	83	57	566

Table 66 Count of for what do you pay using mobile wallet

Table shows that most people pay for food and transport using wallets but the distribution is skewed. Teens have lower averages than other age groups.

Count of Do you use wallet for shopping? M								
Age	Age: 10 – 20	Age: 20 - 30	Age: 30 - 40	Age: 40 - 50	Age: 50 - 60	Age: 60 - 70	Age: 70 - 80	Grand Total
No	9	63	53	49	51	36	31	292
Yes	6	52	45	55	43	47	26	274
Grand Total	15	115	98	104	94	83	57	566

Table 67 Count of Do you use wallet for shopping

Table checks if the wallets are used extensively for shopping just like plastic money. At the time of survey there are almost equal number of users who use the wallets for shopping and who do not. So plastic money has more prominence in the shopping space when compared with previous data set collected for plastic money.

Count of Give your view on the following Parameters concerning “Why you use Wallet?” M	
Age	Use for one of these Easy payment method Safety is paramount Simplicity of use Open Wallets Accessible from laptop and mobile Rewards
Age: 10 - 20	15
Age: 20 - 30	115
Age: 30 - 40	98
Age: 40 - 50	104
Age: 50 - 60	94
Age: 60 - 70	83

Age: 70 - 80	57
Grand Total	566

Table 68 Count of why people use wallet by age

Table gives the count of people across age groups and various factors. The values are used to show the count of respondents. No other conclusion is to be drawn from this data set. Subsequent analysis is given below.

Count of Are the annual Fees & Other charges good value for money? M								
Age	Age: 10 - 20	Age: 20 - 30	Age: 30 - 40	Age: 40 - 50	Age: 50 - 60	Age: 60 - 70	Age: 70 - 80	Grand Total
Fees Acceptable	1	25	18	24	19	21	7	115
Value for money	4	29	28	25	23	18	16	143
Very high charges and fees	10	61	52	55	52	44	34	308
Grand Total	15	115	98	104	94	83	57	566

Table 69 Perception of user on wallet charges

Table gives if the user is ok with the fees charged while using wallets or not. Teenagers are least satisfied with the charges on wallets and do not find it acceptable. People in age group or 20 to 60 are reasonably ok with charges and 60 plus people are not satisfied about the charges.

Average of How confident are you that your personal information will not be stolen? M								
Age	Age: 10 - 20	Age: 20 - 30	Age: 30 - 40	Age: 40 - 50	Age: 50 - 60	Age: 60 - 70	Age: 70 - 80	Grand Total
1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4

5	5	5	5	5	5	5	5	5
Grand Total	2.73	2.81	3.19	3.03	3.06	3.20	2.67	3.00

Table 70 Perception on security in wallet

Table shows that most of the users are not confident that the information is safe. Most people feel it is equally likely that the information would be stolen.

Sum of How do you rate the following parameters while applying for credit and debit cards. PM								
Age Range	EMI option	Easy payment method	Supported by most vendors	Safety is paramount	Rewards	Simplicity of use	Fuel surcharge waver	Great offers
Age: 10 - 20	30	24	28	17	28	29	29	34
Age: 20 - 30	337	341	336	364	343	364	334	354
Age: 30 - 40	288	273	289	312	265	271	306	281
Age: 40 - 50	316	312	343	334	314	320	316	330
Age: 50 - 60	285	295	275	274	292	277	271	263
Age: 60 - 70	268	277	296	299	294	300	293	248
Age: 70 - 80	169	144	175	176	198	188	184	158
Grand Total	1693	1666	1742	1776	1734	1749	1733	1668

Table 71 How do users rate factors while using wallet

Table is an analogy of an earlier table and gives the grand total across various age groups for plastic money and previous table was for virtual wallets security. One thing that comes out is the concern for security is a constant worry for users across different methods of payments.

Do you carry the Wallet? M	Average of How confident are you that your personal information will not be stolen? Rating of 1 to 5 of which 1 being the set of people who thought "Data would not be stolen"	Count of Do you always carry your mobile wallet with you?	Percentage of people who always carry your mobile wallet	Inference
No, Never	3.01	132	23.32	People who are worried of security do not carry the card
Age: 10 - 20	2.75	4	0.71	
Age: 20 - 30	3.15	33	5.83	
Age: 30 - 40	2.88	32	5.65	
Age: 40 - 50	3.04	24	4.24	
Age: 50 - 60	2.92	13	2.30	
Age: 60 - 70	3.47	17	3.00	
Age: 70 - 80	2.22	9	1.59	
Sometimes	3.18	146	25.80	People who are worried of security avoid carrying the card
Age: 10 - 20	3.00	3	0.53	
Age: 20 - 30	2.93	27	4.77	
Age: 30 - 40	3.67	24	4.24	
Age: 40 - 50	3.03	29	5.12	
Age: 50 - 60	3.38	26	4.59	
Age: 60 - 70	2.95	22	3.89	
Age: 70 -	3.13	15	2.65	

80				
Yes, Always	2.91	288	50.88	People who are less worried of security avoid carry the card
Age: 10 - 20	2.63	8	1.41	
Age: 20 - 30	2.55	55	9.72	Young and a section of mid age people are more confident in carrying and using the card
Age: 30 - 40	3.17	42	7.42	
Age: 40 - 50	3.02	51	9.01	
Age: 50 - 60	2.95	55	9.72	
Age: 60 - 70	3.23	44	7.77	
Age: 70 - 80	2.58	33	5.83	
Grand Total	3.00	566	100	

Table 721 Perception on use and caring the wallet.

Table above shows Young and a section of mid age people are more confident in carrying and using the card.

Do you feel information is secure? Row Labels M	Count of Is it easy to buy mobile wallet and load money?	Percentage of people who feel it is easy to buy and load mobile wallet	Inference
No	276	48.76	Roughly Equal number of people are divided in opinion and so it may be the lack of education that people have difficulty in buying and loading mobile wallet
Age: 10 - 20	10	1.77	
Age: 20 - 30	56	9.89	
Age: 30 - 40	50	8.83	
Age: 40 - 50	45	7.95	
Age: 50 - 60	44	7.77	
Age: 60 - 70	43	7.60	

Age: 70 - 80	28	4.95
Yes	290	51.24
Age: 10 - 20	5	0.88
Age: 20 - 30	59	10.42
Age: 30 - 40	48	8.48
Age: 40 - 50	59	10.42
Age: 50 - 60	50	8.83
Age: 60 - 70	40	7.07
Age: 70 - 80	29	5.12
Grand Total	566	100

Table 73 Perception in wallet buying and ease of loading cash

Table above shows that the users are roughly Equal in number and are divided in opinion and so it may be the lack of education that people have difficulty in buying and loading mobile wallet.

Row Labels M	Count of Do you make intentional money transfer using wallet?	Percentage of people who make international money transfer using mobile Wallet	Inference
No	566	100.00	Mobile users make No direct or indirect

			international purchase with mobile wallet. This feature is required in mobile wallet
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Table 74 International purchase using wallet

Table above shows no international transfer is done using mobile wallets. Such feature may be missing in most/ all wallets.

Row Labels M	Count of Do you buy more when you get discount coupons?	Inference
No	284	There is equally likely chance of using the mobile wallet with or without discount coupons.
Age: 10 - 20	7	
Age: 20 - 30	62	
Age: 30 - 40	46	
Age: 40 - 50	51	
Age: 50 - 60	40	
Age: 60 - 70	46	
Age: 70 - 80	32	
Yes	282	
Age: 10 - 20	8	
Age: 20 - 30	53	
Age: 30 - 40	52	
Age: 40 - 50	53	
Age: 50 - 60	54	
Age: 60 - 70	37	
Age: 70 - 80	25	

Grand Total	566
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Table 75 Likely chance of using mobile with discounts

Table above shows there is equally likely chance of using the mobile wallet with or without discount coupons. Yes, count is 282 while no count is 284.

Row Labels M		Banking Transaction and trading	Education	Entertainment and Luxury item	Health	Mobile recharge and online Sales	Shopping in stores	Transfer Money	Grand Total
Age: 10 - 20	2	2		2		5		4	15
Age: 20 - 30	16	8	3	21	9	15	13	30	115
Age: 30 - 40	10	7	7	16	5	19	8	26	98
Age: 40 - 50	16	7	8	13	7	18	16	19	104
Age: 50 - 60	10	7	5	25	3	15	10	19	94
Age: 60 - 70	11	7	3	11	7	19	3	22	83
Age: 70 - 80	5	2	2	10	3	10	10	15	57
Grand Total	70	40	28	98	34	101	60	135	566

Transfer Money, Mobile recharge and Banking transactions are top three uses of Mobile wallet as stated by respondents

Table 76 Usage of wallet feature by age

Table above shows that Transfer Money, Mobile recharge and Banking transactions are top three uses of Mobile wallet as stated by respondents. This is also similar in pattern across age groups.

Sum of Give your view on the following Parameters concerning “Why you use Wallet?”								
Row Labels M	Easy payment method	Rewards	Simplicity of use	Safety is paramount	Open Wallets	Accessible from laptop and mobile	Total	Inference
Age: 10 - 20	53	45	49	46	45	52	290	The younger generation is looking for more features.
Age: 20 - 30	352	333	356	379	374	343	2137	
Age: 30 - 40	290	256	290	299	332	329	1796	
Age: 40 - 50	314	292	317	312	306	319	1860	
Age: 50 - 60	312	317	265	271	301	291	1757	
Age: 60 - 70	264	225	226	253	243	262	1473	
Age: 70 - 80	181	167	169	166	179	190	1052	
Grand Total	1766	1635	1672	1726	1780	1786		

Table 77 View of people preference for wallet features

Table above totals of 2137 in Age: 20 – 30 shows the younger generation is looking for more features. It also shows 1786 as Accessible from laptop and mobile a key factor in wallet use.

What Do you use the Wallet for? M	Apparel and shopping	Book Holiday	Electronic	Food	Loan payment	Rent	Transport	Grand Total	Inference
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Age: 10 - 20	2			4	2	2	3	15	Transport, shopping and food are the top three usages of mobile wallets. So booking cabs using wallet and similar services are gaining traction.
Age: 20 - 30	12	2	11	34	10	4	31	115	
Age: 30 - 40	14	9	6	23	9	7	17	98	
Age: 40 - 50	16	3	9	35	8	10	16	104	
Age: 50 - 60	9	3	8	19	6	13	20	94	
Age: 60 - 70	14	3	7	16	4	13	17	83	
Age: 70 - 80	6	2	8	15	3	7	10	57	
Grand Total	73	22	49	146	42	56	114	566	

Table 78 View of wallet usage on age

Table above shows Transport, shopping and food are the top three usages of mobile wallets. So booking cabs using wallet and similar services are gaining traction.

Count of Which feature excites you the most in mobile wallet? M	Other	Available anytime	Convenient	Ease of Use	Instant Pay	Grand Total	Inference
Age: 10 - 20	7	1	6		1	15	Convenient and Availability followed by ease of use are the top three features that excited the users.
Age: 20 - 30	26	19	38	18	14	115	
Age: 30 - 40	32	11	24	20	11	98	
Age: 40 - 50	28	17	25	24	10	104	
Age: 50 - 60	31	18	19	16	10	94	
Age: 60 - 70	20	12	26	11	14	83	
Age: 70 - 80	21	9	14	12	1	57	
Grand Total	165	87	152	101	61	566	

Table 79 User perception on convenience and availability factors of wallet

Table talks of existing features that are there/upcoming/emerging. The feature categories that user are looking forward to enable Convenient and Availability followed by ease of use where the grand total value is the highest.

ANOVA

To check if relationship status determines how confident are you that your personal information will not be stolen?

Anova: Single
Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Married	153	464	3.03268	2.097609
Single	319	968	3.034483	1.939059
Other	94	266	2.829787	2.207275

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3.266113	2	1.633057	0.805982	0.447164	3.011729
Within Groups	1140.734	563	2.02617			
Total	1144	565				

Table 80 ANOVA calculation on how confident people are of wallet security

Conclusion: if $F < F_{crit}$, we accept the null hypothesis. This is the case, $0.805 < 3.011$. Therefore, we accept the null hypothesis. The means of the three populations (single, married and others) are all equal.

So relationship status does not determine the perception of user towards security when it comes to mobile wallet.

ANOVA

How many times do you use mobile wallet in a week? on Relationship Status

Anova: Single Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
Married	153	1686	11.01961	37.42724
Single	319	3232	10.13166	32.94487
Other	94	985	10.47872	32.83288

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	81.8043	2	40.90215	1.198193	0.302507	3.011729
Within Groups	19218.87	563	34.13653			
Total	19300.67	565				

Table 81 ANOVA on frequency of usage of wallet by relationship status

Conclusion: if $F < F_{crit}$, we accept the null hypothesis. This is the case $1.198 < 3.011$. Therefore, we accept the null hypothesis. The means of the three populations are all equal.

So relationship status does not determine the frequency of usage.

5. To identify, on the basis of analysis of perception, the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.

Descriptive Statistic and Single Factor Anova on Spend every week on wallet vs cards

<i>What is your average spent using mobile wallet every week?</i>		<i>What is your average expenses using credit or debit cards every week?</i>	
Mean	1006.59	Mean	9926.22
Standard Error	24.52	Standard Error	401.29
Median	1010.00	Median	5882.35
Mode	190.00	Mode	5000.00
Standard Deviation	583.25	Standard Deviation	9821.44
Sample Variance	340182.16	Sample Variance	96460722.61
Kurtosis	-1.31	Kurtosis	6.33
Skewness	-0.01	Skewness	2.44
Range	1940.00	Range	49900.00
Minimum	50.00	Minimum	100.00
Maximum	1990.00	Maximum	50000.00
Sum	569730.00	Sum	5945808.51
Count	566.00	Count	599.00
Confidence Level (95.0%)	48.15	Confidence Level (95.0%)	788.12

Table 82 Descriptive Statistic and Single Factor Anova on Spend every week on wallet vs cards

Table compares values across mobile wallet and plastic money. The sample variance for plastic money for exceeds mobile wallet. Total spending is must for mobile wallet as

during the course of the survey. Minimum number across the two categories. The maximum value differs significantly. Latest by the standard deviation values is very hard for plastic money as against mobile wallets. So the spending habits of the people access that way that is used for low value transactions.

ANOVA: Single
Factor

SUMMARY

<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>
410	319	325000	1018.809	333520
100	319	3357308	10524.48	1.09E+08

ANOVA

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	14412052182	2	7.21E+09	131.2922	1.90216E-48	3.00991
Within Groups	34852231988	635	54885405			
Total	49264284170	637				

Table 83 ANOVA on average mobile spend

Table give the average mobile spend and F critical value is 3. Test carried out assert F test and T test the conclusion is given below.

F-Test Two-Sample for Variances

	<i>What is your average expenses using credit or debit cards every week?2</i>	<i>What is your average spent using mobile wallet every week?</i>
Mean	9926.224555	1006.59
Variance	96460722.61	340182.2
Observations	599	566
Df	598	565
F	283.5560905	
P(F<=f) one-tail	0	
F Critical one-tail	1.146531793	

Table 84 F test on Average wallet spend

Conclusion: if $F > F_{\text{Critical one-tail}}$, we reject the null hypothesis. This is the case, $283 > 1.4$. Therefore, we reject the null hypothesis. The variances of the two populations are unequal.

t-Test: Two-Sample Assuming Unequal Variances

	<i>What is your average expenses using credit or debit cards every week?2</i>	<i>What is your average spent using mobile wallet every week?</i>
Mean	9926.224555	1006.59
Variance	96460722.61	340182.2
Observations	599	566
Hypothesized Mean Difference	0	
Df	602	
t Stat	22.18586017	
P(T<=t) one-tail	1.87277E-80	
t Critical one-tail	1.647388728	
P(T<=t) two-tail	3.74554E-80	
t Critical two-tail	1.963912434	

Table 85 T test on Sample

Conclusion: We do a two-tail test (inequality). If $t_{\text{Stat}} < -t_{\text{Critical two-tail}}$ or $t_{\text{Stat}} > t_{\text{Critical two-tail}}$, we reject the null hypothesis. This is not the case, $-1.96 < 22.18$ and $22.18 > 1.96$. Therefore, we reject the null hypothesis. The observed difference between the sample means (9926-1006) is convincing enough to say that the average money spent per week on mobile wallet and cards differ significantly.

Conventional test cannot be done for the analysis as Plastic money is well established as compared to wallet. The evolution in technology is adding new dimension to this scenario.

MEAN Score:		
	Expense	
	Plastic money	Wallet
Age	45.50	46.28
Expenditure	9926.22	1006.59

As of today the Wallet is gaining traction and has gained an impressive average expense value over a very short time. Plastic money has been around for more than half century while wallet in India has been around for less than 5 years.

Comparing the average age of the people using wallet during the survey shows that the average age of both the user base is comparable which would also point to similar user base but the median is higher for mobile users showing the prevalent use of mobile wallet by higher age group which has larger income at disposal.

Data should be normalized because the mobile wallet is a relative new phenomenon. Means score and comparison can you bring out the differences in the two categories.

<i>Age -Mobile User</i>		<i>Age- Plastic Money User</i>	
Mean	45.50	Mean	46.28
Standard Error	0.71	Standard Error	0.68
Median	45.50	Median	46.00
Mode	37.00	Mode	23.00

Table 86 Statistics on Plastic money and wallet

Table gives age comparison for mobile user and plastic money users. Most of the statistics including mean standard error and mediation have similar value. Mod is significantly different for plastic money at age 23 mobile user it is 37. This may indicate that virtual money in mobile wallets is predominantly used by people who have just joint business or service.

22. Analytical Techniques

Most of the factors covered already covered can be grouped into particular categories to arrive at particular conclusions with regards to economics factors and other variables.

The data set is rearranged and the outcome revisited suitable conclusion.

23.Economic factors like Growth and Saving.

Economic factor first actor to be analyzed from a different angle to check the growth and savings and its influence.

Income	Average Spend Mobile	Saving and Growth Potential Mobile User	Rank Mobile User Saving and Growth Potential	Average Spend Plastic Money	Saving and Growth Potential Plastic Money User	Rank Plastic Money User Saving and Growth Potential
1 to 3 lakh	9770.58	98%	1	1023.55	102%	1
3 to 5 lakh	9841.53	198%	2	983.75	195%	2
5 to 10 lakh	10106.16	305%	3	1028.96	307%	3
10 lakhs and above	9442.15	380%	4	1022.32	406%	4
Unanswered	10392.85			972.23		
Grand Total	9926.22			1006.59		
The spending of the set of users using wallet and plastic money does not show huge variation with the increase in salary. This indicates the lifestyle and ways of spending, particularly the huge preference for cash over other ways like mobile and Plastic money.						

The descriptive statistics show very large sample variance for Plastic money vs Mobile. This may be attributed to the user's preference for cash in Indian economy.

Table 87 Saving propensity by income

Table above shows the spending of the set of users using wallet and plastic money does not show huge variation with the increase in salary. This indicates the lifestyle and ways of spending, particularly the huge preference for cash over other ways like mobile and Plastic money.

Descriptive Stats		
	Plastic Money	Mobile Wallet
Mean	9926.22	1006.59
Standard Error	401.29	24.52
Median	5882.35	1010.00
Mode	5000.00	190.00
Standard Deviation	9821.44	583.25
Sample Variance	96460722.61	340182.16
Kurtosis	6.33	-1.31
Skewness	2.44	-0.01
Range	49900.00	1940.00
Minimum	100.00	50.00
Maximum	50000.00	1990.00
Sum	5945808.51	569730.00
Count	599.00	566.00

The descriptive statistics show very large sample variance for Plastic money vs Mobile. This may be attributed to the user's preference for cash in Indian economy.

Mobile Wallet users show much more consistent approach and much less sample variation and Standard Deviation. Also the mode differs in both cases shows most users spend much less on an average for mobile wallet.

The much more predictable and consistent spend for the mobile wallet users show the preference of users to use wallet in a more predictable and consistent way. Even though the average spend is similar in both categories there is substantial difference in USAGE.

Table 88 Descriptive statistics comparing plastic money and wallet

The descriptive statistics show very large sample variance for Plastic money vs Mobile. This may be attributed to the user's preference for cash in Indian economy. Even though the average spend is similar in both categories there is substantial difference in USAGE.

