

# **Adoption and Usage of Mobile Payment Systems by Consumers and Merchants**

## **Doctoral Thesis Submitted**

**In partial fulfilment of the requirements for the award of  
the degree of**

## **DOCTOR OF PHILOSOPHY In MANAGEMENT**

**By**

**SONAL**

**ID No.15JU11400013  
Under the Supervision of**

<b>Dr.Kirti Ranjan Swain</b>	<b>Dr. Vishal Kumar</b>
<b>(Research Co-Supervisor)</b>	<b>(Research Supervisor)</b>
<b>Associate Professor</b>	<b>Assistant Professor</b>
<b>IIPM, Rourkela</b>	<b>ICFAI University</b>
<b>Odisha</b>	<b>Jharkhand, Ranchi</b>



**ICFAI UNIVERSITY JHARKHAND**

**RANCHI**

**March, 2021**

## **THESIS COMPLETION CERTIFICATE**

This is to certify that the thesis entitled “**Adoption and Usage of Mobile Payment Systems by Consumers and Merchants**” submitted by **Sonal** in partial fulfilment of the requirements for the award of Degree of Philosophy is an original work carried out by her under our joint guidance. It is certified that work has not been submitted anywhere else for the award of any other diploma or degree of this or any other university. We also certify that she complied with the plagiarism guidelines of the university.

**Dr.Kirti Ranjan Swain**  
**(Research Co-Supervisor)**  
**Associate Professor**  
**IIPM Rourkela**  
**Odisha**

**Dr.Vishal Kumar**  
**(Research Supervisor)**  
**Assistant Professor**  
**ICFAI University Jharkhand**  
**Ranchi**

## DECLARATION OF AUTHORSHIP

I declare that this research thesis entitled “**Adoption and Usage of Mobile Payment Systems by Consumers and Merchants**” submitted by me in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy by 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 acknowledge has been made in the text. I further state that I complied with the plagiarism guidelines of the University, while preparing the thesis.

Sonal  
ID No. 15JU11400013  
Address:  
Anu Kunj,  
Singhmore  
PO- Hatia  
Ranchi- 834003

Place: Ranchi

Dated: 23<sup>rd</sup> March, 2021

# PLAGIARISM CERTIFICATE

**URKUND**

## Document Information

<b>Analyzed document</b>	Final Sonal Thesis -For Plagarism.docx (D88186448)
<b>Submitted</b>	12/7/2020 12:44:00 PM
<b>Submitted by</b>	RUMNA BHATTACHARYYA
<b>Submitter email</b>	rumna.b@iujharkhand.edu.in
<b>Similarity</b>	10%
<b>Analysis address</b>	rumna.b.iujhar@analysis.orkund.com

## ACKNOWLEDGEMENT

This journey of my research work would have been impossible without the blessing of my beloved god and support and understanding of a number of people whom I would like to express my gratitude to as it was all their encouragement and help that made me complete this milestone and kept me motivated through out even after the hiccups during the process.

I am indebted to the Research Board of the ICFAI University, Jharkhand, headed by Honorable Vice-Chancellor Prof. ORS Rao and its members Dr Hari Haran and Dr. Satyendra Kishore of University that contributed in enabling a quality research by way of their suggestions in the various half-yearly progress reviews & regular reviews with their critical evaluations. I would also like to express my gratitude to Dr B M Singh for his support during the start of my PhD studies.

I would like to express my deepest gratitude to my research supervisor Dr Vishal Kumar who has been an integral part of my research journey by constantly motivating, guiding and showing the right path for my work. I would also like to extend my deepest appreciation to my research co-supervisor Dr. Kirti Ranjan Swain for his valuable insights on the topic and showing belief in my work. It was a privilege to work under such supporting, inspiring and motivating supervisor and co supervisor.

I am grateful to Dr. Barik for his assistance whenever during my research work. I would like to extend my gratitude to Dr S C Swain and Dr. Rumna Bhattacharya for their valuable advices and counseling at different stage of my research process. I am deeply obliged to Dr M Rajkumar for his assistance and enlightenment in making my research work finer. I would also like to extend my gratitude to Dr Sudipta Majumdar for his help during my PhD journey. I am thankful to Dr M. Jha and Dr. Pallavi for their support and advice in my research that helped me make my research better.

Last but not the least I pay my deepest gratitude to my family and friends for this research would not have been completed without their contribution in this journey.

Sonal

Place: Ranchi

Date: 23rd March, 2021

## **ABSTRACT**

Growth in Indian economy and evolving standard of living of Indians have welcomed room for new technologies in the lives of Indians, leading to the evolution of plethora of technology based solutions. Smartphone is one such multifarious technological solution used for connecting with people to performing financial activities, studying to gaming and shopping. Mobile payments is the recent trend which intensified lately due to collective affairs like government promoting digital India through awareness programmes, demonetization, financial inclusion through JDY, UPI launch, telecom growth with 4G launch and affordable internet facility, economical handsets, growth of m- commerce, new entrants in the m-payment industry and most importantly revamp in the lifestyle of people craving for viable solutions for everything. This is evident as the transaction of mobile payments has witnessed sustained growth in terms of volume as well as value in the last five years as per the RBI data which also indicates involvements by both merchants and consumers in the use of mobile payments system.

Whenever any new technology is introduced in the country usually advanced cities or metropolitan cities are the one to adopt it more quickly relatively to other cities and towns. So, this study takes an opportunity to study the adoption and usage of mobile payments in tier II city Ranchi comparing it with a tier I city Kolkata. Plethora of research on the mobile payment systems have been done in several countries but none have focused on comparison of actual usage level in two or more cities of same country. So, this study tries to find the level of awareness and actual usage of mobile payment systems in two varied cities of different states within the same country. In addition hardly researchers have studied merchants and consumer usage of mobile payments together, therefore this work of study focuses on dual aspects - merchants and consumers. The study also tries to find the impact of the independent variables and demographic variables on the use of mobile payment systems. Among the

other variables this study tried to find the impact of government initiatives on the use of mobile payments as the current government played an important role in creating awareness among the consumers and merchants to use and accept mobile payments and other digital payments to boost Indian economy.

To study the objectives proper research hypothesis was formulated and tested using suitable statistical analysis tools using SPSS (version 23). Different statistical tools used in this research study are - cronbach alpha, factor analysis, regression analysis, independent sample t-test, one way anova, chi-square, pie charts, tabulation and frequency.

The findings of the analysis revealed high level of awareness among merchants and consumers of both Kolkata and Ranchi city. The results revealed that there was no association between the awareness about mobile payment system and the demographic variables- city, gender and qualification whereas demographic variables, occupation, income and personal innovativeness have a significant relationship with the awareness and use of mobile payment system for consumers. The results of merchants revealed no association between the awareness about mobile payment system and the demographic variables, while association was found between city, qualification, and personal innovativeness and use of mobile payment system for merchants. Results from one-way Anova revealed that except city and gender no variables had significant impact the continued use of mobile payments for consumer. Whereas for merchant, except personal innovativeness and technology inclination no other demographic factors showed significant impact on the continued use of mobile payments. All the other variables significantly impact the continued use of mobile payments for both customer and merchants.

This research contributes to the existing research knowledge in Indian context as it provides the perspectives to why consumers and merchants are actually using or not using the mobile payments for their daiy payments.