Row Labels	Car / home/ personal Loan	Improve credit rating	Pay off debt	Saving for future	Grand Total
1 to 3 lakh	18(9%)	24(22%)	41(32%)	101(34%)	184
3 to 5 lakh	5(6%)	16(14%)	18(14%)	34(11%)	73
5 to 10 lakh	10(11%)	12(11%)	18(14%)	46(15%)	86
10 lakhs and above	17(16%)	25(23%)	21(16%)	42(14%)	105
#N/A	22(14%)	30(28%)	28(22%)	70(23%)	151
Grand Total	72(12%)	107(100%)	126(100%)	293(100%)	599

Table 89 Financial goal for various income groups

Table above shows high saving propensity shows in the limited use of cards. This affects most of the parameters across age groups (analysis done earlier) and in this table the similar analysis done for various income categories also highlight the same fact.

24. Technical factors like features that determine use of these instruments.

Next technical factors are analyzed after normalization to check if the growth of mobile wallet are as per the expectation or falling behind cards.

Plastic Money Usage	Code	Frequency	Percent Respondent	Normalizing the usage based on the fact that plastic money has been in use for 6-decade wallet is around for 5 years. Factor 2* 5/60	Normalized Value of Percent of respondent who use the feature Using Plastic Money
Transfer Money	1	313	52%	0.17	9%

Mobile recharge and online Sales	2	331	55%	0.17	9%
Entertainment and Luxury item	3	105	18%	0.17	3%
Mobile recharge and online Sales	4	162	27%	0.17	5%
Entertainment and Luxury item	5	160	27%	0.17	4%
Shopping in stores	6	457	76%	0.17	13%
Banking Transaction and trading	7	163	27%	0.17	5%
Health	8	484	81%	0.17	13%
Other	9	3	1%	0.17	0%
Education	10	152	25%	0.17	4%
Average					6%

Table 90 Technical factor influence on usage of Plastic money

Table above shows that the values are comparable across mobile wallets and plastic money when normalized and most of this has a positive influence mostly in shopping at 13 percent. Similar values are expected for mobile wallets given in table 92

Mobile Wallet Usage	Code	Frequency	Percentage of Respondents	Most of the transaction values post normalization shows that mobile Wallet has a far greater acceptance in user and a higher usage and adoption.
Other	1	64	11%	
Apparel and shopping	2	73	13%	
Book Holiday	3	22	4%	
Electronic	4	49	9%	
Food	5	146	26%	
Loan payment	6	42	7%	
Rent	7	56	10%	
Transport	8	114	20%	
Average			13%	

Table 91 Categories of use and usage of wallet

Table above shows Most of the transaction values post normalization shows that mobile Wallet has a far greater acceptance in user and a higher usage and adoption. The apparel and shopping values match in earlier tables and similar values can be expected for other categories as well. Similarly, loan payments or banking transactions have low percentage frequency in both mobile wallet and plastic money.

25.Demographic factors like age and how it affects the usage and adoption of cards.

Next in line is the demographic factor that is analyzed across mobile wallet and plastic money.

	Mobile wallet usage every week				Plastic money usage every week			
Age	Average	Max	Min	No of respondents	Average	Max	Min	No of respondents
Age: 10 - 20	5.27	8	2	15	1.67	4	0	9
Age: 20 - 30	10.39	20	1	115	2.28	22	0	119
Age: 30 - 40	10.80	20	1	98	2.22	10	0	98
Age: 40 - 50	11.01	20	1	104	1.96	5	0	112
Age: 50 - 60	10.28	20	1	94	2.00	4	0	97
Age: 60 - 70	10.95	20	1	83	1.92	4	0	103
Age: 70 - 80	9.67	20	1	57	1.77	4	0	61
Grand Total	10.43			566	2.04		0	599
Mobile wallet usage frequency is almost five times frequency of usage of Plastic Money.								

Table 92 Age and usage and adoption of cards

Mobile wallet usage frequency is almost five times frequency of usage of Plastic Money.

26.Perceptions factors like security, ease of use, convenience

Plastic money and mobile wallets were analyzed for security and are being compared again for security and convenience in tables given below. This time with a different view.

	Count of Security	Percentage of 599 respondents (Multiple Choice Question)
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Access website link directly	209	35%
Block card when phone is stolen	395	66%
Do not have photocopy of card	110	18%
Memorize CCV number	210	35%
Transaction alerts	348	58%
Transaction password	388	65%
Use Images	136	23%
User virtual card	89	15%
User virtual keyboard	67	11%
Access website link directly	23	4%
Do not have photocopy of card	24	4%
Fix limit on card	189	32%
Memorize CCV number	46	8%
Transaction alerts	45	8%
Use Images	112	19%
User virtual card	23	4%
User virtual keyboard	137	23%

Table 93 Perception factors for cards when it comes to security and how user secure the cards.

Table gives the perception factors for cards when it comes to security and how user secures the cards. Many use credentials to the latest features like virtual cards to secure the payments. Similarly, it is also expecting that mobiles would introduce such challenges in payment and the users would have general concerns around security.

Mobile Wallet faces a peculiar problem in that most of the users are not able to enumerate security feature in wallet. Consequently, users were asked to rate on confidence around security. The table summarizes the findings.

How confident are you that your personal information will not be stolen?		
Rating on a scale of one to five	Count	Percentage

1	116	19.37%
2	109	18.20%
3	115	19.20%
4	111	18.53%
5	115	19.20%
Grand Total	566	

Table 94 Security factor for mobile

Table shows that the users do have concerns around security and are equally spread out through the spectrum. All five points on the rating scale have got similar counts (100 plus) which show that the users have broad range of issues using wallets. Some view security as a serious challenge while there are others who do not. A large number of people fall in the mid category as well but this data is enough to show that a lot needs to be done on security to gain more user confidence and consequently more user base.

27. Education and awareness about the use of these instruments that affect the use.

Education and awareness are mostly linked. The data is analyzed again to find out the influence of education on ease of use of cards and knowledge of credit scores. As in earlier cases the data is looked into from a different perspective.

Plastic Money	How easy is it to get a credit card			Do you know Credit Score	
Education	Very Easy	Easy	Not easy	Yes	No
B.E. /B.Tech	75	56	67	84	114
Graduation	55	52	48	79	75
Master Degree		6		2	4
Others	65	51	55	94	77
Ph. D	27	11	22	26	34
Unanswered	5	2	2	6	3
Inference: Shows education might not change the perception of users and does not encourage them to get their credit scores. Other factors like security and features					

encourage people to use more of electronic transactions.
--

Table 95 Relative ease of use for cards by education

Table above shows education might not change the perception of users and does not encourage them to get their credit scores. Other factors like security and features encourage people to use more of electronic transactions.

	Do you always carry your card					
	Plastic Money			Mobile Wallet		
Education	Yes	Sometimes	Unanswered	Yes	No	Sometimes
B.E. /B.Tech	86		112	98	51	40
Graduation	83	6	65	98	51	40
Master Degree	6			4		2
Others	72		99	96	41	49
Ph. D	21		39	27	13	8

Table 96 Influence of education and carrying cards or wallets

Table above is linked to credit scores which is not-different across plastic money and mobile wallet. What is especially applicable for mobile wallets is whether users carry the wallet with them always. In other words, does the user keep using the cards and wallets. This table 97 shows that education does not change the attitude towards digital transactions much and most of the values have a predictable pattern across plastic money and mobile wallets.

7.3: Summary

Analysis of the same data in various ways reveal finer aspects of the survey and the various interpretation of the data collected in the survey.

Chapter Eight: Final Survey and findings

Chapter Eight: Final Survey and findings

8.1: Overview:

The result of the survey is covered in this chapter and also gives detailed analysis done during this research. The survey was carried out in Bengaluru district as per the research plan and the result of the analysis is documented below.

8.2:Data

As two sets of survey are conducted so separate results are obtained for plastic money and virtual wallet technology. Both these data set are compared for demography, usefulness and other features.

Data Sample Composition

Composition of sample	Final Survey
Virtual wallet	566
Total Credit and debit Cards Surveyed and answered	
No. Of People who had Credit Card in survey	599
No. Of People who had Debit Card in survey	599
Non User	150 respondents

Table 97 Composition of Sample in final Survey

Table nine gives the total number of respondents for the mobile wallet and Plastic Money survey. Each of the categories was adequately represented in the survey for better outcome. Note that this sample is confined to Bengaluru district only.

Variable		Plastic Money		Virtual Wallet	
		n (599)	%	n (566)	%
Age	Age: 10 - 20	9	1.5	15	8.1
	Age: 20 - 30	119	19.87	115	19.20
	Age: 30 - 40	98	16.36	98	16.36
	Age: 40 - 50	112	18.70	104	17.36
	Age: 70 - 80	97	16.19	94	15.69
	Age: 50 - 60	103	17.20	83	13.86
	Age: 60 - 70	61	10.18	57	9.52
Relationship status	Single	355	59.27	319	53.26
	Married	144	24.04	153	25.54
	Others like divorced	100	16.69	94	15.69
Profession	Salaried	330	55.09	292	48.75
	Self Employed	114	19.03	101	16.86
	Not Answered	154	25.71	158	26.38
Educational qualification	Master Degree	6	1.00	6	1.00
	B.E/B.Tech	198	33.06	189	31.55
	Not Answered	171	28.55	186	31.05
	Ph. D	60	10.02	48	8.01
	Graduation	155	25.88	137	22.87
Income	1 to 3 lakh	184	30.72	183	30.55
	3 to 5 lakh	73	12.19	56	9.35
	5 to 10 lakh	2	0.33	2	0.33
	10 lakhs and above	105	17.53	112	18.70
	Not Answered	150	25.04	133	22.20

For All the data Set 30 percent data set/people belongs to rural and rest from urban area

Further details on Rural and Urban is given in 7.3.17: Urban Bias and Rural behavior

Students are considered as non-earning except where students disclosed the earning

Senior and very senior age groups are well represented. An effort was undertaken to understand if large variations are observed in this age groups. It is surprising to note that senior age groups are catching up or at par with many items as many payments and Gas bookings are now done via mobile and apps.

Senior users have made an attempt to learn the technology as it is better than going outside or depending on others for

needs like gas bookings. Mobile or bill and utility payments.

Senior data set result analysis was not matching with the generally accepted facts in society that Seniors do not learn new technology but looking at the contrary results an effort was made to collect more data from seniors.

Table 98 Demographic profile of the sample

8.3: Average Values for Key Parameters for Plastic money and virtual wallet user

Five key parameters were tested during d final survey about this age gender occupation status and Employment are the key factors that were analyzed. It is also analyzed that most of these parameters have other influencing factors as well but for the sake of convenience these demographic factors were used for first setup analysis. Someone else that was carried out subsequently is based on these data set that is connected from Bengaluru.

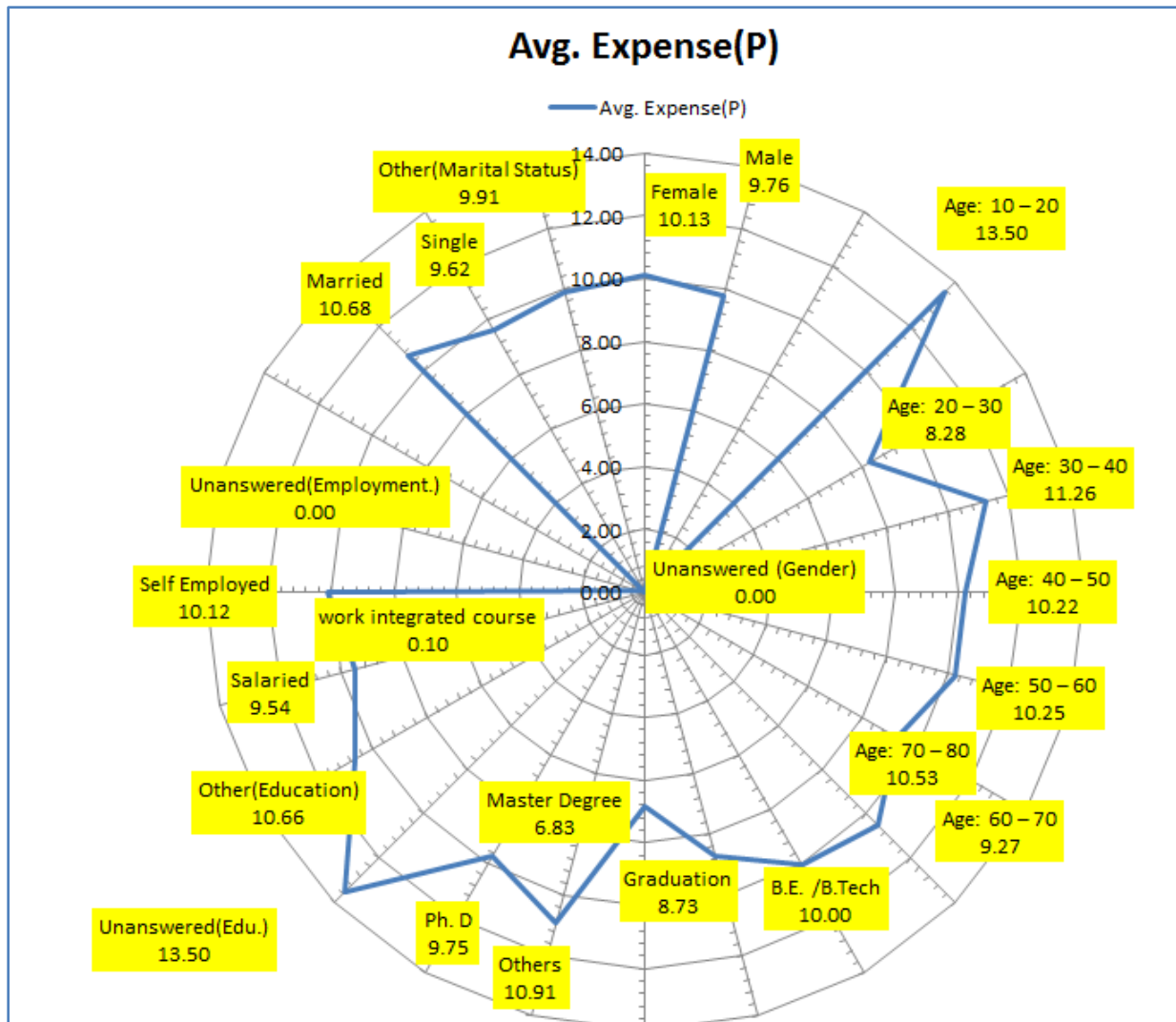


Table 99 Average Expense in thousand for Plastic money

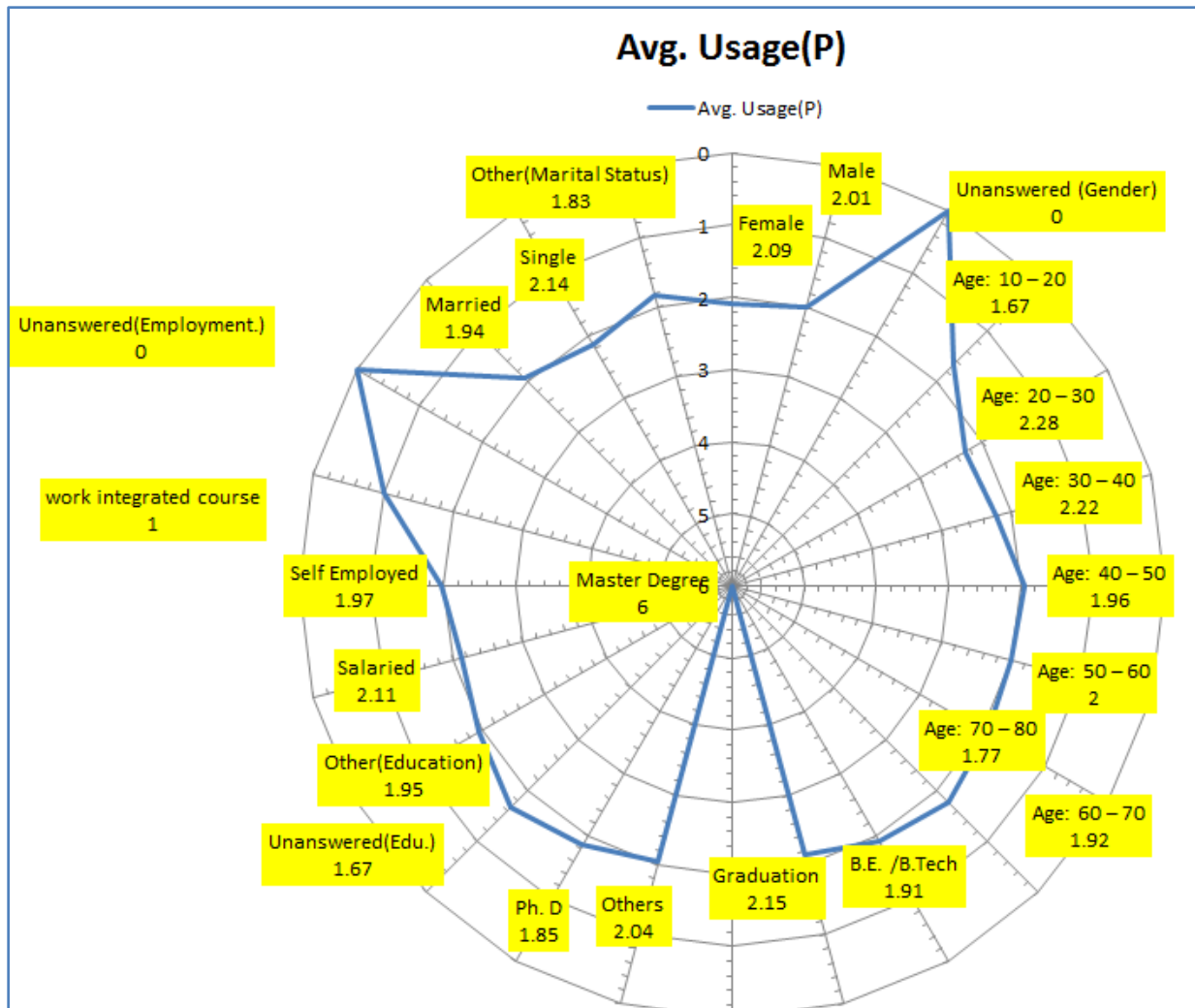


Table 100 Average Usage for Plastic money

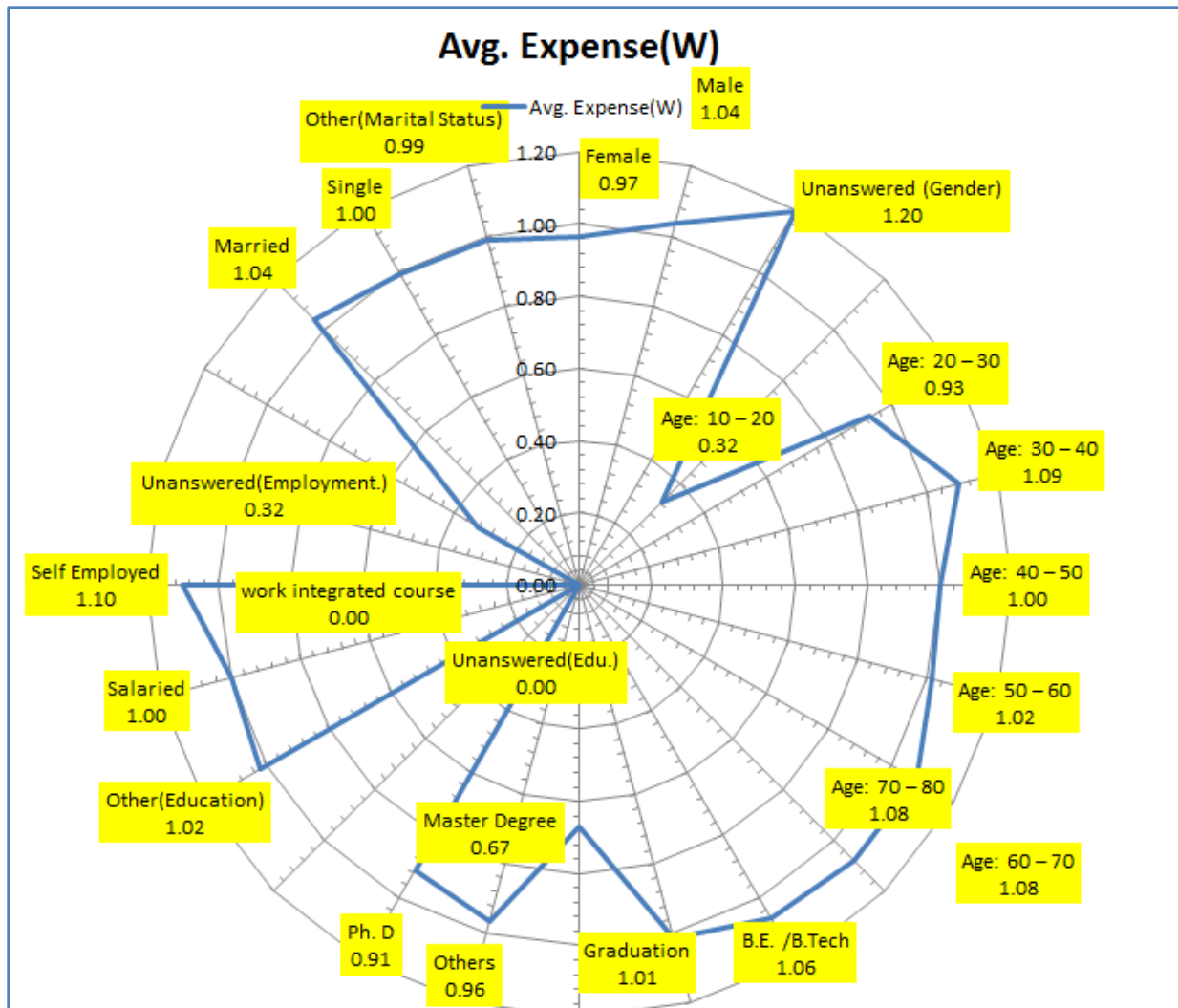


Table 101 Average Expense Virtual Wallet

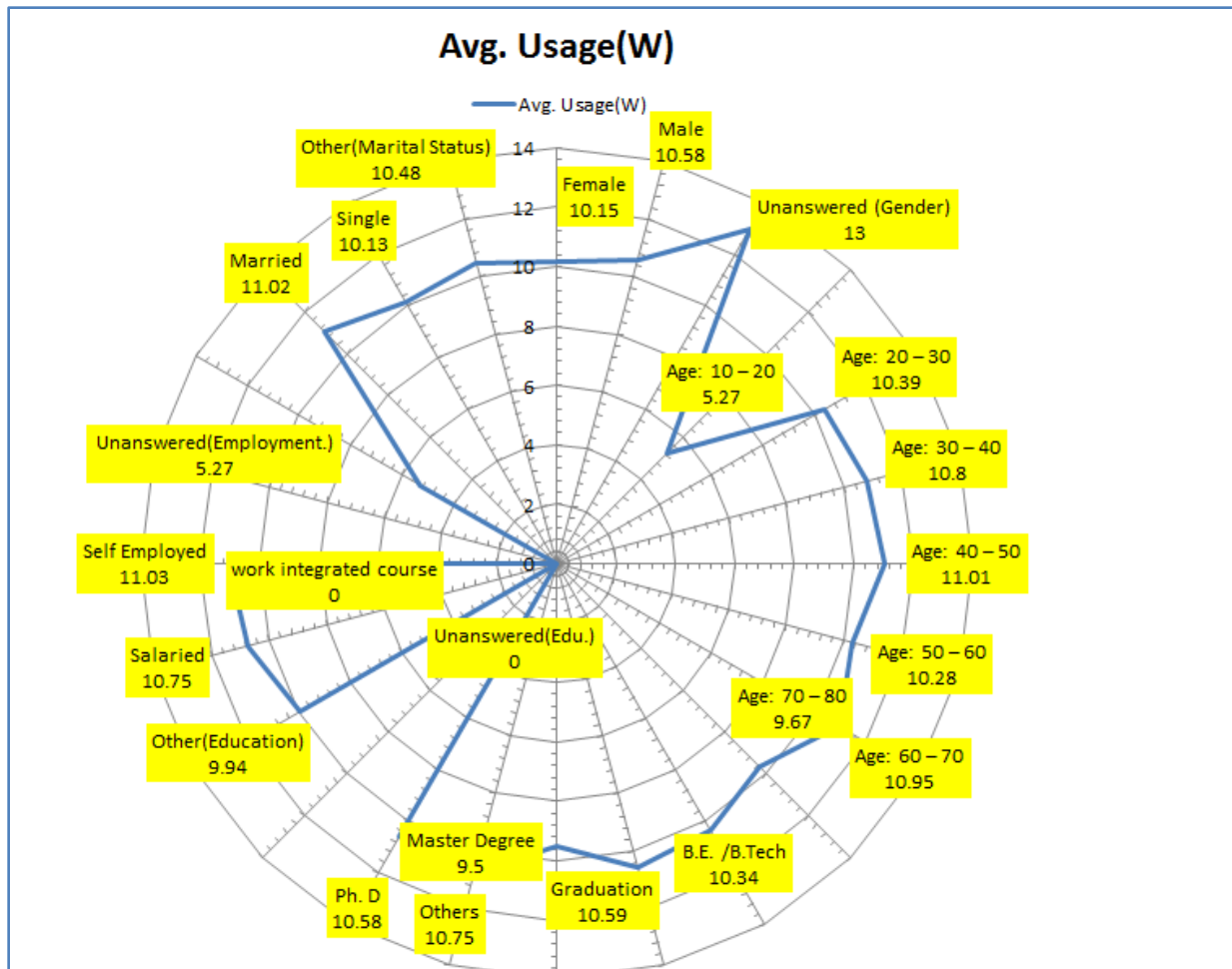


Table 102 Average Usage Virtual Wallet

8.3.1: Chi Square test for key parameters

Chi square test is carried out in the final survey to test out the five demographic variables and the significance of the five demographic variables the significance can be gone with the critical value. All the five factors were tested forever to get pencil average usage frequency across two categories namely plastic money and virtual wallet. The result is summarized below. Father analysis all these p value to test the hypothesis that that was part of the survey. The results of the failure the analysis is also compared with the pilot survey that out on a small sample of individuals.

	Plastic money						Virtual Wallet					
Variable	Expense Significance	p-value	Usage Significance	p-value	Awareness about features	p-value	Expense Significance	p-value	Usage Significance	p-value	Awareness about features	p-value
Gender	No	0.75	No	0.40	No	0.51	Yes	0.00	No	0.72	No	0.46
Age	No	0.30	No	0.89	No	0.90	No	0.54	No	0.15	Yes	0.01
Education	Yes	0.00	Yes	0.00	No	0.06	No	0.48	No	0.78	Yes	0.00
Profession	Yes	0.00	No	0.98	Yes	0.00	No	0.87	Yes	0.02	Yes	0.0
Marital_Status	No	0.43	No	0.38	No	0.16	No	0.13	No	0.82	No	0.4
P-Critical	0.05											

Table 103 Chi Square test for Significance and P-Value observed in Final Survey (Null hypothesis accepted yes or no)

8.3.2: Association between Plastic Money and Variables Identified in Objective One

Category: Plastic Money		
Significance Level 0.05		
To assess the level of usage, spend and awareness about features among the users		
Hypothesis Statement	P-Value	Interpret results
Variables: Gender		

Hypothesis HP10: Plastic Money use is not influenced by gender.	0.75	Accept
Hypothesis HP1a: Plastic Money use is influenced by gender.		Reject
Hypothesis HP2-0: Spends of Plastic Money is not influenced by gender.	0.4	Accept
Hypothesis HP2a: Spends of Plastic Money is influenced by gender.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by gender.	0.51	Accept
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by gender.		Reject
Variables: Age		
Hypothesis HP70: Plastic Money use is not influenced by age	0.3	Accept
Hypothesis HP7a: Plastic Money use is influenced by age		Reject
Hypothesis HP80: There is no association between age and Spends of card.	0.89	Accept
Hypothesis HP8a: There is association between age and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by age.	0.9	Accept
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by age.		Reject
Variables: Education		
Hypothesis HP30: There <u>is no association</u> between education and high usage of card.	0	Reject
Hypothesis HP3a: There <u>is association</u> between education and high usage of card.		Accept
Hypothesis HP40: There is no association between education and Spends of card.	0	Reject
Hypothesis HP4a: There is association between education and Spends of card.		Accept
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by education.	0.06	Reject

Hypothesis HP1a: Awareness about features of Plastic Money is influenced by education.		Accept
Variables: Profession		
Hypothesis HP50: Plastic Money use is not influenced by occupation.	0	Reject
Hypothesis HP5a: Plastic Money use is influenced by occupation		Accept
Hypothesis HP60: There is no association between occupation and Spends of card.	0.98	Accept
Hypothesis HP6a: There is association between occupation and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by occupation.	0	Reject
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by occupation.		Accept
Variables: Marital Status		
Hypothesis HP90: Plastic Money use is not influenced by marital status	0.43	Accept
Hypothesis HP9a: High plastic moneys use is influenced by marital status		Reject
Hypothesis HP100: There is no association between marital status and Spends of card.	0.38	Accept
Hypothesis HP10a: There is association between marital status and Spends of card.		Reject
Hypothesis HP10: Awareness about features of Plastic Money is not influenced by Marital Status	0.16	Accept
Hypothesis HP1a: Awareness about features of Plastic Money is influenced by Marital Status.		Reject

Table 104 Objective One Hypothesis Testing for Final Survey on Plastic Money

Sample to show how the value was interpreted
<p>Hypothesis HP6₀: There <u>is no association</u> between occupation and Spends of card.</p> <p>Hypothesis HP6_a: There <u>is association</u> between occupation and Spends of card.</p>

Interpret results: Since the P-value (0.98) is more than the significance level (0.05), we do accept the null hypothesis. Thus, we conclude that there is relationship between Profession and plastic money average spends.
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Table 105 Sample to show how the value was interpreted

Reliability Coefficients	>7	for various groups
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8.3.3: Association between Plastic Money and Variables Identified in Objective Two

Plastic Money		
Level 0.05		
To analyze the perception and preference of user's transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.		
Hypothesis Statement	P-Value	Interpret results
Variables: Preference		
Hypothesis HP11 ₀ : Banking Customers <u>do not prefer</u> Plastic Money to Physical Visit to Bank Branches	0.56	Accept
Hypothesis HP11 _a : Banking Customers <u>prefer</u> Plastic Money to Physical Visit to Bank Branches		Reject

Table 106 Objective Two Hypothesis Testing for Final Survey on Plastic Money

Reliability Coefficients	>7	for various groups
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8.3.4: Association between Plastic Money and Variables Identified in Objective Three

Plastic Money		
Level 0.05		
To identify, on the basis of analysis of perception, the factors that impact growth and use of plastic money and virtual wallet		
Hypothesis Statement	P-Value	Interpret results
Variables: Security		
Hypothesis HP12 ₀ : Level of Security is not responsible for customers not opting for Plastic Money	0.06	Accept
Hypothesis HP12 _a : Level of Security is responsible for customers not opting for Plastic Money		Reject
Variables: Education		
Hypothesis HP13 ₀ : Amount of Surcharge does not influence customers not opting for Plastic Money	0.53	Accept
Hypothesis HP13 _a : Amount of Surcharge influences customers not opting for Plastic Money		Reject
Variables: Support		
Hypothesis HP14 ₀ : Support of Banks does not influence customers not opting for Plastic Money	0.88	Accept
Hypothesis HP14 _a : Support of Banks influences customers not opting for Plastic Money		Reject

Table 107 Objective Three Hypothesis Testing for Final Survey on Plastic Money

Reliability Coefficients	>7	for various groups
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8.3.5: Association between Virtual Wallet and Variables Identified in Objective One

Category: Virtual Wallet		
Significance Level 0.05		
To assess the level of usage, spend and awareness about features among the users		
Hypothesis Statement	P-Value	Interpret results
Variables: Gender		
Hypothesis HW1 ₀ : Gender <u>has no influence</u> on how many times virtual wallet is used.	0	Reject
Hypothesis HW1 _a : Gender <u>has influence</u> on how many times virtual wallet is used.		Accept
Hypothesis HW2-0: Spends of virtual wallet are not influenced by gender.	0.72	Accept
Hypothesis HW2 _a : Spends of virtual wallet is influenced by gender.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by gender.	0.46	Accept
Hypothesis HW1 _a : Awareness about features of virtual wallet is influenced by gender.		Reject
Variables: Age		
Hypothesis HW7 ₀ : Age <u>has no influence</u> on how many times virtual wallet is used.	0.54	Accept
Hypothesis HW7 _a : Age <u>has influence</u> on how many times virtual wallet is used.		Reject
Hypothesis HW8-0: Spends of virtual wallet are not influenced by age.	0.15	Accept
Hypothesis HW8 _a : Spends of virtual wallet is influenced by age.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by age.	0.01	Reject
Hypothesis HW1 _a : Awareness about features of virtual wallet is influenced by age.		Accept
Variables: Education		
Hypothesis HW3 ₀ : Education has <u>no influence</u> on the preference for particular type of wallet.	0.48	Accept

Hypothesis HW3a: Education <u>has influence</u> on the preference for particular type of wallet.		Reject
Hypothesis HW4-0: Spends of virtual wallet are not influenced by education.	0.78	Accept
Hypothesis HW4a: Spends of virtual wallet is influenced by education.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by education.	0	Reject
Hypothesis HW1a: Awareness about features of virtual wallet is influenced by education.		Accept
Variables: Profession		
Hypothesis HW5 ₀ : Occupation <u>has no influence</u> on how many times virtual wallet is used.	0.87	Accept
Hypothesis HW5a: Occupation <u>has influence</u> on the preference for particular type of wallet.		Reject
Hypothesis HW6-0: Spends of virtual wallet are not influenced by occupation.	0.02	Reject
Hypothesis HW6a: Spends of virtual wallet is influenced by occupation.		Accept
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by occupation.	0	Reject
Hypothesis HW1a: Awareness about features of virtual wallet is influenced by occupation.		Accept
Variables: Marital Status		
Hypothesis HW9 ₀ : Marital Status <u>has no influence</u> on how many times virtual wallet is used.	0.13	Accept
Hypothesis HW9 _a : Marital Status <u>has influence</u> on how many times virtual wallet is used.		Reject
Hypothesis HW10-0: Spends of virtual wallet are not influenced by Marital Status.	0.82	Accept
Hypothesis HW10a: Spends of virtual wallet is influenced by Marital Status.		Reject
Hypothesis HW1 ₀ : Awareness about features of Plastic Money is not influenced by Marital Status	0.4	Accept
Hypothesis HW1a: Awareness about features of virtual wallet is influenced by Marital Status.		Reject

Table 108 Objective One Hypothesis Testing for Final Survey on Virtual Wallet

Reliability Coefficients	>7	for various groups
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8.3.6: Association between Virtual Wallet and Variables Identified in Objective Two

Virtual Wallet		
Level 0.05		
To analyze the perception and preference of user's transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.		
Hypothesis Statement	P-Value	Interpret results
Variables: Preference		
Hypothesis HW110: Banking Customers do not prefer Virtual Wallet to Physical Visit to Bank Branches	0.43	Accept
Hypothesis HW11a: Banking Customers prefer Virtual Wallet to Physical Visit to Bank Branches		Reject

Table 109 Objective Two Hypothesis Testing for Final Survey on Virtual Wallet

Reliability Coefficients	>7	for various groups
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8.3.7: Association between Virtual Wallet and Variables Identified in Objective Three

Virtual Wallet		
Level 0.05		
To identify, on the basis of analysis of perception, the factors that impact growth and use of plastic money and virtual wallet		
Hypothesis Statement	P-Value	Interpret results
Variables: Security		
Hypothesis HW120: Level of Security is not responsible for customers not opting for virtual Wallet	0.28	Accept
Hypothesis HW12a: Level of Security is responsible for customers not opting for virtual wallet		Reject
Variables: Education		

Plastic Money and Virtual Wallet		
Economic factors like Growth and Saving.		
To assess the Factors		
P= Plastic Money		

Hypothesis HW13 ₀ : Amount of Surcharge does not influence customers not opting for Virtual Wallet	0.83	Accept
Hypothesis HW13 _a : Amount of Surcharge influences customers not opting for virtual wallet		Reject
Variables: Support		
Hypothesis HW14 ₀ : Support of Banks does not influence customers not opting for virtual wallet	0.21	Accept
Hypothesis HW14 _a : Support of Banks influences customers not opting for virtual wallet		Reject

Table 110 Objective Three Hypothesis Testing for Final Survey on Virtual Wallet

Reliability Coefficients	>7	for various groups
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8.3.8: Economic factors like Growth and Savings

W= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Reasons for patronizing and using the same card or wallet	Good for online transaction	33	Wallet technology is new: data not relevant	Indian respondents use the card for online transaction.
	Always used this bank	28		
	Good Service	19		
	Good rewards	19		
	Have poor credit rating, so cannot go elsewhere	0		
	It is linked with my loan	0		
	Creating new account is not easy	0		
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Usage of cards	Transfer Money or Loan Payment	52	7	Most of the respondents have used the card for medical bill payments and followed by shopping. This may be indicating higher health care cost and need for immediate payment in hospitals.
	Mobile recharge and online Sales	55	9	
	Entertainment and Luxury item	18		
	Shopping in stores	76	13	
	Banking Transaction and trading	27		
	Health	81		
	Education	25		
	Book Holiday	Major category selected as per pilot survey	4	
	Food		26	
	Rent		10	
	Electronic		9	
	Transport		20	
	Others	1	11	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Annual Fees & Other charges good value for money?	Fees Acceptable	19	Emergence of Payment Banks via Mobile is	Most of the respondents think that the charges on the cards are

	Value for money	13	reshaping wallets so this data is not relevant.	undesirable and high. There is also Scope to offer interest in wallet like the new payment banks.
	Very high charges and fees	25		
	Very Undesirable	41		
	Loss of Interest		100	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Make international money transfer	Yes	34	0	Most of the respondents have not used the cards outside the country and credit cards are used during foreign travels. Wallets using Cryptocurrency would be game changers
	No	65	0	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Factors users look at before you apply for Card or Wallet	Interest rate charged	19		Listing top three factors.
	Annual Fees & Other charges	13		
	Rewards and Offers on Card	25		
	Customer Service and Transparency	25		
	Convenience to pay the bills	41		
	Ease of use		10	Ease of use and Simplicity are easily identified features and rest of data not relevant for wallets.
	Simplicity		50	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
What is your financial goal this year?	Saving for future	48	48	Saving for Future is Number one priority. This category does not change for Plastic
	Pay off debt	21	21	
	Improve credit rating	17	17	

Plastic Money and Virtual Wallet				
Technical factors and features that determine use of these instruments.				
To assess the Factors				
P= Plastic Money				
W= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Result (P)	Result (W)	Interpret results
How do you rate the following parameters while applying for credit and debit cards Buy more when you get discount coupons!	Easy payment method	2.45	3.12	Safety, Fuel Surcharge waver and wide support by various vendors are the key features that users
	Safety is paramount	2.69	3.5	
	Rewards	2.63	2.89	
	Yes	52	50	discount works better with card users

Table 111 Economic factors like Growth and Savings

Reliability Coefficients	>7	for various groups
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8.3.9: Technical factors covering direct and indirect influencers

	Simplicity of use	2.62	2.95	are looking for in plastic money. Though the users are almost looking for maximum number of features and none of the feature is very far from the average.
	Fuel surcharge waver	2.64	2.64	
	EMI option	2.52		
	Supported by most vendors	2.66		
	Great offers	2.47		
	Card replaced before expiry	2.57		
	Open Wallets		3.14	
	Accessible from laptop and mobile		3.16	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Why do people use the same bank?	Good for online transaction	32	Not covered due to emergence of mobile payment banks which are changing dynamics.	Good online transactions, Long association with bank, good service are the top three reasons why the respondents keep using the same bank.
	Always used this bank	27		
	Good Service	20		
	Good rewards	19		
	Creating new account is not easy	3		
	Have poor credit rating, so cannot go elsewhere	0		
	It is linked with my loan	0		