# TABLE OF CONTENTS

## PART 1

Thesis Completion Certificate .....	ii
Declaration of Authorship .....	iii
Plagiarism Certificate .....	iv
Acknowledgement .....	v
Abstract .....	vii
Table of contents .....	ix
List of Tables .....	xvii
List of Figures .....	xxii
List of Abbreviations .....	xxiii

## PART 2

<b>CHAPTER 1: INTRODUCTION.....</b>	<b>1</b>
1.1 Overview .....	2
1.1.1 Brief History of Currency and Payment Methods.....	5
1.1.2 Mobile Payment and Mobile Payment Industry at a Glance .....	6
1.1.2.1 Mobile Payment Definition .....	6
1.1.2.2 Mobile Payment Ecosystem.....	9
1.1.2.3 Mobile Payment Process.....	13
1.1.2.4 Attributes of Mobile Payments .....	14
1.1.2.5 Mobile payment technologies, types and methods.....	14
1.1.2.5.1 Proximity payment .....	15
1.1.2.5.2 Proximity and remote payment .....	16
1.1.2.5.3 Remote payments .....	17
1.1.3 Mobile Payment Industry and Key Contributing Elements: Indian Scenario .....	18
1.1.3.1 Mobile Payment Scenario in India .....	18
1.1.3.2 Mobile Payment Players in India .....	19
1.1.4 Key Contributing Elements .....	22
1.1.4.1 Telecom Scenario .....	22
1.1.4.2 Internet Usage Scenario in India .....	23
1.1.4.3 Mobile Commerce Scenario in India.....	24
1.1.4.4 Government Initiatives .....	25
1.1.4.5 Increase in Digital Transactions .....	26
1.2 Motivation for the Study .....	28
1.3 Relevance of the Topic .....	31
1.4 Scope of the Study .....	32
1.5 Thesis Outline .....	33

1.6 Summary.....	34
<b>CHAPTER 2: REVIEW OF LITERATURE.....</b>	<b>35</b>
2.1 Overview .....	36
2.2 Literature Review of Mobile payment .....	36
2.2.1 Historical Context of Mobile Payment Systems .....	36
2.2.2 Literature review on Consumer Adoption .....	39
2.2.2.1 Consumer Adoption of M-Payment in Various Countries Determining Factors.....	41
2.2.2.2 Consumer Adoption of M-Payments' Different Technology .....	53
2.2.3 Merchant Adoption of Mobile Payment: A Literature Review .....	59
2.2.4 Literature review on Mobile Payment Research: Indian Context .....	63
2.2.5 Literature review on Review Papers of Mobile Payment Systems .....	68
2.2.6 Theories Used in Adoption Research.....	71
2.2.7 Variables Used in Mobile Payment Research.....	72
2.2.8 Findings from Previous Research Regarding Independent Variables.....	74
2.2.9 Brief Summary of Research Work.....	76
2.3 Research Gap .....	80
2.3.1 Major Research Gaps .....	80
2.3.2 Research Gaps Considered for This Research .....	81
2.4 Summary.....	81
<b>CHAPTER 3: RESEARCH METHODOLOGY .....</b>	<b>83</b>
3.1 Overview .....	84
3.2 Research Questions .....	85
3.3 Statement of the Problem .....	85
3.4 Objective of the Study .....	86
3.5 Research Hypothesis Formulation .....	87
3.5.1 Definition of Hypothesis .....	87
3.5.1.1 Hypothesis for Consumer .....	87
3.5.1.2 Hypothesis for Merchant .....	93
3.6 Research Design .....	97
3.6.1 Research Process.....	98
3.6.2 Research Approach .....	99
3.6.3 Research Method.....	100
3.7 Population.....	101
3.7.1 Sampling Design .....	101
3.7.2 Sampling Unit and Frame .....	102
3.7.3 Sampling Technique.....	102

3.7.4 Sample Size.....	103
3.8 Data Collection .....	104
3.8.1 Data Collection Method and Technique .....	104
3.8.2 Research Data Collection Instrument .....	105
3.9 Pilot Survey .....	106
3.9.1 Results from Pilot Survey .....	111
3.9.2 Final Survey Questionnaire .....	111
3.10 Summary.....	112
<b>CHAPTER 4: DATA ANALYSIS AND INTERPRETATION.....</b>	<b>113</b>
4.1 Introduction.....	114
4.2 Consumer Analysis and Interpretations .....	114
4.2.1 Demographic Profile of the Respondents .....	114
4.2.2 Comparison of Level of Awareness, Adoption and Usage of the Mobile Payment Systems among the Consumers of Ranchi and Kolkata .....	117
4.2.2.1 Awareness about the Mobile Payment Systems among Consumer.....	117
4.2.2.2 Installation of mobile payment applications by the consumer.....	119
4.2.2.3 Use of mobile payment systems by consumer .....	120
4.2.3 Non user consumer analysis .....	121
4.2.3.1 Awareness and installation of mobile payment systems by non users .....	121
4.2.3.2 Reasons for not using mobile payment systems .....	122
4.2.3.3 Reasons for abandoning mobile payment systems.....	124
4.2.3.4 Possibility of using mobile payment systems in future .....	125
4.2.4 User Consumer Analysis .....	126
4.2.4.1 Ranking of the payment options preferred by the consumers.....	126
4.2.4.2 Span of using the mobile payment system by consumers .....	127
4.2.4.3 Frequency of using the mobile payment system .....	128
4.2.4.4 Expenditure made through mobile payment systems .....	130
4.2.4.5 Loading of balance in consumers mobile wallet.....	131
4.2.4.6 Mobile payment applications installed by consumer .....	133
4.2.4.7 Purposes for which mobile payment system is used .....	134
4.2.4.8 Feel it is risky to use mobile payment systems .....	136
4.2.4.9 Feeling that merchant may misuse the financial data while using mobile payment systems .....	137
4.2.4.10 Experience of merchant discouragement .....	138
4.2.4.11 Perception about mobile payment in their city .....	139
4.2.4.12 Problems faced by while using mobile payment systems.....	140

4.2.5 Results of Factor Analysis .....	141
4.2.5.1 KMO Bartlett's test results .....	142
4.2.5.2 Exploratory Factor Analysis .....	142
4.2.5.3 Reliability Analysis .....	145
4.2.6 Hypothesis testing for finding association between demographic variables and awareness about the mobile payment systems .....	147
4.2.6.1 Association between City and Awareness about Mobile Payment Systems .....	147
4.2.6.2 Association between Gender and Awareness about Mobile Payment Systems .....	149
4.2.6.3 Association between Age and Awareness about Mobile Payment Systems .....	152
4.2.6.4 Association between Educational Qualification and Awareness about Mobile Payment Systems.....	155
4.2.6.5 Association between Occupation and Awareness about Mobile Payment Systems .....	158
4.2.6.6 Association between Income and Awareness about Mobile Payment Systems .....	163
4.2.6.7 Association between Personal Innovativeness and Awareness about Mobile Payment Systems.....	166
4.2.7 Hypothesis testing for finding association between demographic variables and use of the mobile payment systems .....	170
4.2.7.1 Association between City and Use of Mobile Payment Systems .....	170
4.2.7.2 Association between Gender and Use of Mobile Payment Systems.....	172
4.2.7.3 Association between Age and Use of Mobile Payment Systems.....	175
4.2.7.4 Association between Educational Qualification and Use of Mobile Payment Systems .....	178
4.2.7.5 Association between Occupation and Use of Mobile Payment Systems.....	182
4.2.7.6 Association between Income and Use of Mobile Payment Systems.....	187
4.2.7.7 Association between Personal innovativeness and Use of Mobile Payment Systems .....	191
4.2.7.8 Association between Awareness and Use of Mobile Payment Systems.....	195
4.2.8 Hypothesis testing for demographic factors affecting continued use of the mobile payment systems .....	196
4.2.8.1 Impact of City on Continued use of Mobile Payment Systems .....	196
4.2.8.2 Impact of Gender on Continued use of Mobile Payment Systems.....	197
4.2.8.3 Impact of Age on Continued use of Mobile Payment Systems .....	199

4.2.8.4 Impact of Educational qualification on Continued use of Mobile Payment Systems .....	200
4.2.8.5 Impact of Occupation on Continued use of Mobile Payment Systems.....	202
4.2.8.6 Impact of Income on Continued use of Mobile Payment Systems.....	203
4.2.8.7 Impact of Personal innovativeness on Continued use of Mobile Payment Systems .....	205
4.2.9 Hypothesis testing for finding the impact of the other factors on the continued use of the mobile payment systems through regression.....	207
4.3 Merchant Analysis .....	210
4.3.1 Demographic profile of the respondents .....	210
4.3.1.1 Business profile .....	213
4.3.2 Comparison of level of awareness, adoption and usage pattern among merchants of Ranchi and Kolkata city.....	214
4.3.2.1 Awareness about mobile payment system among merchants.....	214
4.3.2.2 Use of mobile payment by the merchants.....	216
4.3.3 Non user merchant analysis .....	218
4.3.3.1 Awareness and installation among non user.....	218
4.3.3.2 Reason for not using Mobile Payment Systems.....	219
4.3.3.3 Consumer's demand when Mobile Payments Systems is not accepted by the Merchant.....	220
4.3.3.4 Reason for abandoning Mobile Payment Systems .....	221
4.3.4 User Merchant Analysis .....	222
4.3.4.1 Preference in payment option accepted by merchants.....	222
4.3.4.2 Mobile payment application installed by merchants .....	223
4.3.4.3 Purposes for which mobile payment system is used by merchants.....	225
4.3.4.4 Feeling of risk while using mobile payment systems.....	226
4.3.4.5 Encouragement by merchants for using mobile payment systems .....	227
4.3.4.6 Mobile payment scenario in both the cities .....	228
4.3.5 Problems faced by merchants while operating mobile payment systems .....	229
4.3.6 Results of Factor analysis .....	230
4.3.6.1 KMO Bartlett's test results .....	231
4.3.6.2 Exploratory Factor Analysis .....	231
4.3.7 Reliability Analysis .....	234

4.3.8 Hypothesis testing for finding association between demographic variables and awareness about mobile payment systems among merchant .....	236
4.3.8.1 Association between City and Awareness about Mobile Payment Systems .....	236
4.3.8.2 Association between Gender and Awareness about Mobile Payment Systems .....	239
4.3.8.3 Association between Age and Awareness about Mobile Payment Systems .....	241
4.3.8.4 Association between Educational qualification and Awareness about Mobile Payment Systems.....	244
4.3.8.5 Association between Personal innovativeness and Awareness about Mobile Payment Systems.....	248
4.3.8.6 Association between Technology inclination and Awareness about Mobile Payment Systems.....	252
4.3.9 Hypothesis testing for finding association between demographic variables and acceptance of the mobile payment systems by merchant .....	255
4.3.9.1 Association between City and Acceptance of Mobile Payment Systems.....	255
4.3.9.2 Association between Gender and Acceptance of Mobile Payment Systems .....	257
4.3.9.3 Association between Age and Acceptance of Mobile Payment Systems.....	260
4.3.9.4 Association between Educational qualification and Acceptance of Mobile Payment Systems .....	265
4.3.9.5 Association between Personal innovativeness and Acceptance of Mobile Payment Systems.....	270
4.3.9.6 Association between Technology inclination and Acceptance of Mobile Payment Systems .....	275
4.3.9.7 Association between Awareness and Acceptance of Mobile Payment Systems .....	278
4.3.10 Hypothesis testing for finding the impact of the demographic factors on the continued use of the mobile payment systems .....	278
4.3.10.1 Impact of City on Continued use of Mobile payment systems .....	278
4.3.10.2 Impact of Gender on Continued use of Mobile payment systems .....	280
4.3.10.3 Impact of Age on Continued use of Mobile payment systems .....	281
4.3.10.4 Impact of Educational qualification on Continued use of Mobile payment systems .....	283
4.3.10.5 Impact of Personal innovativeness on Continued use of Mobile payment systems.....	284
4.3.10.6 Impact of Technology inclination on Continued use of Mobile payment systems .....	286

4.3.10.7 Hypothesis testing for finding the impact of other factors on the continued use of the mobile payment systems.....	288
4.4 Summary.....	291
<b>CHAPTER 5: RESULT, DISCUSSIONS &amp; CONCLUSIONS .....</b>	<b>292</b>
5.1 Introduction.....	293
5.2 Results & Discussions .....	293
5.2.1 Results from objective one .....	294
5.2.2 Results from objective two .....	296
5.2.2.1 Chi-square for consumers .....	296
5.2.2.2 Chi-square for merchants.....	298
5.2.2.3 Results from independent sample T-test and ANOVA for consumers .....	299
5.2.2.4 Results from independent sample T-test and ANOVA for merchants .....	301
5.2.3 Results from objective three .....	302
5.2.4 Results from objective four.....	303
5.2.5 Reasons of the non users for not using mobile payment system .....	304
5.2.6 Summary of Findings and Comparison of result with the previous research findings .....	305
5.2.6.1 Summary of findings for Consumers and Merchants.....	305
5.2.6.2 Comparison of result with the previous literature findings .....	306
5.3 Managerial Implications and Suggestions .....	307
5.3.1 Implications for the Service Providers .....	309
5.3.2 Implications for Government, Regulatory bodies and Policy makers .....	310
5.3.3 Implications for Merchants.....	310
5.3.4 Implications for Academic Institution.....	310
5.3.5 Implications for Researchers.....	311
5.4 Limitations & Future Scope.....	313
5.4.1 Limitations of the research .....	313
5.4.2 Future Recommendations .....	314
5.5 Conclusion .....	315
<b>BIBLIOGRAPHY .....</b>	<b>319</b>
<b>APPENDICES.....</b>	<b>363</b>
Questionnaire for Consumers .....	370
Questionnaire for Merchants .....	375
<b>PUBLICATION AND PRESENTATION.....</b>	<b>379</b>

List of Publication.....	379
List of Presentation in Conferences and Seminars .....	379