Table 112 Technical factors covering direct and indirect influencers

Reliability Coefficients	>7	for various groups
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8.3.10: Demographic Factors

Plastic Money and Virtual Wallet		
Demographic factors like age and how it affects the usage and adoption of cards.		
To assess the Factors		
P= Plastic Money		

W= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness and Adoption	.10 - 20	55	60	Likert Scale used shows level of awareness and adoption probability based on result
	20 - 30	48	47	
	30 - 40	45	46	
	40 - 50	43	50	
	50 - 60	48	54	
	60 - 70	46	45	
	70 - 80	46	43	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness and Adoption	Male	32	32	Likert Scale used shows level of awareness and adoption probability based on result
	Female	27	21	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness and Adoption	Married	55	48	Likert Scale used shows level of awareness and adoption probability based on result
	Single	48	47	
	Others	45	51	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness and Adoption	Salaries	47	48	Likert Scale used shows level of awareness and adoption probability based on result
	Self Employed	51	50	
	Others	42	56	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness and Adoption	<3 lakhs	58	50	Likert Scale used shows level of awareness and adoption probability based on result
	Up to 5 lakhs	36	44	
	Above 5 lakhs	51	48	

Plastic Money and Virtual Wallet		
Perceptions factors like security, ease of use and convenience		
To assess the Factors		
P= Plastic Money		

Table 113 Demographic Factors

Reliability Coefficients	>7	for various groups
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8.3.11: Perceptions factors like security, ease of use and convenience

W= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Buying preference card and wallet	Food	62	80	Safety, Fuel Surcharge waver and wide support by various vendors are the key features that users are looking for in plastic money. Though the users are almost looking for maximum number of features and none of the feature is very far from the average.
	Transport	46	60	
	Apparel and shopping	47	40	
	Rent	47	40	
	Loan Payment	51	40	
	Electronics	45	0	
	Book Holiday	50	0	
	Others	48	40	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Average level of Satisfaction of users on a count of 1 to5 with 5 being the highest	Debit card respondent	3.2	Not covered due to emergence of mobile payment banks which are changing dynamics.	Most of the users use both debit and credit cards and respondents are satisfied using the debit card over the credit card.
	Credit card respondent	3.8		
	Debit and credit card respondent	3.02		
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Count of Do you always carry your debit or credit with you?	Yes	45	45	Most of the users carry cards with them. .
	Sometimes	1	1	
	Others, I like cash	53	53	
Analysis	Criteria	Result (P)	Result (W)	Interpret results
What do you do to secure your card?	Block card when phone is stolen	15	Wallet employs different Security measure	Top Three Choices for cards.
	Set Transaction alerts	15		

Plastic Money and Virtual Wallet				
Education and awareness about the use of these instruments that affect the use.				
To assess the Factors				
P= Plastic Money				
W= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness factors to look at before you apply for card or wallet	>3 Factors	9	Users do not recall multiple factors for wallet	There is high level of awareness about the various factors for card but negligible for wallets.
		8		
		47		
		29		
		4		
	<=3Factors	30		
	<2Factors			
	Ease of use		10	Ease of use and Simplicity are easily identified features and rest of data not relevant
	Simplicity		60	

Table 114 Perceptions factors like security, ease of use and convenience

Reliability Coefficients	>7	for various groups
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8.3.12: Education and Awareness Factors

				for wallets.
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness of credit score	Yes	48	Does not affect credit score but likely to change.	There is high level of awareness about the various factors.
	No	52		
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Awareness about benefits of using the cards	>3 Factors	24	0	There is high level of awareness about the various factors.
	<=3Factors	21	0	Virtual Wallet Benefits Listed by users:
				1.Alerts like coupons and alerts
				2.Compare and shop
				3.Entertainment and Luxury item
				4.Generate electronic receipts
				5.Get Location based offer
				6.Purchase
	<2Factors	55	90	7.Store loyalty card
Analysis	Criteria	Result (P)	Result (W)	Interpret results
Who uses your card and wallet	Parents	20	Wallet technology new so data not relevant	Users do share the card with others.
	Spouse	20		
	Not Answered	60		

Table 115 Education and Awareness Factors

Reliability Coefficients	>7	for various groups
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8.3.13: Correlation

	How many times do you use credit or debit card in a week?	Educational qualification	Relationship status? (optional)	Profession	Gender
How many times do you use credit or debit card in a week?	1				
Educational qualification	-0.01614	1			
Relationship status?	-0.07614	0.007552	1		
Profession	-0.04111	0.037099	0.037837	1	
Gender	0.023803	0.061335	-0.03555	-0.03244	1

Table 116 Correlation table

Table above shows that there is no significant LINEAR RELATION between variables and in other words the change in one variable is unlikely to influence any other variables significantly. Both strength and direction of the variables need not be taken into consideration for further analysis.

8.3.14: Principal Component Analysis

Heat map

Rows are centered; unit variance scaling is applied to rows. Imputation is used for missing value estimation. Both rows and columns are clustered using correlation distance and

average linkage. 13 rows, 599 columns.



Figure 32 Principal Component Analysis Heat Map

Unit variance scaling is applied to rows; SVD with imputation is used to calculate principal components. X and Y axis show principal component 1 and principal component 2 that explain 37.4% and 14.9% of the total variance, respectively. N = 599 data points.

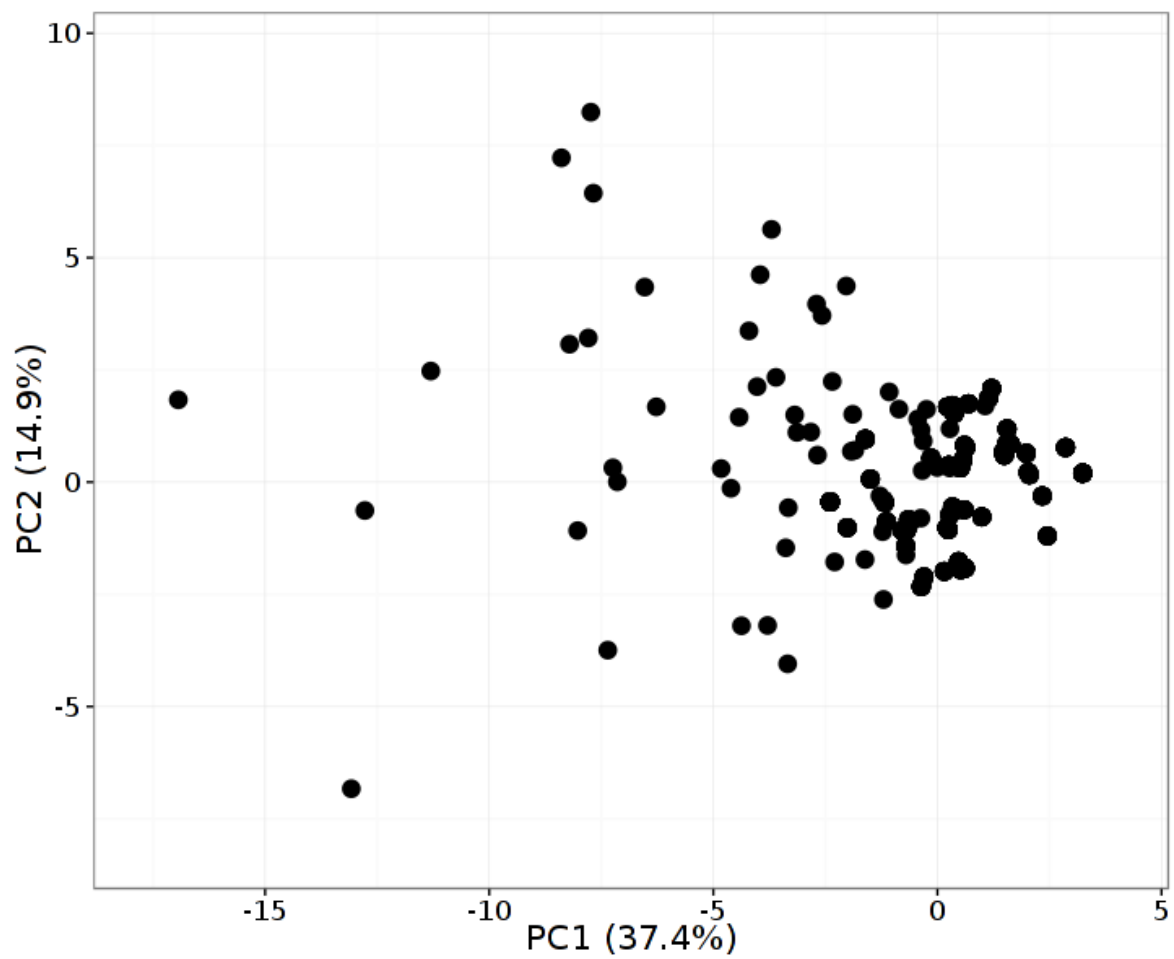


Figure 33 Principal Component Analysis values for top two factors

Reliability Coefficients	>7	for various groups
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8.3.15: Technology Acceptance Model

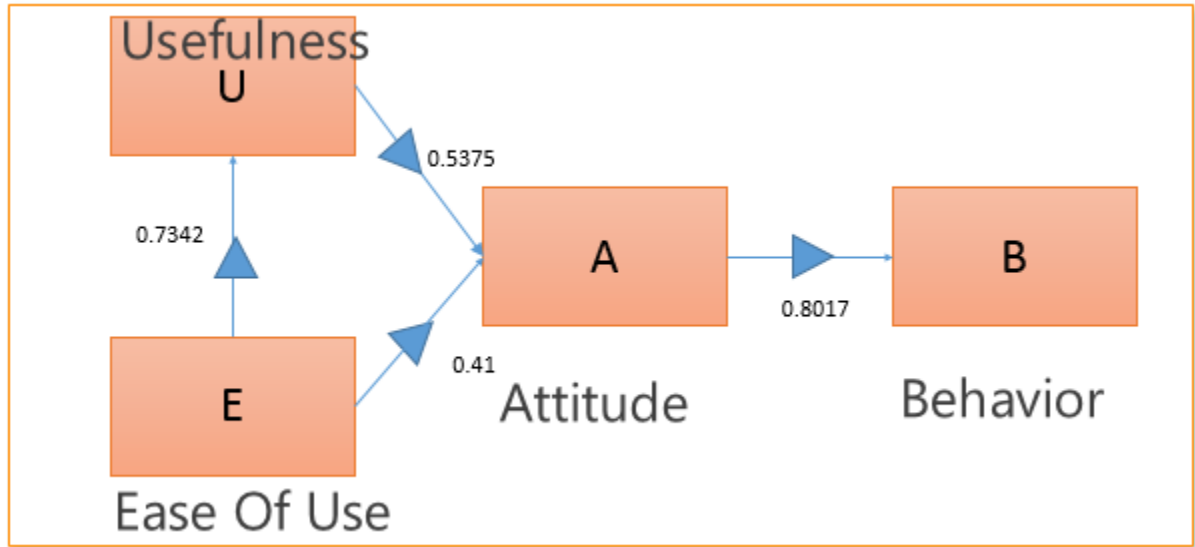


Figure 34 Technology Acceptance Model results

Category:	Virtual Wallet		
Significance	Level 0.05		
Objective:	Analyze Technology Acceptance Model		
Variables:	Hypothesis Statement	Path Value	Interpret results
E->U	Hypothesis HT₁₀: A user's perceived ease of use of mobile payment services has a positive effect upon his perceived usefulness to use mobile payment services.	0.73	Accept
E->A	Hypothesis HT₂₀: A user's perceived ease of use of mobile payment services has a positive effect upon his attitude to use mobile payment services.	0.41	Accept
U->A	Hypothesis HT₃₀: A user's perceived usefulness of mobile payment services has a positive effect upon his attitude to use mobile payment services.	0.54	Accept
A->B	Hypothesis HT₄₀: A user 'attitude towards mobile payment services has a positive effect upon his to use mobile payment services.	0.8	Accept

Hypothesis	Path	Path Detail	Path coefficient	Results
HT1	E -> U	Perceived Ease of Use -> Perceived Usefulness	0.7342	accepted
HT2	E -> A	Perceived Ease of Use -> Attitude	0.41	accepted
HT3	U -> A	Perceived Usefulness -> Attitude	0.5375	accepted
HT4	A -> B	Attitude-> Behavior Intention to Use	0.8017	accepted

Figure 35 Path Coefficient and Results

8.3.16: Reason for not having a card (Non users)

Category: Non Users		
Action	Reason for not having cards (150 respondents)	
No	Reason	Percentage
1	Very young / Not earning	6
2	Not requires as uses family member's cards or cash	12
3	Do not have document for KYC/ID	16
4	Low income	5
5	Peace of mind and no need to maintain credit score or charges on cards	18
6	Financing purchases can lead to bad spending or over spending	9
7	Others/ Unanswered	34

Plastic Money and Virtual Wallet			
Urban Bias and Rural Behavior			
To access the difference in mean for urban and rural along with key indicators			
U= Urban			
R= Rural			
P= Plastic			

8.3.17: Urban Bias and Rural behavior

Further analysis was carried out by separating the urban and rural population to ascertain if there is a significant difference in the way urban and rural population would use credit and debit cards. A comparison of various factors was carried out for Bengaluru Urban and Rural Areas. To get a complete view some of the areas at fringes of the Bengaluru district was included in Rural areas though these may not be distinctly marked as rural but matches with other Rural areas in Bengaluru district. The summary of the analysis is given below.

Money				
V= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Urban	Rural	Info
Urban and Rural				According to the 2001 census, the total population of the district was, 1,881,514 of which 21.65% were urban. Source is wiki
	Percentage	21.65	78.35	
Urban and Rural	Percentage	22.65	77.35	
Economic factors like Growth and Saving	Percentage Difference in group mean from survey mean	-5	5	Up to five percentage difference/variance from combined sample mean is seen in the survey of Urban and rural population for Plastic Money
Technical factors that determine use of these instruments		-3	3	
Demographic factors like age and how it affects the usage and adoption of cards.		-5	5	
Perceptions factors like security, ease of use, convenience		-4	4	
Education and awareness about the use of these instruments that affect use		-5	5	
Economic factors like Growth and Saving	Percentage Difference in group mean from survey mean	-9	9	Up to nine percentage difference/variance from combined sample mean is seen in the survey of Urban and rural
Technical factors that determine use of these		-7	7	

instruments			population for Virtual Wallet
Demographic factors like age and how it affects the usage and adoption of cards.	-3	3	
Perceptions factors like security, ease of use, convenience	-4	4	
Education and awareness about the use of these instruments that affect use	-5	5	

How to interpret the table: Negative or positive five percent for urban or rural shows that the urban population is behaving slightly differently to given indicators from the mean values (calculated after combining both rural and urban data). Thus one group is more likely to be influenced by the factor than the other.

8.4 Findings

Awareness, cost, demography, features, perception, preference, security, suggestion and usage have to be analyzed in depth. Important findings are.

Objective 1. To assess the level of usage, spend and awareness about features among the users pertaining to plastic money and virtual wallet
Usage
On average people use the card 2 times every week for debit and credit cards.
Five of Six people including both male and female used one card only.
Respondents have used the card for medical bill payments and followed by shopping.
Around 40 percent of users shared the card with someone like parents, spouse Etc

Transfer Money, Mobile recharge and Banking transactions are top three uses of Mobile wallet as stated by respondents.
Average money spent per week on mobile wallet and cards differ significantly.
There is much more predictable and consistent spend for the mobile wallet users
Spend
The average spend is mobile around Rs.1000 (currently).
Transaction values shows that mobile Wallet has a far greater acceptance in user and a higher usage and adoption within a short span of last 5 years.
Awareness
Above fifty percent people not fully aware of the benefits/features of card
Awareness on virtual wallet is similar between married and single people. Self-employed people have high level of awareness as compared to salary people.
Awareness of virtual wallet features is high amount low income user.
Objective 2. To analyze the perception and preference of user's transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.
Preference
While there is a preference for cards people show slightly high preference for credit card at 34 percent over all other cards, number of people who has both credit and debit card is 33 percent as well as only Debit card seems to be significant at 33 percentages.
Respondents have been using the card for 5 or more years on an average showing high loyalty with cards.
People have a similar usage patterns for virtual wallet and plastic money.
Respondents to use the same card and retain the bank accounts they have.
Saving for future is one of the primary financial goal for respondents.
People buy more when they get discount coupons.
There is equally likely chance of using the mobile wallet with or without discount coupons.
Education does not seem to have changed the preference for virtual wallet.
Perception
Users using both debit and credit cards and are likely to be less satisfied than when using either debit card or credit card.
Card generally not used for loan payments
Low concern over credit rating.
Online transactions, Long association with bank, service are the top three reasons why the respondents keep using the same bank.

Objective 3. To identify, on the basis of analysis of perception, the factors that impact growth and use of plastic money and virtual wallet
Safety
Low safety awareness.
Need more safety features.
Fifty percent chance of always carrying card and high chance of carrying one card.
People who are worried of security do not carry the card. Young and a section of mid age people are more confident in carrying.
Users have shared the card(s) with relatives.
Charges / Surcharge
Undesirable and High. For both debit and credit cards more than two third of the respondents think that the charges on the cards are undesirable and high.
The spending habits of the set of users using wallet and plastic money does not show huge variation with the increase in salary.
As seen 54 percent males and 45 percent of female respondents feel they are stuck with the bank.
Support
Equal likely chances of user being neither very satisfied nor very sad with the cards.
For mobile wallet accessibility, open wallet and ease of payment seems to have the greatest influencing factors and would help in mobile adoption rates.
Mobile Wallet reload facility satisfaction is divided almost equally.

8.5: Summary

Suggestion pertaining to creation of awareness, education of customer and strengthen security have to be analyzed. Awareness, cost, demography, features, perception, preference, security, suggestion and usage have to be analyzed in depth. Various categories and their analysis detail are given in this chapter. Awareness about the benefit and the use of card and the general awareness level so that most people are not fully aware benefits of card. On various parameters like safety, surcharge, extensive support by Banks is required in plastic money. The awareness level for various financial instruments seems to be high at low age below 30 across various

demographic factors for plastic money. Most of the people use plastic money for loan payment, electronics, booking holiday Etc. for use very for debit and credit cards. Most people show high preference for credit card, number of people who has both card as well as only Debit card seems to be significant. Most people use the card 2 to 7 times every week. The average spend is mobile around Rs1000 and increasing at a good rate every year. 50% of the respondents have used the credit card to withdraw money. Most people do not always carry card and sometimes carry one card. Most of the respondents have been using the card for 5 or more years.

Including both male and female used 1 card. No significant correlation in between detail of demographic factors.

For mobile wallet accessibility, open wallet and ease of payment seems to have the greatest influence. People have a tendency to use wallet when they are teenagers and frequency of choosing mobile wallet decreased after sixty years and lowered after age 70 significantly. Awareness is similar between married and single people. Self-employed people have high level of awareness as compared to salary people. Awareness is high amount low income user. Education does not seem to have changed the preference for mobile wallet. Gender seems to have influence on the number of mobile wallet used by people. Age has influence on particular type of wallet. Most of the users use both debit and credit cards and respondents are satisfied using the debit card over the credit card. Most of the Indian respondents use the card for transaction and service and do not show lot of concern over credit rating nor use the card extensively for loan payments.

Most of the respondents have used the card for medical bill payments and followed by shopping. This may be indicating higher health care cost and need for immediate payment in hospitals. Most of the respondents think that the charges on the cards are undesirable and high. Most of the users carry cards with them but from the previous analysis it was clear that users carry cards sometimes but not always. Most of the respondents have not used the cards outside the country and credit cards are used during foreign travels. Respondents have a tendency to use the card and retain

the bank accounts they have and have used the credit cards to withdraw money. The average expenditure was higher for people who had both credit and debit cards.

Most of the respondents said they are neither very satisfied nor very sad with the cards which reflect that there is scope for further improvement. Males are satisfied with the cards as compared to females in teen and early ages while women are much more content at the 40 to 50 age group. This can be correlated with the spending habits of both the groups. Around 40 percent of users shared the card with someone like parents, spouse and others which would mean that the spending patterns would not be clearly evident by age groups or gender. Good online transactions, Long association with bank, good service are the top three reasons why the respondents keep using the same bank.

Saving for future is one of the primary financial goal for respondents. 54 percent males and 45 percent of female respondents feel they are stuck with the bank. Loan Payment and Booking holidays are the top two reasons for using debit and credit card. People buy more when they get discount coupons. People who are worried of security do not carry the card. Young and a section of mid age people are more confident in carrying.

In Mobile Wallet reloading facility roughly Equal numbers of people are divided in opinion and so it may be the lack of education that people have difficulty in buying and loading mobile wallet. Mobile users make No direct or indirect international purchase with mobile wallet. This feature is required in mobile wallet. There is equally likely chance of using the mobile wallet with or without discount coupons. Transfer Money, Mobile recharge and Banking transactions are top three uses of Mobile wallet as stated by respondents. So relationship status does not determine the perception of user towards security when it comes to mobile wallet.

The spending of the set of users using wallet and plastic money does not show huge variation with the increase in salary. This indicates the lifestyle and ways of spending, particularly the huge preference for cash over other ways like mobile and Plastic money. The descriptive statistics show very large sample variance for Plastic

money vs virtual wallet which may be attributed to the user's preference for cash in Indian economy.

Average money spent per week on mobile wallet and cards differ significantly. The much more predictable and consistent spend for the mobile wallet users show the preference of users to use wallet in a more predictable and consistent way. Even though the average spend is similar in both categories there is substantial difference in USAGE. Most of the transaction values post normalization shows that mobile Wallet has a far greater acceptance in user and a higher usage and adoption.

Chapter Nine: Policy and Suggestions

Chapter Nine: Policy and Suggestions

9.1: Overview

After extraction of the factors from the survey, awareness, cost, demography, feature, perception preference, security, suggestions and usage the factors are analyzed. Each of these factors is analyzed in multiple ways to arrive at suggestions that would help device suggestion for creating awareness among the entire model banking gadgets. We should also educate the customers the update security buys formulating various suggestion in this direction. Chapter aims to help organization arrives at suitable suggestion.

9.2: Policy Formation and suggestions

Devise suggestion pertaining to various aspects based on the outcome of the survey given above and in-depth analysis is given.

9.2.1: Create awareness among the customers about all these modern banking gadgets and their usefulness.

9.2.1.1: Suggestion from section 8.3: Average Values for Key Parameters for Plastic money and virtual wallet user.

The Teenage group characteristic is very different from the rest of others. The average expense on virtual wallet is very low including average usage frequency which means that was your wallet is not used for transportation and selling expenses. The average expense is low in virtual wallet as most of them do not earned the livelihood, but of expense of this group is very high in plastic wallet category which shows that this group spent most on high value transaction which may be electronic goods or similar other categories. So it is good to assume that teenage group can be educated to use the wallet for frequent regular usage and also for high value transaction.

9.2.1.2: Suggestion from section 8.3: Average Values for Key Parameters for Plastic money and virtual wallet user.

Average usage frequency plastic money is low when compared with mobile wallet across various categories that sufficient has not been done to increase the usage of plastic money and for the river and its need to be created in society two increases the usage of these financial instruments.

9.2.1.3: Suggestion from section 6. Customers' awareness level.

Users are almost looking for maximum number of features and none of the feature is very far from the average. It is important to increase the awareness for various features as the masses are looking at various kinds of features and none of these features seems to be very high or low when compared to each other.

9.2.1.4: Suggestion from section 7. Demographic variables and level of awareness.

Higher awareness is seen in young people across age groups. People seem to have higher awareness about the features of the card. But across all group and category the awareness percentage is not high. This means that the significant portion of the work has to go in increasing the awareness across all groups.

9.2.1.5: Suggestion from sections 20. Perception of Plastic money holders, 21. Perception of Virtual card holders and 26. Perceptions factors like security, ease of use, convenience.

There is also a problem with loading mobile wallets as people do not seem to have a definite opinion on the subject half of them feel that it is still difficult to load cash in mobile wallet. This can be overcome with education.

9.2.1.6: Suggestion from section 24. Technical factors like features that determine use of these instruments., 3. Awareness about getting a new plastic money card. 5.

Awareness about benefits of using the cards

Comparison between mobile wallets and plastic money clearly shows the emergence of virtual wallet over plastic money when data is normalized. This indicates that there is a clear role of Technology and consequently mobile wallets food for the defect of digital technology based transactions in the long run. As there are associated risk apprehensions from a large segment of customers it is important to educate a message about future in detail.

9.2.2: Educate the customers in order to wipe out the wrong perception, if any, on plastic money and virtual wallet services.

9.2.2.1: Suggestion from section 8.3: Average Values for Key Parameters for Plastic money and virtual wallet user.

Average values of usage frequency in plastic money are significantly lower than the value in other category mobile wallet. From this it is evident that plastic money is used for high value purchases as the value of average expense is significantly higher for plastic money.

As a matter it is important to educate the customer that even mobile wallet can be used for high value transaction. Same data also highlights that the plastic money is not adequately used in most of the cases because of the very fact that plastic money average frequency of usage is much then mobile wallet even though plastic money has been in existence for quite some time bankers have not done adequately to promote usage of plastic money across various demographic categories.

9.2.2.2: Suggestion from section 8.3: Average Values for Key Parameters for Plastic money and virtual wallet user.

Usage of plastic money and mobile wallet decreases with age and is particularly evident uses whose age is greater than 70. It shows that bank has not met much for people in 70 plus age group and there is scope for educating and **carrying special education classes** for 70 plus age group.

9.2.2.3: Suggestion from section 8.3.1: Chi Square test for key parameters.

Education and profession have influence on plastic money usage. Step should be carried out to adequate general mass of people so that they are more comfortable in using plastic money and widgets. For virtual wallet Gender and profession seems to have a significant impact on spending habits. Education would you be able to change the perception of the people over and over again and that change significant factor. At present the gadget things to be positive and targeted at particular profession and education. Demonetization strategy if any must be such that all the groups across all demography must be comfortable in using the card and there should be no significant factors influencing the use of card and mobile wallet.

9.2.2.4: Suggestion from section 8. Banking services usage profile variables and level of awareness - high and low.

Cash intensive economic is evident from all aspects as people are interested in making electric payment using credit card and debit card and means scores are significantly low then much other economy around the globe. The table shows that a lot needs to be done to increase expenses using electronic media and cards in the country and special emphasis has to be given on payment which of repeat nature like transportation accept as these categories fair very less when compared to others.

9.2.2.5: Suggestion from section 10. Gender and possession of large number of cards (more than one).

Survey not only takes into account a single card user but also give focus on multiple card uses in fact those users who have multiple cards have slight different tendency when it comes to the usage and other aspects related to cards. This section deals with people who have multiple cards. Gender, education, occupation have influence on the use of multiple cards while age does not. This means that frequent usage of card, higher education and particular occupation would have a tendency to increase the card usage and to process multiple cards as this may be people who have sufficient confidence in the use of card. This indicates that there is some wrong perception on the usage of credit card debit cards and that is why people have only one card many a times. Proper education helps users using Debit Card and Credit Card wisely and that avoid death trap another problem associated with in proper use of card.

9.2.2.6: Suggestion from section 16. Gender and Preference for particular wallet.

When it comes to wallet Gender seems to be the only influencing factors to have multiple wallets and education and occupation does not. People at younger age group are more likely to have multiple wallets. Awareness about different types of wallets and their features would help eliminate search caps and also remove the wrong perception that all wallets are same.

9.2.2.7: Suggestion from section 20. Perception of Plastic money holders, 21. Perception of Virtual card holders 26. Perceptions factors like security, ease of use, convenience.

The things to be comfortable difference in perception of people when it comes to usage of cards and wallets for example the debit card user considered much satisfied than credit card user. Indians do not show lot of concerns about credit rating and do not know the credit code many times. High cost expenditures like medical sector encouraged uses usage of cards which is probably not the correct use of cards. Usage of cards is higher or

during seasonal festival Dussehra. Most used things that the charge is undesirable. Many users carry card but it also shows that they don't always carry card. Cards and also not used extensively country which Metro that the people are not aware of features to make international payment and transactions and also in currency conversion as they go from one country to another. Uses and not satisfied with the cards and that is only a reflection from the previous point highlighted in various sections. Questionnaire on Satisfaction also hold this value. More males are satisfied at younger age group with cards as compared to females; this pattern is reversed in people at higher age. Many card users have shared details with others and the card has been used by other people in the family which is not correct use of the card. Good service is one of the reasons for sticking to a particular bank but a majority of a customer feels that start with the bank. Suitable corrective action should be taken in each of these factors to ensure that people get over the state by using the card I have to better experience while using the card. Young people are likely to ask for more number of features and it is pertinent to educate them about new and upcoming features.

9.2.2.8: Suggestion from section 27. Education and awareness about the use of these instruments that affect the use.

Account both categories it is evident that most of the transaction is done for shopping which is not correct use of only instrument. Both the financial instruments have a role to play in every aspect of her life and that it is evident that a lot of education as well as advertisement is used in the shopping space shopping does give uses financial motivation in the form of discounts to encourage the use of various electronic financial transaction but such instruments or motivation are absent in other category. Cards and wallets are perceived useful for mainly shopping which is not true and there are definite financial benefits while using the electronic transaction our daily life across all categories and proper education advertisement can help eliminate such a mindset optical masses.

9.2.3: Strengthen the security aspect involved in all such gadgets which is the main concern of the customers for using those gadgets.

9.2.3.1: Suggestion from section 8.3: Average Values for Key Parameters for Plastic money and virtual wallet user.

The average frequency of usage of plastic money is significantly lower and upper for the analysis it is also written that security as one of the concerns that need to be address. Both of these findings lead to the conclusion that the security aspects involved in the usage of all the gadget including plastic money should be of utmost importance. Further research is required to understand the concerns of the customer when it comes to security. Additional features can be incorporated to address the concerns of customers.

9.2.3.2: Suggestion from section 6. Customers' awareness level.

When it comes to Security Company should try striving to get new features in security for the customers. Security was one of the top most ask this section.

9.2.3.3: Suggestion from section 20. Perception of Plastic money holders 21. Perception of Virtual card holders and 26. Perceptions factors like security, ease of use, convenience

Users are not very confident with security as the scores are average. That does not show very high confidence level in the usage and it is reflected in uses action with the cards.

People who are worried about security are less likely to carry about their card to various places.

9.2.3.4: Suggestion from section 8.3.11: Perceptions factors like security, ease of use and convenience.

A lot of features are available in the plastic wallet space that encourage people to use a variety of security but the thing is absent in mobile wallet. Users are not aware of wallet security and there is urgent need to do more to ensure the confidence of people.

9.3: Summary

Chapter 8 is used to divide the various suggestion to create awareness among the customers about all the modern banking Gadgets and their usefulness it also helps in creating a strategy around education of customers to wipe out the wrong perception. With recommendations security aspects involved in all south credit and also address the concerns of the customers by using the gadgets.

Chapter Ten: Conclusion and Future Research

Chapter Ten: Conclusion and Future Research

10.1: Overview

This chapter ends with the conclusion by giving a brief idea of what needs to be done for mobile wallet users as well as plastic money users. It also highlights the future research scope and that space is infinite for the research. Each of the resultant idea can be extended over the geographical areas to consider the various geographical choices and answers that lead to the usage the virtual wallet and plastic money a little different from what is done in the Bengaluru region.

10.2: Conclusion

On the basis of the findings of the study, the bankers and banking stakeholders involved in formulating objectives, policies and suggestion will gain from the findings of the research and get benefits to take valuable decisions. Hence there will be able to make informed decision that leads to better awareness of banking products, highlights the need for education and increase the usage of debit/credit cards and virtual wallets. Customers would also like more features that help them select the right mobile wallets and cards for their personal needs. The findings of this research will help the new startups in the mobile banking space and help them to provide value added services and features in line with the customer's awareness and education levels across various age groups and other demographic factors. Mobile applications with inbuilt payment solutions or payment add on can also benefit from the findings given in the research. Not only the beneficiaries will be keen to take the advantages of features of mobile wallets and new credit and debit card facility the activities or the banking and non-banking institutions would pave the way to a better and happier banking customer base provided the bankers and stakeholders and various agencies prioritize the need of the people. Also the stakeholders who feel these activities there is little scope for improvement in few areas may be motivated to think again to adopt new strategic activities as a strategy for their growth. In fact, this study will help understanding the role of Banking sector in the betterment of the country. The relevance of this Project can be extended to other non-banking segments.

Level of awareness among the banking customers pertaining to use and Benefits of plastic money and virtual wallet services is a determining factor that decides the growth pattern of business and the survey shows a similar pattern for these financial products like namely plastic money and virtual wallet. A detailed analysis was carried out using Principal component analysis which shows the two most trending factors as Global Acceptability and EMI options. This scores better and clearly shows that globalization and consumerism is creating ripples in the society and there is a growing demand for features which help the rise of Global Indian travelers and boom of commerce and trade which would also include the digital commerce as well. Globalization is directly linked to the assessment of uses and benefits of plastic money and acceptability of cards have increased over the years. This is evident in the high usability and EMI options which shows the high benefits side of debit cards and credit cards.

Level of awareness among the Virtual wallet customers is relatively lower when compared to other well established means of value exchange like plastic money. This is evident when users were asked about benefits, security features and many other parameters on virtual wallet. Details are covered in the 8.3.16: Reason for not having a card (Non users)

Category: Non Users		
Action	Reason for not having cards (150 respondents)	
No	Reason	Percentage
1	Very young / Not earning	6
2	Not requires as uses family member's cards or cash	12
3	Do not have document for KYC/ID	16
4	Low income	5
5	Peace of mind and no need to maintain credit score or charges on cards	18
6	Financing purchases can lead to bad spending or over spending	9
7	Others/ Unanswered	34

Plastic Money and Virtual Wallet		
Urban Bias and Rural Behavior		
To access the difference in mean for urban and rural along with key indicators		
U= Urban		
R= Rural		

8.3.17: Urban Bias and Rural behavior

Further analysis was carried out by separating the urban and rural population to ascertain if there is a significant difference in the way urban and rural population would use credit and debit cards. A comparison of various factors was carried out for Bengaluru Urban and Rural Areas. To get a complete view some of the areas at fringes of the Bengaluru district was included in Rural areas though these may not be distinctly marked as rural but matches with other Rural areas in Bengaluru district. The summary of the analysis is given below.

P= Plastic Money				
V= Virtual Wallet				
In Percentage or Likert or Score				
Analysis	Criteria	Urban	Rural	Info
Urban and Rural	Percentage			According to the 2001 census, the total population of the district was, 1,881,514 of which 21.65% were urban. Source is wiki
		21.65	78.35	
Urban and Rural	Percentage	22.65	77.35	
Economic factors like Growth and Saving	Percentage Difference in group mean from survey mean	-5	5	Up to five percentage difference/variance from combined sample mean is seen in the survey of Urban and rural population for Plastic Money
Technical factors that determine use of these instruments		-3	3	
Demographic factors like age and how it affects the usage and adoption of cards.		-5	5	
Perceptions factors like security, ease of use, convenience		-4	4	
Education and awareness about the use of these instruments that affect use		-5	5	
Economic factors like Growth and Saving	Percentage Difference in group mean from survey mean	-9	9	Up to nine percentage difference/variance from combined sample mean is seen in the survey
Technical factors that determine		-7	7	

use of these instruments			of Urban and rural population for Virtual Wallet
Demographic factors like age and how it affects the usage and adoption of cards.	-3	3	
Perceptions factors like security, ease of use, convenience	-4	4	
Education and awareness about the use of these instruments that affect use	-5	5	

How to interpret the table: Negative or positive five percent for urban or rural shows that the urban population is behaving slightly differently to given indicators from the mean values (calculated after combining both rural and urban data). Thus one group is more likely to be influenced by the factor than the other.

8.4 Findings section of and 8.3.11: Perceptions factors like security, ease of use and convenience. These findings lead to the formation of suggestion in section 9.2.1.3: Suggestion from section 6. Customers' awareness level. and few other in the same section.

Perception and preference of banking customers (both users and non-users of plastic money or virtual wallet services) is the next item emphasized and studied in the research. India is a unique nation with diversity. According to stats released by RBI on 10th March 2016: Total number of deposit accounts (includes term deposits) is 1,440 million. Savings bank accounts in 2015 was 1,170 million. In a unique nation like India, it is the need of the hour to understand what people want from credit/debit cards and

mobile wallets. This coupled with the innovation in digital space can work wonders for the country. This nation and its people have traditionally preferred to save and rely on cash and gold for centuries. Changes in the society, consumption patterns, global influence, innovation in financial instruments and payments, as well as changing perception of men and women are pointing out that the country needs better **suggestion to augment the use of plastic money and mobile wallets.**

Even when the financial inclusion drive is considered successful in India and many new accounts have been opened, the utilization has been poor. In fact, many people have opened account for receiving government subsidy directly into the account and not regularly using the accounts. The perception of the people plays a critical role in determining which banking products would be successful. Thus the idea is **to analyze the perception and preference of banking customers on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.**

Finally, the most important task is to identify the suggestion that would work well in India. In this respect it is imperative to use the data collected is analyzed to distill the whole idea into quantifiable and actionable tasks. This way we **have to identify, on the basis of analysis of perception, the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.**

Plastic money and virtual wallets are important financial instruments that can expedite transaction, money transfer, remittance, payments and can also act as a business driver. India is still lagging in many metrics and the financial freedom is a far-fetched idea for many individuals. The research highlights key points which can be used to increase the circulation and use of financial products and drive both regional growth as well as GDP of the country.

1. The levels of awareness about financial instruments is low in India and the research aims at finding the pulse of the masses

2. To uncover hidden motivations in the use of plastic money and virtual wallet.
3. Find out about the usage patterns of the plastic money and virtual wallet in India.
4. Listen to the banking customers and find out about the features that customers are looking for when they use plastic money or virtual wallet.
5. Find out the perception of the individuals and groups pertaining to the services.
6. Discover the factors that deter the use of modern banking gadgets.
7. Figure out why the banking customers still prefer to go to the bank when there are so many technological innovations that can make our life easy.
8. Discover the underline principles of consumer behavior.
9. The consumer is similar and different in many respects and specific consumer segment has specific needs which govern the success of business.

Customer centric behavior of the companies and help the companies create the right product for the right segment of the society. In this research the area chosen is Bengaluru which is a cosmopolitan society with people from all over the world coming to the information technology capital of India in search of jobs and pursues their dream. As of today Bengaluru is the second largest tax payer in the country followed by Mumbai as the city grows due to the global expansion of business and new companies booming in this city. The city has high literacy rate close to ninety percent of the population and high male and female literacy rate. High literacy rate makes it conducive to banking and the active use of banking and mobile banking or related products.

- Find ways to increase the use of plastic money and services and virtual wallet.
- Target customer segment: Retail customers in India.
- Service Channels: credit or debit card and virtual wallet.

[1] Literacy rate for Bengaluru was taken from
<http://www.census2011.co.in/census/district/242-Bengaluru.html>

Based on the analysis of perception, the following key actions are identified.

1. Create **awareness** among the customers about all these modern banking gadgets and their usefulness.
2. **Educate** the customers in order to wipe out the wrong perception, if any, on plastic money and virtual wallet services.
3. Strengthen the **security** aspect involved in all such gadgets which is the main concern of the customers for using those gadgets.

As analyzed and discussed in the study, it is inferred that there is a seeable improvement required for creating awareness amongst users as well as non users. Key Points are given below.

Create awareness among the customers about all these modern banking gadgets and their usefulness.

- ✓ Teenage group can be educated to use the wallet for frequent regular usage and also for high value transaction.
- ✓ Average usage frequency plastic money is low when compared with mobile wallet and average usage of Plastic Money can be increased.
- ✓ Increase the awareness for various features
- ✓ Significant portion of the work has to go in increasing the awareness across all groups.
- ✓ Loading mobile wallets is difficult for some people. Needs education.
- ✓ Emergence of virtual wallet over plastic money and more features needed

As analyzed and discussed in the study, it is inferred that there is a seeable improvement required for educating users as well as non users. Key Points are given below.

Educate the customers in order to wipe out the wrong perception, if any, on plastic money and virtual wallet services.