## **PART 3**

### **List of Tables**

Table 1.1: Expectations of ecosystem players .....	12
Table 1.2: Major mobile payments players in India .....	20
Table 1.3: Telecom sector subscriber base distribution .....	23
Table 1.4: Value and volume of digital payments .....	26
Table 2.1: Brief summary of research work .....	76
Table 3.1: Data collection from area of Ranchi and Kolkata .....	102
Table 3.2: Questionnaire of consumer pilot survey .....	107
Table 3.3: Questionnaire of merchant pilot survey .....	108
Table 3.4: Cronbach's value for consumers' pilot survey .....	111
Table 3.5: Cronbach's value for merchants' pilot survey .....	111
Table 4.1: Demographic profile of consumers .....	114
Table 4.2: Awareness among consumers about mobile payment .....	117
Table 4.3: Installation of mobile payment applications by consumer .....	119
Table 4.4: Use of mobile payment systems by consumer .....	120
Table 4.5: Awareness and installation of mobile payment systems by non users .....	121
Table 4.6: Reasons for not using mobile payment .....	122
Table 4.7: Reasons for not abandoning mobile payment .....	124
Table 4.8: Possibility of using mobile payment systems .....	125
Table 4.9: Ranking of payment options among consumers .....	126
Table 4.10: Span of using the mobile payment systems .....	127
Table 4.11: Frequency of using the mobile payment system .....	129
Table 4.12: Expenditure made through mobile payment systems by consumers .....	130
Table 4.13: Money balance loaded in mobile payment wallet by consumers .....	132
Table 4.14: Mobile payment application installed by consumers .....	133
Table 4.15: Purpose for which mobile payment system is used by consumers .....	135
Table 4.16: Feeling of risk while using mobile payment by consumers .....	136
Table 4.17: Feeling of misuse of their credentials by merchants while using mobile payment system .....	137
Table 4.18: Experience of merchant discouragement .....	138
Table 4.19: Problems faced while use of mobile payment by consumers .....	140
Table 4.20: KMO Bartlett's test of consumers .....	141
Table 4.21: Total variance test of consumers .....	142
Table 4.22: Rotated component matrix of consumers .....	143
Table 4.23: Cronbach's alpha value of consumer respondents .....	145

Table 4.24: Cross tabulation city's influence on awareness about mobile payment systems .....	147
Table 4.25: Chi-square test for city's influence on awareness .....	148
Table 4.26: Cross tabulation for gender's influence on awareness .....	149
Table 4.27: Chi-square test for gender's influence on awareness .....	151
Table 4.28: Cross tabulation for age's influence on awareness .....	152
Table 4.29: Chi-square test for age's influence on awareness .....	154
Table 4.30: Cross tabulation for qualification's influence on awareness .....	155
Table 4.31: Chi-square test for qualification's influence on awareness .....	157
Table 4.32: Cross tabulation for occupation's influence on awareness .....	158
Table 4.33: Cross tabulation for occupation's influence on awareness .....	162
Table 4.34: Cross tabulation for income's influence on awareness .....	163
Table 4.35: Chi-square test for income's influence on awareness .....	165
Table 4.36: Cross tabulation personal innovation's influence on awareness.....	166
Table 4.37: Chi-square test for personal innovation's influence on awareness.....	169
Table 4.38: Cross tabulation for use and city .....	170
Table 4.39: Chi-square test for use and city .....	171
Table 4.40: Cross tabulation for use and gender .....	172
Table 4.41: Chi-square test for use and gender .....	174
Table 4.42: Cross tabulation for use and age .....	175
Table 4.43: Chi-square test for use and age .....	177
Table 4.44: Cross tabulation for use and educational qualification.....	178
Table 4.45: Chi-square test for use and education.....	181
Table 4.46: Cross tabulation for use and occupation.....	182
Table 4.47: Chi-square test for use and occupation.....	186
Table 4.48: Cross tabulation for use and monthly income.....	187
Table 4.49: Chi-square test for use and monthly income.....	190
Table 4.50: Cross tabulation for use and personal innovativeness .....	191
Table 4.51: Chi-square test for use and personal innovativeness.....	194
Table 4.52: Chi-square test for awareness and use .....	195
Table 4.53: Group Statistics of consumers' city.....	196
Table 4.54: T-test analysis for consumer respondents' city.....	197
Table 4.55: Group Statistics of consumers' gender .....	198
Table 4.56: T-test analysis for consumer respondents' gender .....	198
Table 4.57: Group Statistics of consumers' age .....	199
Table 4.58: Test of Homogeneity of Variances.....	199
Table 4.59: One way ANOVA analysis for consumer respondents' age.....	200
Table 4.60: Descriptive of consumers' educational qualification .....	201
Table 4.61: Test of Homogeneity of Variances.....	201
Table 4.62: One way ANOVA analysis for consumer respondents' educational qualification .....	201
Table 4.63: Group Statistics of consumers' occupation.....	202
Table 4.64: Test of Homogeneity of Variances.....	203

Table 4.65: One way ANOVA analysis for consumer respondents' occupation.....	203
Table 4.66: Group Statistics of consumers' income .....	204
Table 4.67: Test of Homogeneity of Variances .....	204
Table 4.68: One way ANOVA analysis for consumer respondents' income. ....	204
Table 4.69: Group Statistics of consumers' personal innovativeness.....	205
Table 4.70: Test of Homogeneity of Variances .....	206
Table 4.71: One way ANOVA analysis for consumer respondents' personal innovation .....	206
Table 4.72: Correlation of all independent and dependent variables.....	208
Table 4.73: Model summary.....	209
Table 4.74: ANOVA test.....	209
Table 4.75: Coefficients .....	210
Table 4.76: Demographic profile of merchants .....	210
Table 4.77: Business profile of merchants .....	213
Table 4.78: Awareness among consumers about mobile payment.....	214
Table 4.79: Installation of mobile payment applications by merchants .....	215
Table 4.80: Use of mobile payment systems by consumer .....	216
Table 4.81: Awareness and installation among by non user .....	217
Table 4.82: Reason for not using mobile payment system.....	219
Table 4.83: Consumer demand when Mobile Payments Systems is not accepted.....	220
Table 4.84: Reason for abandoning mobile payment system.....	221
Table 4.85: Payment preference by merchants.....	222
Table 4.86: Payment application installed by merchants.....	223
Table 4.87: Purpose of use of mobile payment by merchants.....	225
Table 4.88: Risk feeling in use of mobile payment by merchants.....	226
Table 4.89: Encouragement to customers for use of mobile payment.....	227
Table 4.90: Problems in use of mobile payment by merchants.....	229
Table 4.91: KMO Bartlett's test of merchants .....	231
Table 4.92: Total variance test of merchants.....	231
Table 4.93: Rotated component matrix of merchants .....	233
Table 4.94: Cronbach's alpha value of merchant responses .....	234
Table 4.95: Cross tabulation for awareness and city .....	236
Table 4.96: Chi square test for awareness and city.....	238
Table 4.97: Cross tabulation for awareness and gender.....	239
Table 4.98: Chi square test for awareness and gender.....	240
Table 4.99: Group statistics of merchants' age .....	241
Table 4.100: Cross tabulation for awareness and age.....	241
Table 4.101: Chi square test for awareness and age .....	243
Table 4.102: Group statistics of merchants' educational qualification.....	244
Table 4.103: Cross tabulation for awareness and qualification.....	244
Table 4.104: Chi square test for awareness and educational qualification.....	247
Table 4.105: Group statistics of merchants' personal innovativeness .....	248