- ✓ Educate the customer that even mobile wallet can be used for high value transaction
- ✓ Carrying special education classes for 70 plus age group.
- ✓ Education and Occupation have influence on plastic money usage. . For virtual wallet Gender and Occupation seems to have a significant impact on spending habits. Demonetization strategy if any must be such that all the groups across all demography must be comfortable in using the card.
- ✓ Frequent usage of card, higher education and particular occupation would have a tendency to increase the card usage and to also likely to process multiple cards. Education is required to prevent wrong usage of cards.
- ✓ Awareness about different types of wallets and their features would help eliminate search caps and also remove the wrong perception that all wallets are same.
- ✓ Cards and wallets are perceived useful for mainly shopping which is not true and there are definite financial benefits in other usage as well.

As analyzed and discussed in the study, it is inferred that there is a seeable improvement required to strengthen security. Key Points are given below.

Strengthen the security aspect involved in all such gadgets which is the main concern of the customers for using those gadgets

- ✓ Additional features can be incorporated to address the concerns of customers.
- ✓ People who are worried about security are less likely to carry about their card to various places.
- ✓ Plastic wallet space that encourage people to use a variety of security but the thing is absent in mobile wallet

Benefits of Research Findings

- ✓ On the basis of the findings of the study, the stakeholders would be made aware of the usage and awareness factors.
- ✓ The findings of this research will help in shaping new policies and practices for better perception management.
- ✓ In fact, this study will help in creating new plans and strategies based on suggestions provided in the study.
- ✓ The relevance of this Project can be extended to other financial instruments.

10.3: Scope for Future research

Cards and wallets payment features are increasingly using additional devices, tags, QR code readers and NFC communication which are clearly helping in the usage and proliferation of electronic payments. Future research can be done to access the usefulness and detect usage issues around these extensions.

Similar research can be extended to compare two countries and a wide range of factors can be compared.

Focused research can be done to find out the core differences post demonetization.

Gap analysis can be done in wallet spending patterns for next few years to analyze the differences in usage patterns with rapid technological innovation in payment industry each year.

10.4 Managerial Implications of Research Findings

Unfolding the reasons for using or not using Plastic Money and Virtual Wallets as modes of payments, the finding of this Study will help in popularizing the digital modes of

payment, off late which has been the slogan of the Indian economy. It will also help the organizations dealing with the Plastic Money and Virtual Wallets to strategize aptly for stretching the incidence and depth of the usage of digital modes of payments. This study takes a look at the impact of various management theories like Technology Acceptance model (TAM) and also does various kinds of analysis to arrive at summary. It also shows how the basic functions and practices of management as well as the role of the manager and approaches to management have contributed to the practice in the Banking industry. The contribution and role of TAM and in management process is highlighted.

10.5: Summary

Cards and wallets have come a long way in the history of mankind to enable payment and move away from currency based system. Cards were used as a convenient mechanism for travel as well as making payment in store. Since then cards have evolved various mechanism and are still evolving at very rapid space with technological innovation in the space of Information Technology as well as networking. Electronic payment is a reality in days to come. Option rate across various sections of society and various groups of consumer will only ensure Rapid progress in the macroeconomic parameters for the country which is very essential in the current age. The measures have to be taken by banks as well as Central Bank to ensure that all the problems of the user psychiatrist have sorted out in the best interest of payment system. Education, security and other aspects as highlighted in this paper play the key to the adoption rate in the country not have a significant bearing on the potential reach and effects of plastic money over the period of time. Credit card fraud and simple electronic have time again decrease the confidence in the payment system which is detrimental and Methodist immediately this can be achieved by increasingly raising the awareness and actively participating with people to reduce them we should include giving and hearing how people perceive threat and how the threat can be mitigated by introducing new features.


The study concludes after suggesting various suggestions that will have long term impact in the payment industry.

Appendices

Appendices

Appendices I- Survey Questionnaire of Plastic Money in and around Bengaluru City

Research Question for Plastic Money



Questionnaire For Customer Survey On Credit and Debit card usage

Dear respondent, I am Surya Kesh, Research Scholar, pursuing Ph.D. on mobile banking and plastic money, with ICFAI University Jharkhand. I earnestly request your valuable time and attention for filling the questionnaire. Kindly read the question carefully before choosing your response for the question and tick (✓) the appropriate box as per your understanding, experience, & perception related to the topic. Please answer all the questions as honestly as possible. Your help is highly solicited to make the study meaningful. If you require additional information or have any query, please feel free to contact me at surya_kesh@yahoo.com

Name (Optional)

Age

Gender

☐ Male

☐ Female

Relationship status? (optional)

- ☐ Married
- ☐ Single
- ☐ Other

Profession

- ☐ Salaried
- ☐ Self Employed
- ☐ Other:

Annual income

- ☐ Below 1 lakh
- ☐ 1 to 3 lakh
- ☐ 3 to 5 lakh
- ☐ 5 to 10 lakh
- ☐ 10 lakh and above

Educational qualification

- ☐ 10
- ☐ 10+2
- ☐ Graduation Degree
- ☐ Master Degree
- ☐ Ph.D

Do you use any of them

- ☐ Debit Card
- ☐ Master Credit Card
- ☐ Visa Credit Card
- ☐ Have more than 4 cards
- ☐ All of the above
- ☐ Other:

How long have you been using the cards?

Who uses your card?

- ☐ Spouse
- ☐ Kid
- ☐ Parents
- ☐ Other:

How do you rate the level of your happiness with your Cards?

1 2 3 4 5

Not happy at all ☐ ☐ ☐ ☐ ☐ Very happy with the card

Would you prefer to get a Credit Card or Debit Card from your preferred bank? (provide bank's name)

Which feature excites you the most in credit card and debit card?

How many times do you use credit or debit card in a week?

What is your average expenses using credit or debit cards every week?

Do you prefer to use debit and credit card for the following

	Debit Card	Credit Card
Food	<input type="radio"/>	<input type="radio"/>
Transport	<input type="radio"/>	<input type="radio"/>
Aparel and shopping	<input type="radio"/>	<input type="radio"/>
Rent	<input type="radio"/>	<input type="radio"/>
Loan Payment	<input type="radio"/>	<input type="radio"/>
Electronics	<input type="radio"/>	<input type="radio"/>
Book Holiday	<input type="radio"/>	<input type="radio"/>
Others	<input type="radio"/>	<input type="radio"/>

Do you use credit card to withdraw money?

- ☐ Yes
- ☐ No

Do you want to increase your credit limit?

- ☐ Yes
- ☐ No

Are there hidden costs in your debit and credit card transaction?

- ☐ Yes
- ☐ No

Do you feel, you are stuck with your bank? If yes, why do you think so?

- ☐ Always used this bank
- ☐ Good Service
- ☐ Have poor credit rating, so cannot go elsewhere
- ☐ It is linked with my loan
- ☐ Creating new account is not easy
- ☐ Good for online transaction
- ☐ Good rewards
- ☐ Other:

How do you rate the following parameters while applying for credit and debit cards?

	Very undesirable	Undesirable	neutral	Desirable	Very desirable
Easy payment method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety is paramount	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rewards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simplicity of use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fuel surcharge waver	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Airline Miles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diner and luxury items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Global acceptability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multicurrency card	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
EMI option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supported by most vendors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Great offers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Card replaced before expiry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are the annual Fees & Other charges good value for money?

- ☐ Value for money
- ☐ Fees Acceptable
- ☐ Very high charges and fees

How confident are you that your personal information will not be stolen?

1 2 3 4 5

Data would not be stolen ☐ ☐ ☐ ☐ ☐ Not confident in using it

What do you use credit and debit card for?

- ☐ Transfer Money
- ☐ Mobile recharge and online Sales
- ☐ Entertainment and Luxury item
- ☐ Shopping in stores
- ☐ Banking Transaction and trading
- ☐ Health
- ☐ Education
- ☐ Other

What are the advantage of credit and debit card?

- ☐ Purchases easy
- ☐ Coupons
- ☐ Expense mangement
- ☐ Generate electronic receipts
- ☐ Get rewards
- ☐ Other:

Do you buy more when you get discount coupons?

- ☐ Yes
- ☐ No

Do you always carry your debit or credit with you?

- ☐ Yes, I always carry both debit and credit card
- ☐ Sometimes I carry one of the cards
- ☐ I use cash often and not my card

Do you make international money transfer using plastic money?

- ☐ Yes
- ☐ No

Which credit card do you have ?

- ☐ HDFC bank
- ☐ ICICI Bank
- ☐ City Bank
- ☐ SBI Bank
- ☐ Standard Charter Bank
- ☐ HSBC Bank
- ☐ Other:

Which debit card do you have ?

- ☐ HDFC bank
- ☐ ICICI Bank
- ☐ City Bank
- ☐ SBI Bank
- ☐ Standard Charter Bank
- ☐ HSBC Bank
- ☐ Other:

Do you know your credit score?

- ☐ Yes
- ☐ No

Was it easy to apply for credit or debit card?

- ☐ Not easy
- ☐ Easy
- ☐ Very easy, minimal documentation

Is Transaction cost on your cards right?

- ☐ Very high charge
- ☐ Acceptable charges
- ☐ Other:

Your average Credit Card bill for last 6 months?

Do you know the factors to look at before you apply for Credit Card In India?

- ☐ Interest rate charged
- ☐ Annual Fees & Other charges
- ☐ Rewards and Offers on Card
- ☐ Customer Service and Transparency
- ☐ Convenience to pay the bills
- ☐ Other:

What do you do to secure your card?

- ☐ Fix limit on card
- ☐ User virtual keyboard
- ☐ Use Images
- ☐ Memorize CCV number
- ☐ Transaction alerts
- ☐ User virtual card
- ☐ Access website link directly
- ☐ Do not have photocopy of card
- ☐ Block card when phone is stolen
- ☐ Transaction password
- ☐ Other:

Which feature you would like to add to Credit or Debit card (Plastic Money)?

Please suggest ways to improve Credit or Debit card (Plastic Money)?

How do you rate the following parameters?

	Very undesirable	Undesirable	Neutral	Desirable	Very Desirable
Do you prefer Plastic Money to Physical Visit to Bank Branches?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of Safety is responsible for opting for Plastic Money?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of Surcharge is responsible for you opting for Plastic Money to full potential?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extensive Support of Banks is responsible for you to opt for Plastic Money?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During which festival do you use Credit or Debit card (Plastic Money)?

Which debit or credit card would you recommend for friends and family?

What is your financial goal this year?

- ☐ Car / home/ personal Loan
- ☐ Saving for future
- ☐ Improve credit rating
- ☐ Pay off debt
- ☐ Other:

Submit

Research Question for Mobile wallet



Questionnaire For Customer Survey On Mobile Wallet

Dear respondent, I am Surya Kesh, Research Scholar, pursuing Ph.D. on mobile banking and plastic money, with ICFAI University Jharkhand. I earnestly request your valuable time and attention for filling the questionnaire. Kindly read the question carefully before choosing your response for the question and tick (✓) the appropriate box as per your understanding, experience, & perception related to the topic. Please answer all the questions as honestly as possible. Your help is highly solicited to make the study meaningful. If you require additional information or have any query, please feel free to contact me at surya_kesh@yahoo.com

Name (Optional)

Age

Gender.

- ☐ Male
☐ Female

Relationship status? (optional)

- ☐ Married
☐ Single

Profession

- ☐ Salaried
- ☐ Self Employed
- ☐ Student

☐ Other:

Annual income

- ☐ Below 1 lakh
- ☐ 1 to 3 lakh
- ☐ 3 to 5 lakh
- ☐ 5 to 10 lakh
- ☐ 10 lakh and above

Educational qualification

- ☐ 10
- ☐ 10+2
- ☐ Graduation Degree
- ☐ Master Degree
- ☐ Ph.D

Which mobile wallet you use?

- ☐ Airtel money
- ☐ M pesa Vodaphone
- ☐ Irctc wallet
- ☐ SBI wallet

☐ Other:

How many times do you use mobile wallet in a week?

What is your average spent using mobile wallet every week?

Which feature excites you the most in credit card and debit card?

For what do you pay using mobile wallet ?

- ☐ Food
- ☐ Transport
- ☐ Apparel and shopping
- ☐ Rent
- ☐ Loan payment
- ☐ Electronics
- ☐ Book Holiday
- ☐ Other:

Do you use wallet for shopping?

- ☐ Yes
- ☐ No

Give your view on the following Parameters concerning "Why you use Wallet?"

	Poor	Average	Good	Very Good	Excellent
Easy payment method	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety is paramount	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Open Wallets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessible from laptop and mobile	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rewards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Simplicity of use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are the annual Fees & Other charges good value for money?

- ☐ Value for money
- ☐ Fees Acceptable
- ☐ Very high charges and fees

How confident are you that your personal information will not be stolen?

1 2 3 4 5

Data would not be stolen ☐ ☐ ☐ ☐ ☐ Not confident in using it

What do you use Mobile wallet for?

- ☐ Transfer Money
- ☐ Mobile recharge and online Sales
- ☐ Entertainment and Luxury item
- ☐ Shopping in stores
- ☐ Banking Transaction and trading
- ☐ Health
- ☐ Education
- ☐ Other

What are the advantage of Mobile wallet

- ☐ Purchase
- ☐ Alerts like coupons and alerts
- ☐ Expense management
- ☐ Generate electronic receipts
- ☐ Compare and shop
- ☐ Store loyalty card
- ☐ Get Location based offer

Do you buy more when you get discount coupons?

- ☐ Yes
- ☐ No

Do you always carry your mobile wallet with you?

- ☐ Yes, Always
- ☐ Sometimes
- ☐ No, Never

Do you make intentional money transfer using wallet?

- ☐ Yes
- ☐ No

Is it easy to buy mobile wallet and load money?

- ☐ Yes
- ☐ No

Which feature you would like to add to mobile wallet?

Please suggest ways to improve mobile wallet?

How do you rate the following parameters?

	Very undesirable	Undesirable	Neutral	Desirable	Very Desirable
Do you prefer Virtual Wallet to Physical Visit to Bank Branches?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of Safety is responsible for opting for Virtual Wallet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amount of Surcharge is responsible for you opting for Virtual Wallet to full potential?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extensive Support of Banks is responsible for you to opt for Virtual Wallet?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you rate the following parameters?

	Very undesirable	Undesirable	Neutral	Desirable	Very Desirable
(U) Using the virtual wallet improves financial management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(U) Using the virtual wallet saves time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(U) Using the virtual wallet makes payment easy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(U) Using the virtual wallet gives me control of my expense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(U) Using the virtual wallet gives alternate to checks and going to banks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(E) It is easy to use virtual wallet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(E) It is convenient to use virtual wallet as multiple cards and accounts are linked	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(E) It is convenient to use virtual wallet as multiple cards and accounts are linked	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(E) It is usual for me to use virtual wallet for payments daily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(E) I use virtual wallet in many ways like bill payments , shopping etc	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(A) The payment process is simplified and defined	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(A) Decision to use which account is easy with Virtual wallet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(A) Virtual wallet gives various actions to make things easy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(A) Would like to use the virtual wallet regularly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(B) It is easy to interact with with virtual wallet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(B) I am completely satisfied using the virtual wallet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(B) I can comfortably handle Virtual wallet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(B) I Can complete all payments easily using Virtual wallet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(B) Believe this would help the payment industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

During which festival do you use mobile wallet frequently?

Which mobile wallet would you recommend for friends and family?

Submit

Appendices III Sample Size

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2 \cdot (N - 1) + z^2 \cdot p \cdot q}$$

Where,

n = Sample Size, **N** = Population Size (about 8.52 million), **z** =1.96 (standard variate for Confidence level of 95%), **e** = 0.05 (precision or acceptable error), **p** = 0.7 (Sample proportion or approx. no of banked individual), **q** = 1 – p

As per the formula, the sample size is

$$n = 322.69$$

For appropriateness of result, bigger sample size (500+) has been taken up.

Since both Non-Random (Judgmental) and Random (Simple) Sample is used. On the basis of the responses of the beneficiaries/projected beneficiaries, the study is conducted.

Appendices IV PCA (principal component analysis) on Plastic money

Cronbach's Alpha	0.94
Split-Half (odd-even) Correlation	0.82
Spearman-Brown Prophecy	0.90
Mean for Test	57.17
Standard Deviation for Test	6.24
KR21	6.48
KR20	6.56

Pre-processing

Options:

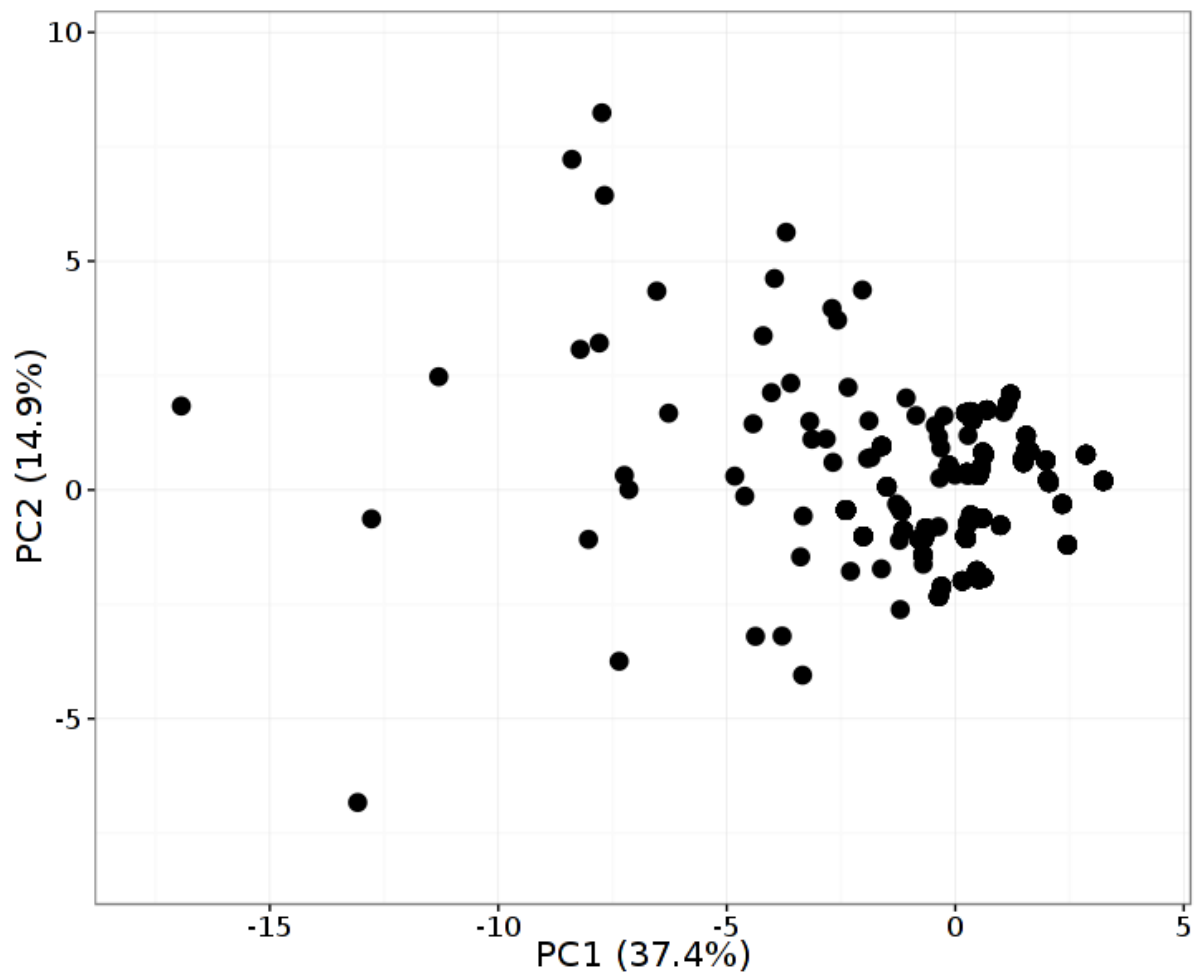
Maximum percentage of NAs allowed in rows:
Maximum percentage of NAs allowed in columns:
Row scaling: Unit variance Scaling
PCA method: SVD with Imputation

Data matrix size:

	Before processing	After collapsing similar columns (if applied)	After removing rows and columns with NAs	After removing constant rows and optionally columns
Rows	13	13	13	13
Columns	599	599	599	599