Table 4.106: Cross tabulation awareness and personal innovativeness .....	248
Table 4.107: Chi square test for awareness and personal innovativeness.....	251
Table 4.108: Independent sample test for technology inclination .....	252
Table 4.109: Cross tabulation awareness and technology inclination .....	252
Table 4.110: Chi square test for awareness and technology inclination .....	254
Table 4.111: Cross tabulation of use and age .....	255
Table 4.112: Chi square test for use and city .....	256
Table 4.113: Cross tabulation of use and gender .....	257
Table 4.114: Chi square test for use and gender.....	259
Table 4.115: Cross tabulation of use and age .....	260
Table 4.116: Chi square test for use and age .....	264
Table 4.117: Cross tabulation use and education qualification .....	265
Table 4.118: Chi square test for use and educational qualification .....	269
Table 4.119: Cross tabulation use and personal innovativeness .....	270
Table 4.120: Chi square test for use and personal innovativeness .....	274
Table 4.121: Cross tabulation use and technology inclination.....	275
Table 4.122: Chi square test for use and technology inclination.....	277
Table 4.123: Cross tabulation awareness and acceptance.....	278
Table 4.124: Group statistics for merchants' city.....	279
Table 4.125: T test for merchants' continued use with city .....	279
Table 4.126: Group statistics for merchants' gender .....	280
Table 4.127: T test for merchants' continued use with gender .....	280
Table 4.128: Group statistics for merchants' age .....	281
Table 4.129: Test of Homogeneity of Variances .....	282
Table 4.130: One way ANOVA test for use and age.....	282
Table 4.131: Group statistics for merchants' educational qualification .....	283
Table 4.132: Test of Homogeneity of Variances .....	283
Table 4.133: One way ANOVA test for use and educational qualification.....	284
Table 4.134: Group statistics for merchants' personal innovativeness.....	285
Table 4.135: Test of Homogeneity of Variances .....	285
Table 4.136: One way ANOVA test for use and personal innovativeness.....	285
Table 4.137: Group statistics for merchants' technology inclination .....	286
Table 4.138: Test of Homogeneity of Variances .....	287
Table 4.139: One way ANOVA test for use and technology inclination.....	287
Table 4.140: Correlation of all independent and dependent variables.....	288
Table 4.141: Model summary.....	289
Table 4.142: ANOVA test.....	289
Table 4.143: Regression coefficients .....	290
Table 5.1: Chi square table for consumer awareness and consumer use .....	296
Table 5.2: Chi square table for merchant awareness and merchant use .....	298
Table 5.3: Demographic factors affecting continued use of mobile payment by consumers .....	299

Table 5.4: Demographic factors affecting continued use of mobile payment by merchants .....	301
Table 5.5: Linear Regression of Consumers .....	302
Table 5.6: Linear Regression of Merchants .....	303
Table 5.7: Summary of findings .....	305
Table 5.8: Summary of findings .....	305
Table 5.9: Result comparison with previous literature findings for consumers .....	306
Table 5.10: Result comparison with previous literature findings for consumers .....	307

## List of Figures

Figure 1.1: History of money .....	5
Figure 1.2: Major mobile payment ecosystem players .....	9
Figure 1.3: Mobile payment process.....	13
Figure 1.4: Mobile payment types .....	15
Figure 3.1: Flow chart of research process .....	97
Figure 3.2: Flow chart of sampling design.....	100
Figure 4.1: Awareness among consumers about the mobile payment systems .....	118
Figure 4.2: Installation of mobile payment application by consumers .....	119
Figure 4.3: Use of mobile payment systems by consumer.....	120
Figure 4.4: Awareness and installation by non users.....	121
Figure 4.5: Reason for not using mobile payment systems by consumer .....	123
Figure 4.6: Reason for abandoning mobile payment systems by consumer .....	124
Figure 4.7: Possibility of using mobile payment by consumer .....	125
Figure 4.7: Possibility of using mobile payment by consumer .....	125
Figure 4.8: Span of using mobile payment systems .....	128
Figure 4.9: Frequency of using mobile payment by consumers.....	129
Figure 4.10: Expenditure made through mobile payment systems by consumer .....	131
Figure 4.11: Money balance in mobile payment wallet by consumer .....	132
Figure 4.12: Applications installed for mobile payment by consumers .....	134
Figure 4.13: Purpose which mobile payment system is used by consumers.....	135
Figure 4.14: Feeling of risk while using mobile payment by consumers .....	136
Figure 4.15: Feeling of misuse of their credentials by merchants while using mobile payment system.....	137
Figure 4.16: Experience of merchant discouragement.....	138
Figure 4.17: Perception about mobile payment in their city .....	139
Figure 4.18: Problems faced in using mobile payment by consumers.....	140
Figure 4.19: Awareness about mobile payment among merchants .....	214
Figure 4.20: Installation of mobile payment applications.....	215
Figure 4.21: Usage of mobile payment by merchants .....	216
Figure 4.22: Awareness and installation among non user.....	217
Figure 4.23: Reason for not using mobile payment by merchants .....	219
Figure 4.24: Consumer's demand when mobile payment not accepted .....	220
Figure 4.25: Reason for abandoning mobile payment .....	221
Figure 4.26: Payment application installed by merchants.....	223
Figure 4.27: Purpose of use of mobile payment by merchants .....	225
Figure 4.28: Risk feeling in use of mobile payment by merchants .....	226
Figure 4.29: Encouragement for use of mobile payment by merchants .....	227
Figure 4.30: Mobile payment scenario in Ranchi and Kolkata .....	228
Figure 4.31: Problems faced in use of use of mobile payment by merchants.....	229

## **List of Abbreviations**

AD- After Death

AEPS- Aadhar Enabled Payment System

BC- Before Christ

DG- Director General

GDP- Gross Domestic Product

GST- Goods and Service tax

IMPS- Interbank Mobile Payment System

MDR- Merchant Discount Rate

MMID- Mobile Money Identifier

MNOs- Mobile Network Operators

MNSPs- Mobile Network Service Providers

MP- Mobile payment

MPS- Mobile payment System

MPIN- Mobile banking Personal Identification number

NFC- Near Field Communication

NPCI- National Payments Corporation of India

PoS- Point of Sale

QR- Quick Response

RFID- Radio Frequency Identification

SMEs- Small & Medium Enterprises

SMS- Short Message Service

UPI- Unified Payment Interface

USSD- Unstructured Supplementary Service Data

# **CHAPTER 1:**

# **INTRODUCTION**



# CHAPTER 1: INTRODUCTION

## 1.1 Overview

Smartphone, with its manifold tasking ability and portability has become the way of life (Falke et al., 2007), providing convenience, independence and flexibility (Sarwar & Soomro., 2013), mobility, quick access (Leung & Wei, 2000), and ubiquity (Karnouskos, 2004), to the users enhancing productivity in all spheres of their life. Technology has revolutionized the value of smartphone in people's life by performing day to day activities like booking tickets, studying, socializing, gaming, entertainment, shopping, banking finances, bill payments (Aydin & Burnaz, 2016), person-to-person transfer, account transfer, mobile marketing and other kinds of payments (Oliveira et al., 2016). This multi-functionality of smartphone has revolutionized the retail industry (Shanker et al. 2010) as consumers are willing to shop through their smartphone (Cliquet et al., 2014). According to a survey by Economic Times (2019), Indians spend one-third of their waking time on internet using their smartphones. Indian smartphone market is growing exponentially as a result of one of the largest youth population in the world (Wani & Ali, 2015). This potential of smartphone combined with high speed internet facility has revamped the market scenario (Mallat, 2007; CII, 2016; Shaw, 2018) driving the marketers of all class to focus on providing all kinds of goods and services through mobile. Today there is an app for anything one could think of. This concurrence of internet with mobile communication, the two fastest growing industries of this era has led to the creation of an emerging market for mobile commerce (Islam et al., 2011) and mobile app has become efficacious (Karnouskos, 2004) thus every businessman, big or small today are developing mobile based solutions (Singh & Islam, 2016). The ever increasing number of mobile phone users, as well as the fast paced evolution of mobile

technologies has resulted in online shopping and online banking (Shin et al, 2014; Satinder & Niharika, 2015), creating space for mobile payment systems in the e-commerce industry (Au & Kauffman, 2008; Kumar et al., 2012; Wasiq et al., 2016). As any m-commerce activity needs an efficient payment settlement through mobile phone (Phonthanukitithaworn et al., 2016), therefore mobile payment is gaining popularity globally in the area of m-commerce (Carr, 2007).