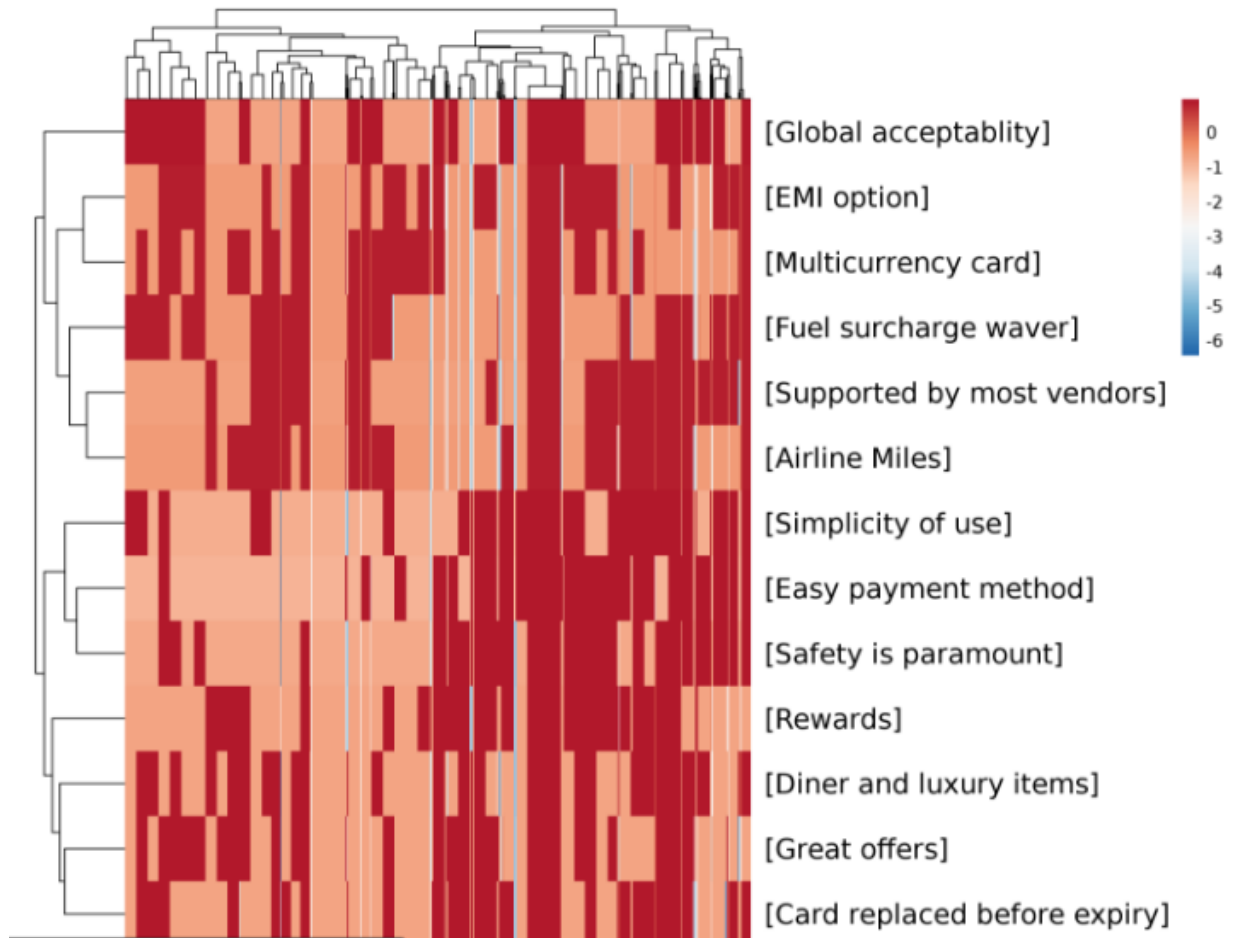
PCA

Unit variance scaling is applied to rows; SVD with imputation is used to calculate principal components. X and Y axis show principal component 1 and principal component 2 that explain 37.4% and 14.9% of the total variance, respectively. N = 599 data points.



Heat map

Rows are centered; unit variance scaling is applied to rows. Imputation is used for missing value estimation. Both rows and columns are clustered using correlation distance and average linkage. 13 rows, 599 columns.



Result of PCA analysis

Global Acceptability and EMI options are the top two features that explain 37.4% and 14.9% of total variance and are likely the most important and contributing factors for users.

Appendices V Technology Acceptance model (TAM)

Questionnaire	Variables
(U) Using the virtual wallet improves financial management	U1
(U) Using the virtual wallet saves time	U2
(U) Using the virtual wallet makes payment easy	U3
(U) Using the virtual wallet gives me control of my expense	U4
(U) Using the virtual wallet gives alternate to checks and going to banks	U5
(E) It is easy to use virtual wallet	E1
(E) It is convenient to use virtual wallet as multiple cards and accounts are linked	E2
(E) It is convenient to use virtual wallet as multiple cards and accounts are linked	E3
(E) It is usual for me to use virtual wallet for payments daily	E4
(E) I use virtual wallet in many ways like bill payments, shopping etc.	E5
(A)It is easy to interact with virtual wallet	A1
(A)I am completely satisfied using the virtual wallet	A2
(A)I can comfortably handle Virtual wallet	A3
(A)I Can complete all payments easily using Virtual wallet	A4
(A)Believe this would help the payment industry	A5
(B) The payment process is simplified and defined	B1
(B) Decision to use which account is easy with Virtual wallet	B2
(B) Virtual wallet gives various actions to make things easy	B3

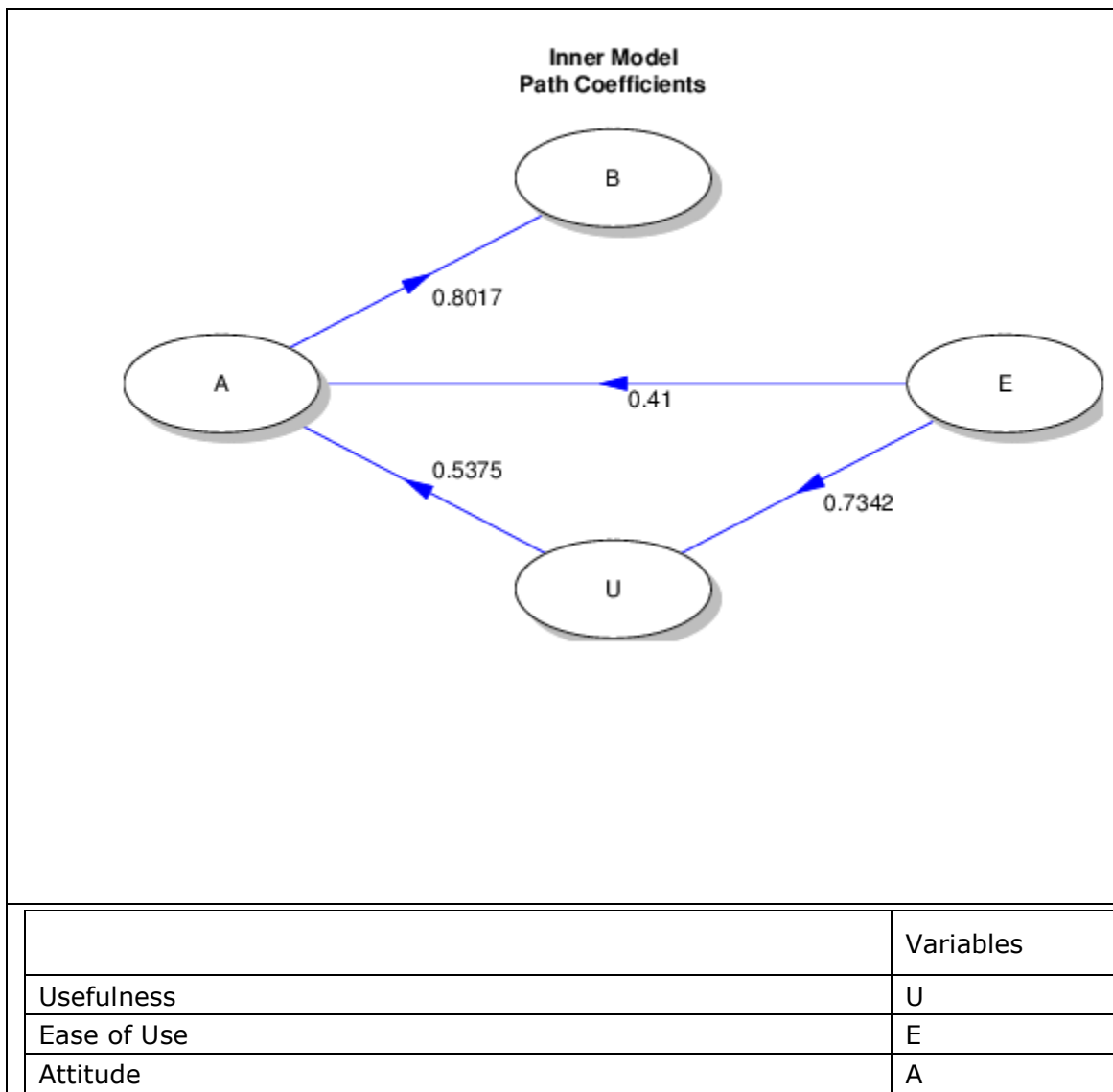
(B) Would like to use the virtual wallet regularly	B4
--	----

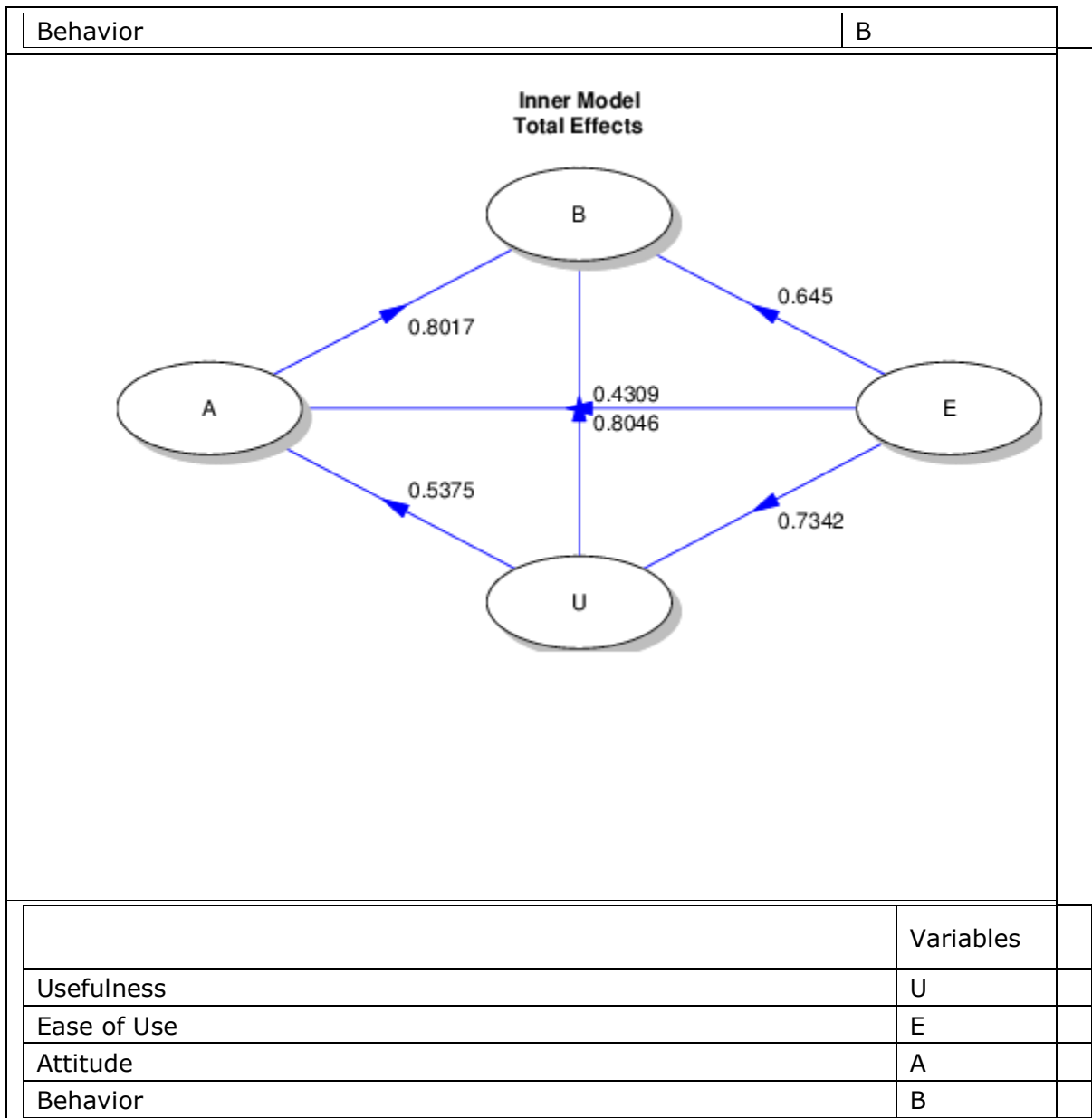
Cite this software:
Wessa P., 2014, Partial Least Squares - Path Modeling (v1.0.9) in Free Statistics Software (v1.1.23-r7), Office for Research Development and Education, URL
http://www.wessa.net/rwasp_partial_least_squares.wasp/

Summary of computational transaction	
Raw Input	view raw input (R code)
Raw Output	view raw output of R engine
Computing time	19 seconds
R Server	'Sir Ronald Aylmer Fisher' @ fisher.wessa.net

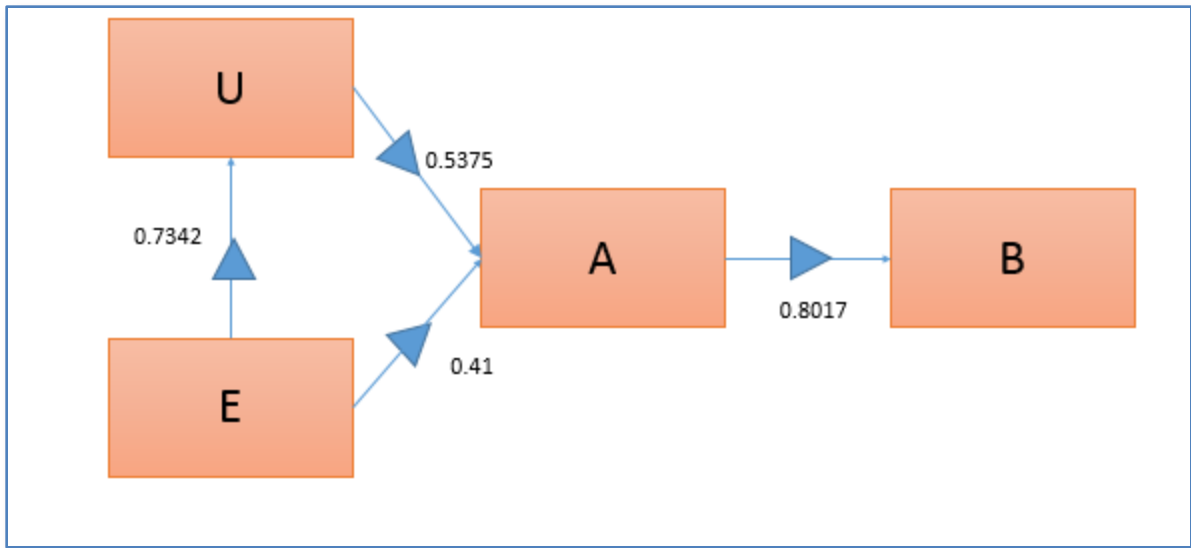
PARTIAL LEAST SQUARES PATH MODELING (PLS-PM)	
MODEL SPECIFICATION	
Number of Cases	566
Latent Variables	4
Manifest Variables	19
Scaled?	TRUE
Weighting Scheme	centroid

Bootstrapping?	
Bootstrap samples	





TAM model (Technology Acceptance Model)



	Variables
Usefulness	U
Ease of Use	E
Attitude	A
Behavior	B

Appendices VI Tables

Appendices VII Finding mapped to table

Final Survey: Findings

Awareness, cost, demography, features, perception, preference, security, suggestion and usage have to be analyzed in depth. Important findings are.

Objective 1a and Findings

To assess the level of awareness among the banking customers pertaining to;

Plastic Money – Its Use and Benefits

1. Above fifty percent people are not fully aware of the benefits of card and can list one or two card features. (Table 19 Advantage of credit and debit card)
2. People use the card 2 times every week for debit and credit cards. (Table 16 Average value of key parameters in final survey)
3. The average spend is mobile around Rs.1000. (Table 16 Average value of key parameters in final survey) and increasing at a good rate every year.
4. Five of Six people including both male and female used one card only. (Table 26 Preference to use card and Card Usage)
5. No significant correlation in between detail of demographic factors. (Table **116** Correlation table)
6. Respondents have used the card for medical bill payments and followed by shopping. (Table 23 prefer to use debit and credit card for particular category)
This may be indicating higher health care cost and need for immediate payment in hospitals.

7. Around 40 percent of users shared the card with someone like parents, spouse Etc. (Table 54 who uses your card?)
8. Loan Payment and Booking holidays are the top two reasons for using debit and credit card. (Table 56 Another view of what the people do with cards by age Pg. 168)
9. Transaction values shows that mobile Wallet has a far greater acceptance in user and a higher usage and adoption within a short span of last 5 years. (Table 91 Categories of use and usage of wallet)

To assess the level of awareness among the banking customers pertaining to;

b) Virtual Wallet Services – About the Gadget, its Use and Benefits

10. For mobile wallet accessibility, open wallet and ease of payment seems to have the greatest influencing factors and would help in mobile adoption rates. (Table 32 Preference of wallet users Pg.131)
11. Awareness on virtual wallet is similar between married and single people. Self-employed people have high level of awareness as compared to salary people. (Table 36 Demographic – Preference for choosing wallet)
12. Awareness of virtual wallet features is high amount low income user. Education does not seem to have changed the preference for virtual wallet. (Table 36 Demographic – Preference for choosing wallet)
13. None of demographic factors (5 considered like age Etc.) seems to have influence on the number of virtualwallet used by people. Age has influence on particular type of wallet used. (Table 62 Snapshot of few mobile wallets used by respondents)
14. Transfer Money, Mobile recharge and Banking transactions are top three uses of Mobile wallet as stated by respondents. (Table 76 Usage of wallet feature by age)

Objective 2 and the Findings

To analyze the perception and preference of banking customers (both users and non-users of plastic money or virtual wallet services) on transactions through bank branches vis-à-vis through Plastic Money and Virtual Wallet Services.

15. Loan Payment and Booking holidays are the top two reasons for using debit and credit card. When it comes of the people use plastic money for loan payment, electronics, booking holiday Etc. for use very for debit and credit cards. (Table 26 Preference to use card and Card Usage and Table 60 Another view of what the people do with cards by age)
16. While there is a preference for cards people show slightly high preference for credit card at 34 percent over all other cards, number of people who has both credit and debit card is 33 percent as well as only Debit card seems to be significant at 33 percentages. (Table 26 Preference to use card and Card Usage)
17. Most of the users carry cards with them but from the previous analysis it was clear that users carry cards sometimes but not always. (Table 47 Does users always carry cards)
18. Respondents have been using the card for 5 or more years on an average showing high loyalty with cards. (Table 51 Card statistics by age)
19. People have a similar usage patterns for virtual wallet. This parameter does not vary significantly with age. (Table 92 Age and usage and adoption of cards)
20. Users using both debit and credit cards and are likely to be less satisfied than when using either debit card or credit card. (Table 26 Preference to use card and Card Usage and Table 42 Mean Satisfaction Scores Plastic Money) People who use both debit and credit cards have higher expectations and are less happy with the given set of features, also this is the reason for people to go for many cards as they are searching for the best card for a variety of their needs which cannot be fulfilled by just having one card.