With two third rural population and 25% of illiterate population in India financial inclusion is a tough task. Even after government initiatives of JAM Trinity (Jan Dhan, AADHAR & Mobile) where JDY witnessed a massive success with an opening of 25.68 crore bank account, still 190 million adult are unbanked lacking financial access in India. There is low penetration of banks in rural areas as it has only 6.2 branches per 100,000 people in India, whereas it is 14.2 branches per 100,000 in urban area (Grant Thornton, 2020). M-payment is viewed as branchless banking (Ivatury & Mas, 2008). Brick mortar bank opening in rural areas is a costly affair for banks, as cost of establishing bank for lower socio-economic group will not give high returns to the bank. According to Quartz India 2018, with 48% of inactive bank accounts (which had no transaction in a year), India has largest number of inactive accounts in the world. But according to the same report 66% of inactive users have a mobile phone which could be used as an efficient mode for banking channels. As a mobile phone can be used as a mode of banking, financial inclusion can be achieved if power of mobile technology is utilized in the right way. Kenya's M-pesa launched by Safaricom is a well known example where technology played a great role in enhancing financial inclusion (Arun and Kamath, 2015) and today about 90% of youth has M-Pesa account in Kenya. Digital financial inclusion will act as boon for economic boost (Ozili, 2017). Mobile payment being a next level e-payment solution (Mallat, 2007; Carr, 2007, Islam et al., 2011) has revolutionized financial services (Ouma et al., 2017). Mobile payment being easily and cheaply (Cracknell, 2004) reaching

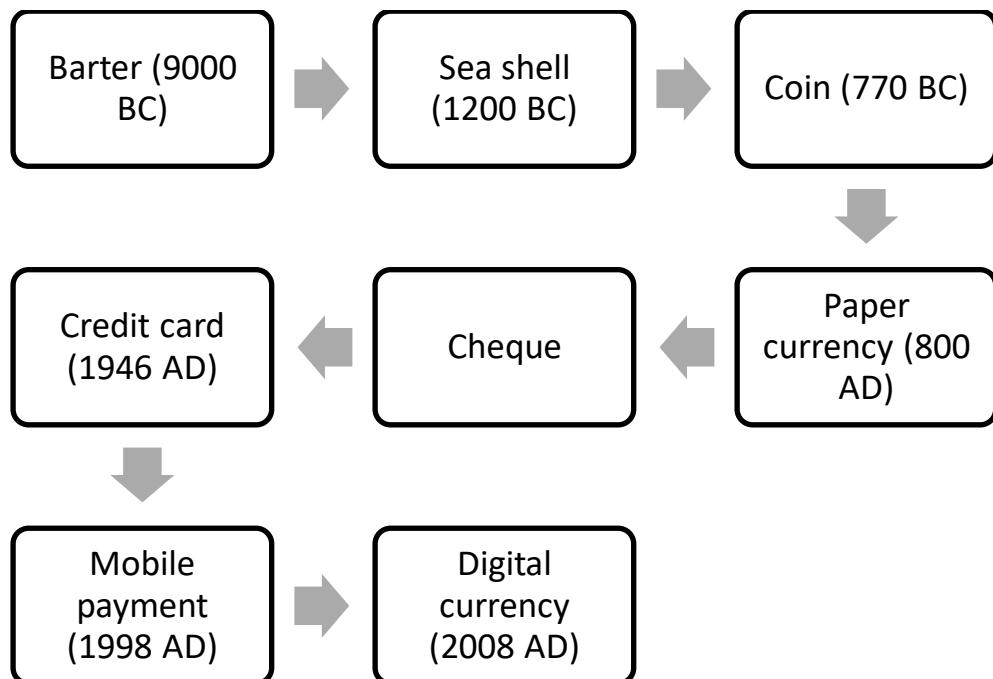
out to the financially deprived can act as a bridge between the financially deprived population and financial services (Resendiz, 2017) in a developing country (like India) where people owning mobile phone supersedes the bank account holders (Porteous, 2006), to access financial services such as money transfer (DBT), making deposit, making payments for services and utilities, withdrawing money.

Mobile payment is visioned to have a bright future (Au & Kauffman, 2008; Bezhovski, 2016), as it is considered a killer app by many (Hu et al., 2008; Ondrus et al., 2009). Many authors found that mobile payment provides definite value to consumers and merchants (Lai & Chuah, 2010). Mobile payment through its freedom from cash (Karnouskus & Fokus, 2004), convenience and ubiquity (Chen & Nath, 2008; Mallat, 2007; Liebana Cabanilas et al., 2017), is gaining global popularity (Chen & Nath, 2008). The awareness about abilities of mobile payment services in providing economic benefits to the society at much lower than cash and card based solutions, is wide spreading (Arvidsson, 2014) making m- payment as a convenient life style (Teng et al., 2018). The ability of implementing services to merchant and consumer at the same time has made mobile payment more convenient (Tartiana et al., 2016). Mobile payment is not mere mobilization of e-payment (Karnouskus & Fokus, 2004) it also plays a significant role in the growth of m- commerce (Yang et al., 2012), as it is heavily dependent on the acceptance of mobile payment by consumers (Yang et al., 2015). Mobile payment provides consumer with all time financial access (Mallat, 2006) through which people can pay for anything for e.g. transportation tickets or car parking (Begonha et al., 2002), electronic billing, digital content such as ring tones, logos, news, music, or games (Dahlberg et al., 2007), checking bank balances (Tiwari et al., 2007), shopping, services, fund transfer, investment and much more (Kim et al., 2010; Singh et al., 2017). Merchant is benefitted with acceptance of m-payment as it increases transaction speed and open new possibilities for better implementation of business strategies through m-

commerce (Liébana Cabanillas et al., 2016). Despite much advantage of mobile payment for both consumer and merchant (Dahlberg et al., 2015), adoption rate is yet unsatisfactory (Mallat, 2006; Pousttchi et al., 2009), thus widespread adoption of mobile payments is yet to occur (Zhou, 2014).

### 1.1.1 Brief History of Currency and Payment Methods

**Figure 1.1 History of evolution of means of payment (Source: Luna, 2017)**



The concept of money arose with the dawn of human civilization. It was basically a medium of trade of goods between two individuals. The concept of what can be considered as money has changed from time to time from livestock, shells, coins, notes to now cryptocurrency. Barter system was the stepping stone in the trade of goods which came into existence around 9000 BC. In this system, one could exchange goods among themselves with no standard technique e.g.- A person can exchange an axe with a goat. Times changed and then a standard item was considered as a base for purchasing

goods. These were generally valuables found naturally like shells, special types of stones etc. which varied from region to region. Around 700 BC, with the development of metallurgy, precious metals such as gold and silver were declared as money by kingdoms. Gradually kingdoms shifted towards cheaper metals such as copper and other alloys such as bronze. Coins made of such materials were much cost-effective to fabricate and were given the status of value marked on it. Chinese with invention of paper around 700 A.D. have revolutionized the system of money. Soon, the paper printed with its value and other specific information was considered as money. It was way easier to carry than coins and much easier to print than complex metallurgical processes of fabricating coins. Paper notes then became popular all over the world which is still in practice. Another paper based cheque system was launched by a British banker in 1762 AD. This was issued by bank and was distributed among consumers, and with valid number and signature, the cheque could be encashed. With the launch of credit card by a bank in Brooklyn in the year 1946, plastic money came into existence. This plastic money also changed the way payments were made as wallets started becoming cashless, and a new sense of comfort of not carrying cash was being liked by masses. Coca Cola in the year 1997, introduced the system of mobile payment to the world, in which the vending machines were enabled to accept payments by sending SMS from any mobile phone. Gradually mobile wallets came into existences that are basically software applications loaded on mobile phone for making payments. Many banks and other third party companies have launched. Mobile wallet has now evolved with many other NFC and UPI technologies. Cryptocurrencies have also attained the status of money in recent year