21. Respondents use the card for transaction and service and do not show lot of concern over credit rating nor use the card extensively for loan payments. (Table 42 Mean Satisfaction Scores Plastic Money and Table 43 Reasons for patronizing and using the same card and Table 61 Awareness on credit score by age and Table 23 prefer to use debit and credit card for particular category)
22. Respondents to use the same card and retain the bank accounts they have and have used the credit cards to withdraw money. (Table 23 prefer to use debit and credit card for particular category and Table 51 Card statistics by age) most of the respondents have the card for more than 5 years.
23. Males are satisfied with the cards as compared to females in teen and early ages while women are much more content at the 40 to 50 age group. (Table 52 Satisfaction of cards by age)
24. Online transactions, Long association with bank, service are the top three reasons why the respondents keep using the same bank. (Table 56 Why do people use the same bank)
25. Saving for future is one of the primary financial goal for respondents. (Table 58 Users financial goals)
26. People buy more when they get discount coupons. (Table Users buying preference on discounts)
27. There is equally likely chance of using the mobile wallet with or without discount coupons. (Table 75 Likely chance of using mobile with discounts)
28. The spending habits of the set of users using wallet and plastic money does not show huge variation with the increase in salary. (Table 87 Saving propensity by income)
29. Average money spent per week on mobile wallet and cards differ significantly. (Table 88 Descriptive statistics comparing plastic money and wallet). Average spend on plastic money is likely to be 9 times that of wallet but this is about to

change with the push towards demonetization (Table 2 Banking Statistics and Demonetization in India).

30. There is much more predictable and consistent spend for the mobile wallet users (Table 88 Descriptive statistics comparing plastic money and wallet)

Objective 3 and the findings

To identify, on the basis of analysis of perception, the factors that insist the customers not to use the Modern banking gadgets meant for transaction without going to bank branches.

31. On various parameters like safety, surcharge, extensive support by Banks is required to increase the awareness level which specially seems to be high at age below 30. (Table 55 Awareness about factors while applying for card and Table 61 Awareness on credit score by age)
32. Fifty percent chance of always carrying card and high chance of carrying one card. (Table 47 Does users always carry cards). This data is likely to change with the advent of virtual wallet.
33. For both debit and credit cards more than two third of the respondents think that the charges on the cards are undesirable and high. (Table 46 Perception on card annual fees)
34. Equal likely chances of user being neither very satisfied nor very sad with the cards which reflect that there is scope for further improvement. (Table 51 Card statistics by age)
35. As seen 54 percent males and 45 percent of female respondents feel they are stuck with the bank. (Table 59 User perception if they feel they are stuck with the bank)

36. People who are worried of security do not carry the card. Young and a section of mid age people are more confident in carrying. (Table 721 Perception on use and caring the wallet.)
37. Mobile Wallet reload facility satisfaction is divided. Roughly Equal numbers of people are divided in opinion and so it may be the lack of education that people have difficulty in buying and loading mobile wallet. (Table 73 Perception in wallet buying and ease of loading cash)

Appendices VIII- Publication of Scholar in the Area of Research

1. Augment The Use of Plastic Money and Virtual Wallet Services by Emphasizing the Need to Reduce Digital Footprints

International Journal of Computer Architecture and Mobility

ISSN 2319-9229 Volume 3 -Issue 2, April 2015

2. Business Would Drive Use of Plastic Money and Virtual Wallet Services using New Channel

International Journal of Emerging Technology and Advanced Engineering

ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 5, Issue 3, March 2015

3. Measures to augment the use of plastic money and virtual wallet in Bengaluru district of India

Presentation

1. Measures to Augment the Use of Plastic Money and Virtual Wallet Services by Phased and Controlled Technology Investment

UTKARSH' – III, Dr DY Patil School of Management, Pune, Maharashtra.

March 2015

2. Positive Indicator for adoption of Virtual Wallet Services accessed using Technology Acceptance model (TAM) National Conference on People

Management: Emerging Trends in the Current Millennium, ICFAI University

Jharkhand, September 2015

Appendices IX Ph. D. Research Journey

Timeline

S No	Mile Stone	Time Period	Jun-12	Dec-12	Jun-13	Dec-13	Jun-14	Dec-14	Jun-15	Dec-15	Jun-16	Dec-16	Jun-17
1	Course Work 1 & 2 and Literature Survey	June'12 To Nov'12											
2	Registration of	June'13											
3	Review of Existing Literature	June'13 To May'14											
4	Research Design & Questionnaire	June'14 To Sept'14											
5	Pilot Survey	Oct'14 To Dec'14											
6	Main Survey	Jan'15 To Jun'15											
7	Data Analysis & Interpretation	July'15 To April'16											
8	Thesis Writing	May'16 To Dec'16											
9	Pre-submission	Jan'17											
10	Thesis Submission												

References

References

- Abul, M. P. M. D. P., & Parmar, K. (2016). Applications of Data Mining Techniques for Fraud Detection in Credit-Debit Card Transactions.
- AB HAMID, N. R., & CHENG, A. Y. (2020). A risk perception analysis on the use of electronic payment systems by young adult. *order*, 6(8.4), 6-7.
- Awh, R. H. & Waters, D. (1974). A Discriminant Analysis of Economic, Demographic and Attitudinal Characteristics of Bank Charge-Card Holders – A Case Study. *The Journal of Finance*, 29(June), 973-80.
- Al-Bayati, B., Clarke, N., & Dowland, P. (2016). Adaptive Behavioral Profiling for Identity Verification in Cloud Computing: A Model and Preliminary Analysis. *GSTF Journal on Computing (JoC)*, 5(1), 21.
- Aggarwal, S., & Klapper, L. (2013). Designing government policies to expand financial inclusion: Evidence from around the world. Retrieved October, 27, 2014.
- Ahmad, R. (2016). Credit Card Debt Management: A Profile Study of Young Professionals. *Asia-Pacific Management Accounting Journal*, 8(1).
- Bachas, P., Gertler, P., Higgins, S., & Seira, E. (2016). Banking on Trust: How Debit Cards Help the Poor to Save More. Working Paper.
- Bester, H., Chamberlain, D., De Koker, L., Hougaard, C., Short, R., Smith, A., & Walker, R. (2008). Implementing FATF standards in developing countries and financial inclusion: Findings and guidelines (Doctoral dissertation, FIRST Initiative (World Bank)).
- Bachas, P., Gertler, P., Higgins, S., & Seira, E. (2016). Banking on Trust: How Debit Cards Enable the Poor to Save More.

- Carow, Kenneth A. and Michael E. Staten (1999). "Debit, Credit, and Cash: Survey Evidence on Gasoline Purchases," *Journal of Economics and Business*, 51 (5), 409–422.
- Crowther, R. A. (1972). *The Molecular Replacement Method*, edited by MG Rossmann. New York: Gordon and Breach, 173-178.
- Cheney, J. S. (2008). An examination of mobile banking and mobile payments: building adoption as experience goods? FRB of Philadelphia-Payment Cards Center Discussion Paper, (08-07).
- Chakrabarty, K. C. (2012, November). Financial Inclusion: Issues in Measurement and Analysis. In Keynote address, BIS-BNM Workshop on Financial Inclusion Indicators, Kuala Lumpur, November.
- Chibba, M. (2009). Financial inclusion, poverty reduction and the millennium development goals. *The European Journal of Development Research*, 21(2), 213-230.
- Chitungo, S. K., & Munongo, S. (2013). Extending the technology acceptance model to mobile banking adoption in rural Zimbabwe. *Journal of Business Administration and Education*, 3(1), 51.
- Chavan, A. L., Arora, S., Kumar, A., & Koppula, P. (2009). How mobile money can drive financial inclusion for women at the Bottom of the Pyramid (BOP) in Indian urban centers. In *International Conference on Internationalization, Design and Global Development* (pp. 475-484). Springer Berlin Heidelberg.
- Claessens, S. (2006). Access to financial services: A review of the issues and public policy objectives. *The World Bank Research Observer*, 21(2), 207-240.
- Chahal, H., Kaur Sahi, G., & Rani, A. (2014). Moderating role of perceived risk in credit card usage and experience link. *Journal of Indian Business Research*, 6(4), 286-308.

- Davies, C., Doyle, M. A., Fisher, C., & Nightingale, S. (2017). The Future of Cash. The Sensitivity of Personal Income to GDP Growth 1 Factors Affecting an Individual's Future Labour Market Status 11 Measures of Inflation Expectations in Australia 23 The Cash Market 33 The Future of Cash 43, 43.
- Dahlberg, T., & Mallat, N. (2002). Mobile payment service development-managerial implications of consumer value perceptions. *ECIS 2002 Proceedings*, 139.
- Dewri, L. V., Islam, M. R., & Saha, N. K. (2016). Behavioral Analysis of Credit Card Users in a Developing Country: A Case of Bangladesh. *International Journal of Business and Management*, 11(4), 299.
- Desai, M. R. (2016). A Study on Banking Outreach in Rural Area of Tapi District. 2. A Study on Relationship between Financial Literacy and Investment Behaviour of Rural Area People 10-21 Ms. Manisha Surti and Prof.(Dr.) Vinod B. Patel 3. Attitude towards Mobile Advertising of Rural Youngsters of Anand District: An Empirical Study 22-30, 94.
- Demirgüç-Kunt, A., & Klapper, L. F. (2012). Measuring financial inclusion: The global index database. *World Bank Policy Research Working Paper*, (6025).
- De Koker, L., & Jentzsch, N. (2013). Financial inclusion and financial integrity: Aligned incentives? *World development*, 44, 267-280.
- Donovan, K. (2012). Mobile money for financial inclusion. *Information and Communications for Development*, 61, 61-73.
- Demirgüç-Kunt, A., & Klapper, L. F. (2012). Financial inclusion in Africa: an overview. *World Bank Policy Research Working Paper*, (6088).
- Dahlberg, T., Mallat, N., & Öörni, A. (2003). Trust enhanced technology acceptance modelconsumer acceptance of mobile payment solutions: Tentative evidence. *Stockholm Mobility Roundtable*, 22, 23.

- Dermish, A., Kneiding, C., Leishman, P., & Mas, I. (2011). Branchless and mobile banking solutions for the poor: a survey of the literature. *innovations*, 6(4), 81-98.
- Diniz, E., Birochi, R., & Pozzebon, M. (2012). Triggers and barriers to financial inclusion: The use of ICT-based branchless banking in an Amazon county. *Electronic Commerce Research and Applications*, 11(5), 484-494.
- Dr.M. Sadika Sultanaa and Mr.K. Sasi Kumar (2015), An study on customer payment behavior in organized retail outlets at Coimbatore district, *Journal of Management and Science* Vol.5. No.2 June'2015.
- Fessler, P., Lindner, P., & Schürz, M. Eurosystem (2014). Household Finance and Consumption Survey.
- Hancock, Diana and David B. Humphrey, "Payment Transactions, Instruments, and Systems: A Survey," *Journal of Banking and Finance*, 1998, 21 (11-12)
- Gross, M. B., Hogarth, J. M., & Schmeiser, M. D. (2012). Use of financial services by the unbanked and underbanked and the potential for mobile financial services adoption. *Federal Reserve Bulletin*, 98(4), 1-20.
- Gupta, S. (2013). The mobile banking and payment revolution. *European Financial Review*, 2, 3-6.
- Jain, S. (2016). Customers'attitude Towards Plastic Money. *Management Strategies Journal*, 32(2), 79-82.
- JOY, A. (2016). A Study on Customers' Perception Towards Credit Cards. *Indian Journal of Applied Research*, 5(6).
- Jackson, E., Looney, A., & Ramnath, S. (2017). The Rise of Alternative Work Arrangements: Evidence and Implications for Tax Filing and Benefit Coverage.
- Handelsman, Moshe, and J. Michael Munson (1989). "Switching behaviours from credit card to cash payment among ethnically diverse retail customers." *International Journal of Retail & Distribution Management* 17.1 (1989).

- Hannig, A., & Jansen, S. (2010). Financial inclusion and financial stability: current policy issues.
- Hasnain, S. A., Iqbal, Z., Ali, A., & Hussain, Z. (2016). Journal of ISOSS 2016 Vol. 2 (1), 23-32 Customer's Knowledge and Use of Credit Card. Journal of Isoss, 2(1), 23-32.
- Hirschman, E. C. (1979). Differences in Consumer Purchase Behavior by Credit Card Payment System. Journal of Consumer Research, 6(June), 58-66.
- Hirschman, E. C. & Goldstucker, J. L. (1978). Bank Credit Card Usage in Department Stores: An Empirical Investigation. Journal of Retailing, 54(Summer), 3-12.
- Hirschman, E. (1982). "Consumer Payment Systems: The Relationship of Attribute Structure to Preference and Usage," Journal of Business, 55 (4), 531-545
- Hogarth, J. M., Hilgert, M. A. & Kolodinsky. J. M. (2004). Consumers' Resolution of Credit Card Problems and Exit Behaviors. The Journal of Services Marketing, 18(1), 19-34.
- Hogarth, J.M., Hilgert, M. A., & Lee, J. (2001), "Problems with Credit Cards: An Exploration of Consumer Complaining Behaviors," Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior, 14, 88-107.
- Herzberg, A. (2003). Payments and banking with mobile personal devices. Communications of the ACM, 46(5), 53-58.
- Isern, J., & De Koker, L. (2009). AML/CFT: Strengthening financial inclusion and integrity.
- Jenkins, B. (2008). Developing mobile money ecosystems. Washington, DC: International Finance Corporation and Harvard Kennedy School.
- Jack, W., & Suri, T. (2011). Mobile money: The economics of M-PESA (No. w16721). National Bureau of Economic Research.

- K. Taheam, Sharma, R. and Goswami, S. (2016). Article Drivers of digital wallet usage: Implications for leveraging digital marketing, 2016https://www.researchgate.net/publication/305246579_Drivers_of_digital_wallet_usage_Implications_for_leveraging_digital_marketingMathews,
- Klein, M. U., & Mayer, C. (2011). Mobile banking and financial inclusion: The regulatory lessons. World Bank Policy Research Working Paper Series, Vol.
- Kpodar, K., & Andrianaivo, M. (2011). ICT, financial inclusion, and growth evidence from African countries (No. 11-73). International Monetary Fund.
- Kumar, D., Martin, D., & O'Neill, J. (2011, May). The times they are a-changin': mobile payments in india. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 1413-1422). ACM.
- Kulat, A., Kulkarni, R., Bhagwat, N., Desai, K., & Kulkarni, M. P. (2016). Prevention of Online Transaction Frauds Using OTP Generation Based on Dual Layer Security Mechanism.
- Kendall, J., Maurer, B., Machoka, P., & Veniard, C. (2011). An emerging platform: From money transfer system to mobile money ecosystem. *innovations*, 6(4), 49-64.
- Karmakar, K. G., Banerjee, G. D., & Mohapatra, N. P. (2011). Towards Financial Inclusion in India. SAGE Publications India.
- L. H. & Slocum, Jr., J. W (1969) Social Class and Commercial Bank Credit Card Usage *Journal of Marketing*, 33(January):71-78
- Limbu, Y. B., Huhmann, B. A., & Xu, B. (2012). Are college students at greater risk of credit card abuse? Age, gender, materialism and parental influence on consumer response to credit cards. *Journal of Financial Services Marketing*, 17(2), 148-162.

- Lowry, C. (2016). What's in Your Mobile Wallet? An Analysis of Trends in Mobile Payments and Regulation. *Fed. Comm. LJ*, 68, 353-353.
- Mas, I., & Radcliffe, D. (2010). Mobile payments go viral: M-PESA in Kenya.
- McKay, C., & Pickens, M. (2010). Branchless banking 2010: Who's served? At what price? What's next? (Vol. 66). CGAP Focus Note.
- Mas, I., & Morawczynski, O. (2009). Designing mobile money services lessons from M-PESA. *Innovations*, 4(2), 77-91.
- Mbutor, M. O., & Uba, I. A. (2013). The impact of financial inclusion on monetary policy in Nigeria. *Journal of Economics and International Finance*, 5(8), 318.
- Must, B., & Ludewig, K. (2010). Mobile money: cell phone banking in developing countries. *Policy Matters Journal*, 7(2), 27-33.
- Mann, Ronald J. (2006) " Contracting" for Credit." *Michigan Law Review* 104.5 (2006): 899-932.
- Prasad, M V N K and Swathi, P. (2012) "Towards Cashless Society", *The Indian Banker Journal*, Vol. 7, No. 2, 2012, pp. 42 – 45.
- Mathur, A. and Moschis, G. P. (1994). "Use of credit cards by older Americans." *Journal of Services Marketing* 8.1 (1994): 27-36.
- Miao, M., & Jayakar, K. (2016). Mobile payments in Japan, South Korea and China: Cross-border convergence or divergence of business models? *Telecommunications Policy*, 40(2), 182-196.
- Merritt, C. (2011). Mobile money transfers services: the next phase in the evolution of person-to-person payments. *Journal of Payments Strategy & Systems*, 5(2), 143-160.
- Medhi, I., Ratan, A., & Toyama, K. (2009). Mobile-banking adoption and usage by low-literate, low-income users in the developing world. In *International Conference on*

Internationalization, Design and Global Development (pp. 485-494). Springer Berlin Heidelberg.

Mas, I. (2009). The economics of branchless banking. *innovations*, 4(2), 57-75.

Ondrus, J., & Pigneur, Y. (2007). An assessment of NFC for future mobile payment systems. In *Management of Mobile Business, 2007. ICMB 2007. International Conference on the* (pp. 43-43). IEEE.

Porteous, D. (2009). Key issues in design and implementation of surveys on financial inclusion. In *Alliance for Financial Inclusion Global Policy Forum*. Nairobi, September (Vol. 15).

Prasad S (2016) Consumers' Perceptual Biasness in Debit Cards of Indian Banks. *J Bus Fin Aff* 5: 186. doi:10.4172/2167-0234.1000186

Pirog, S. F., & Roberts, J. A. (2007). Personality and credit card misuse among college students: The mediating role of impulsiveness. *Journal of Marketing Theory and Practice*, 15(1), 65-77.

Plummer, J. T. (1971). Lifestyle Patterns and Commercial Bank Credit Card Usage. *Journal of Marketing*, 35(April), 35-41.

Pearce, D. (2011). Financial inclusion in the Middle East and North Africa: Analysis and roadmap recommendations. *World Bank Policy Research Working Paper Series*, Vol.

Perry, T.S. (1997), "Electronic money: toward a virtual wallet," *Spectrum, IEEE* , vol.34, no.2, pp.18,19, Feb. 1997
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=570819&isnumber=12295>

Rysman, M., & Schuh, S. (2016). New innovations in payments (No. w22358). National Bureau of Economic Research.

- Roland, M.; Langer, J.; Scharinger, J., (2012) "Practical Attack Scenarios on Secure Element-Enabled Mobile Devices," Near Field Communication (NFC), 2012 4th International Workshop on, vol., no., pp.19,24, 13-13 March 2012
- Scott, R. H. (2007). Credit Card Use and Abuse: A Veblen ian Analysis. *Journal of Economic Issues*, 41(2), 567-574.
- Stephens, M. C. (2012). Promoting responsible financial inclusion: a risk-based approach to supporting mobile financial services expansion. *Banking and Finance Law Review*, 27(2), 329.
- Solin, M., & Zerzan, A. (2010). Mobile Money: Methodology for Assessing Money Laundering and Terrorist Financing Risks. The GSM Association, last modified January.
- Subbarao, D. (2009). Financial inclusion: Challenges and opportunities. Address delivered at the Bankers Club in Kolkata on December, 9.
- Shakeel Ahamad Shaik, S.K. Udgate & V.N.Sastry (2012) "A New Mobile Payment System with Formal Verification", *International Journal of Internet Technology and Secured Transactions*, Vol. 4, No. 1, pp.71–103.
- Triki, T., & Faye, I. (2013). Financial inclusion in Africa. Tunis, Tunisia: African Development Bank.
- Winn, J. K., & De Koker, L. (2013). Introduction to Mobile Money in Developing Countries: Financial Inclusion and Financial Integrity Conference Special Issue. University of Washington School of Law Research Paper, (2013-01).
- Themba, G., & Tumedi, C. B. (2012). Credit card ownership and usage behavior in Botswana. *International Journal of Business Administration*, 3(6), 60.
- Vora S and Gidwani R (1993) Plastic at a premium. *Business India* pp: 95
- Vijayasankar, B., & Krishnaveni, D. (2016). "Evolution Of Credit Cards In India—A Review." *Evolution* 2.4 (2016).