### **1.1.2 Mobile Payment and Mobile Payment Industry at a Glance**

#### **1.1.2.1 Mobile Payment Definition**

Mobile payment is defined as any payment made through mobile handset (Krueger, 2001). Van der Heijden (2002) referred mobile payment as a

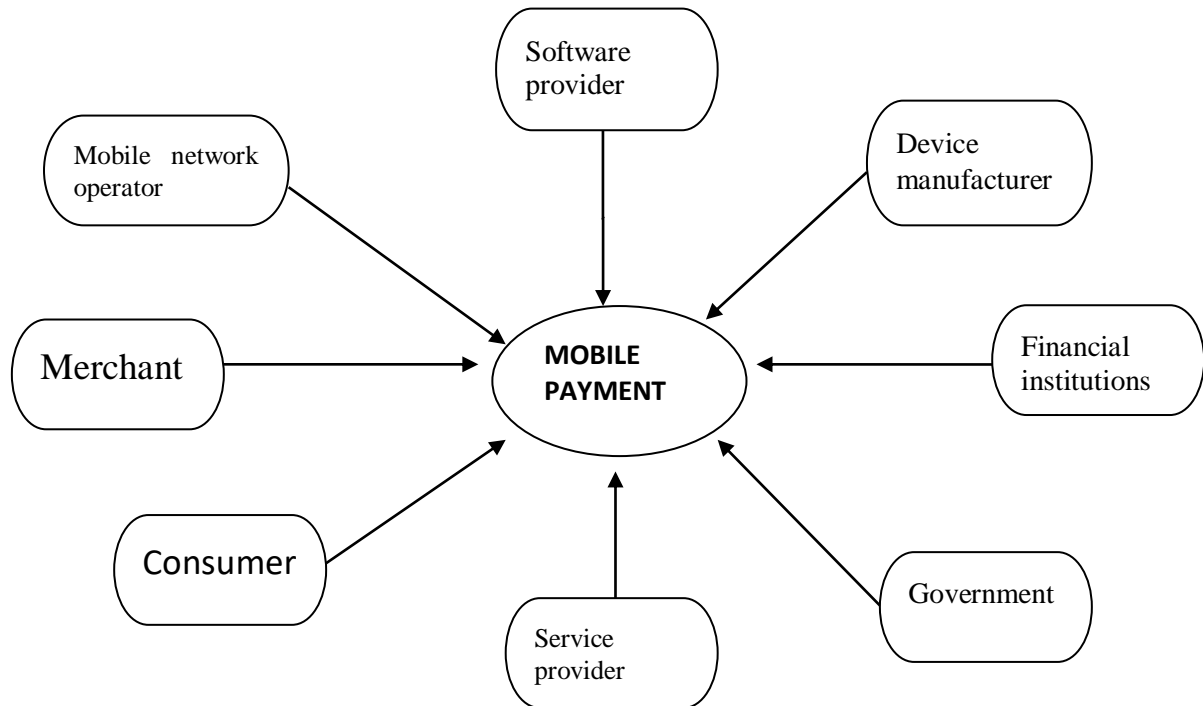
conventional or new payment securely made by use of mobile network system from peer to peer or business to peer. Karnouskos and Fokus (2004) have referred mobile payment as a killer solution not just only for e-payments, but also to intensify e-commerce and m-commerce. They defined m-payment as any type of payment which requires a mobile device to begin, activate and/or approve that payment. Pousttchi (2003) recognized mobile payment as pivotal, and suggested wide acceptance of mobile payment by merchants and consumers not keeping it limited to mobile commerce. Turowski and Pousttchi (2004) defined mobile payment an electronic payment transaction procedure where mobile communication technique is employed by the player in coexistence with mobile device for the completion of payment through initiation, authorization or realization of payment. Zhong (2009) supports the definition of (Karnouskos and Fokus, 2004; Turowski and Pousttchi, 2004) discovering mobile payment as a new payment alternative to traditional payment by confirmation. De Bel and Gâza (2011) also suggested initiation and confirmation in mobile payment transaction, but did not include authorization in their definition. Diniz et al. (2011) summarized mobile payment as digital payment via mobile handheld devices which may or may not use telecom network, and the inclusion of financial institutions and banks being not mandatory. Ondrus and Pigneur (2006) defined mobile payment as any wireless transaction made between two parties by use of any mobile device. Further they stated the physical appearance of the mobile device can vary and should be capable of securely processing the payment. Dahlberg et al (2007) & Ghezzi et al. (2010) in addition to the definition of Ondrus and Pigneur (2006) stated that other communication technologies (NFC, Bluetooth, RFID etc) than wireless network can also be used for making payment for goods, services, bills through mobile phone, smartphone or any personal digital assistant (PDA). Further Dahlberg et al (2015) extended definition of mobile payment as “type of virtual payment enabled by mobile device, in which money is transferred remotely or near-by from a payer to receiver via an intermediary or directly in exchange for a service, a product or as a money

transfer”. As per Au Kaufmann (2007), “mobile payment (m-payment) is a point-of-sale (PoS) transaction made or received with a mobile device”. For merchants m-payment is mobile phone based payment providing a new alternative of transaction with their consumers (Lai & Chuah, 2010). Various other authors too have defined m-payment such as Tobbin & Kuwornu (2011), Shin (2010), The European Commission Green Paper (2012), Luna (2017), Dewan & Chen (2005) etc.

Mobile payment can be used for payment for peer-to-business in wide areas like payment for ticketing, bill payment of phone and other utilities, payment for digital services (games, subscription, games, ringtones etc), payment at PoS, vending machines and many other possible points (Mallat, 2006). Peer-to-peer payment is also possible in which money can be transferred from one person’s digital wallet to another’s. Just as any other technology, mobile payments too have their own advantages and disadvantages. Mobile payment gives easy accessibility of anytime anywhere payment (Begonha et al., 2002) for various payment platforms, gives feel of security being cashless, and extra perks of cashbacks and offers. Major disadvantage being the money is stuck in phone, if battery dies or network is poor payment cannot be done. Other problems being complexity of procedure, lack of merchant acceptance and issues of risk and security (Mallat, 2006). From merchants’ perspective mobile payments help them increase as consumer tend to spend more by cashless modes, increase in consumer loyalty, and faster transaction time helps them to attend more consumers (Smart Card Alliance, 2007). Major drawbacks being some consumers feel mobile payment as troublesome process, cost incurred by merchants on initial equipment setup and fraud practices (Hayashi & Bradford, 2014).

### 1.1.2.2 Mobile Payment Ecosystem

**Figure 1.2: Major mobile payment ecosystem players (source: Karnouskos & Fokus, 2004; Dennehy & Sammon, 2015)**



Mobile payment ecosystem consists of

1. Consumer – The person who initiates, activates and confirms payment through mobile device. The consumer is the payer, the party who makes the payment (Karnouskos & Fokus, 2004). Consumers are the end user which owns a mobile phone. It is the consumer who should be convinced that mobile payment has an edge over all other payment options. The key to mobile payment acceptance lies in the hands of consumers(Pousttchi,2003).
2. Merchant i.e. stores and web portals –The physical store or web portals from where goods and services are purchased through mobile payments are termed as merchants. The merchant is the player who accepts the payment and known as payee (Karnouskos & Fokus, 2004).



The work of merchant (usually any real/virtual POS) in the ecosystem is providing the consumer with the necessary transaction details, invoices (Karnouskos & Vilmos). The merchant has to get enrolled in the mobile payment service provider merchants list. When the merchant accepts the payment from the consumer, the payment is processed through a channel, and digital money gets deposited in either his bank account or digital wallet (Raina, 2014).

3. Financial institutions (banks, credit card companies & payment processor) –They create and offer banking services for mobile payment transaction (Luna, 2017). It acts as the acquirer that interacts with merchant and as the issuer that interacts with consumer (Karnouskos & Fokus, 2004). Whenever consumer initiates any mobile payment, the issuer bank after identifying the consumer and verifying the legitimacy of payment request check for fund availability and finally forwards the payment request to the merchant's payment processor. After receiving the payment notice acquirer bank identifies the merchant and requests him for confirmation of transaction, on the final confirmation, the payment is done notifying all the parties about this payment (Luna, 2017).
4. Mobile Payment Service providers– They develop wallet application or user interface for NFC applications (Penttilä et al., 2016), which can be downloaded from application store. The developing party can be from any related field or from third party. The application providers have responsibility of securely saving virtual money and perform transfer only after proper authentication.
5. Mobile Network Operators- MNOs are the one who provide infrastructure for mobile payment and have huge consumer base. Mobile network operators control SIM (subscriber indentify module)

& WIM (wireless indentify module) card of mobile device (Karnouskos & Fokus, 2004). Telecom companies provides with high speed network for efficient functioning of transaction. The situation can be very gruesome if a consumer wants to pay for the commodity, and he is not able to pay because of non availability of network.

6. Mobile device manufacture- Constant upgradation of technology by enhancing the device capability for the executing the mobile payment services is the main job of device manufacturer (Karnouskos & Fokus, 2004). Mobile device should act as a trust intermediary between bank and MNOs (Dennehy & Sammon, 2015). The manufacturer has responsibility of providing a safe and reliable device at a reasonable price.
7. Software provider- They develop standard compliance software apt for the user and make it available in the market (Karnouskos & Fokus, 2004). It also includes servers and their maintenance staffs, as without which such huge amount of database management is not possible.
8. Government- Government is the regulatory body that defines the rules and constraints so all mobile payment solutions should be developed accordingly (Karnouskos & Fokus, 2004). These rules can be imposed by government legislations and regulations at national or international level. They need to provide secure and efficient system for mobile payment operation (Dennehy & Sammon, 2015), to protect individuals and encourage favorable financial environment (Luna, 2017).

The expectations of various players of the mobile payment ecosystem are listed in the table below:

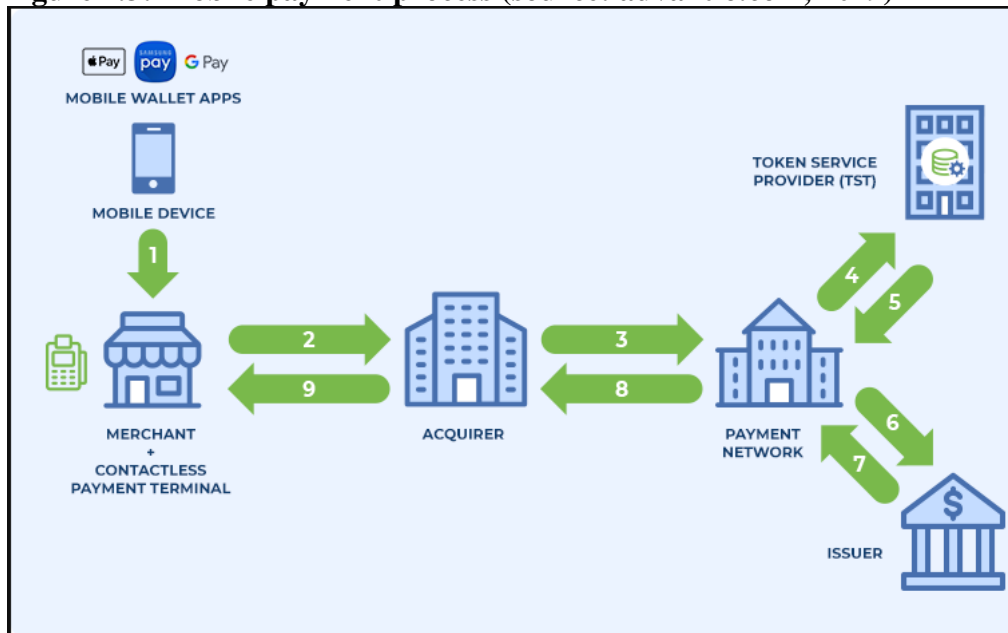
**Table 1.1- Expectations of ecosystem players (Source: Karnouskos and Fokus, 2004; Carr, 2007; Thoi, 2016)**

<b>Player</b>	<b>Expectations</b>
Merchant	<ul style="list-style-type: none"> <li>• Quicker transaction</li> <li>• Low or zero initial and usage cost</li> <li>• Integration possible with existing payment system</li> <li>• High level of security and trust in mobile payment service</li> <li>• Instant payment settlements</li> </ul>
Consumer	<ul style="list-style-type: none"> <li>• Trust and security</li> <li>• Less learning time</li> <li>• Personalized service</li> <li>• Low or zero initial and usage cost</li> <li>• Easy switchable between devices, MNOs and banks</li> <li>• Robust technical support</li> <li>• Easy registration process</li> <li>• Anytime, anywhere and any currency payment</li> <li>• Real-time transaction overview</li> <li>• Peer-to-peer transaction possibility</li> </ul>
Mobile network operator	<ul style="list-style-type: none"> <li>• Potential for value added services</li> <li>• New revenue generation possibility per user</li> <li>• Increase consumer loyalty</li> </ul>
Device manufacturer	<ul style="list-style-type: none"> <li>• Large scale acceptance of new software/hardware of the device</li> <li>• Interoperable, widely used standards</li> <li>• Low cost of new integrated technology</li> <li>• Multi-application support</li> <li>• Relations with other element of ecosystem</li> </ul>

	<ul style="list-style-type: none"> <li>• Low R&amp;D time</li> </ul>
Bank	<ul style="list-style-type: none"> <li>• Branding and consumer loyalty</li> <li>• New business opportunity</li> <li>• Secure payment and scam loss minimization</li> <li>• Integration with existing infrastructure</li> </ul>
Government	<ul style="list-style-type: none"> <li>• Revenue generation through tax</li> <li>• Reduced cost of cash handling</li> </ul>
Payment service provider	<ul style="list-style-type: none"> <li>• Profit maximization</li> <li>• Brand image recognition</li> </ul>
Software developer	<ul style="list-style-type: none"> <li>• Get business from other stakeholders</li> <li>• Constant upgradation in technology</li> </ul>

### 1.1.2.3 Mobile Payment Process

**Figure 1.3: Mobile payment process (source: advantio.com, 2019)**



The user at first provides a payment token to merchant's PoS by scanning a QR code or via NFC. The merchant then sends this encrypted token to acquiring account. The token is then routed to the payment network which

then forwards it to the token service provider for checking the authenticity of the token. If everything is found ok, the payment network requests the issuing bank to release the payment. The release amount is deposited in the acquiring bank account, and the merchant as well as the customer gets the payment completion notification.

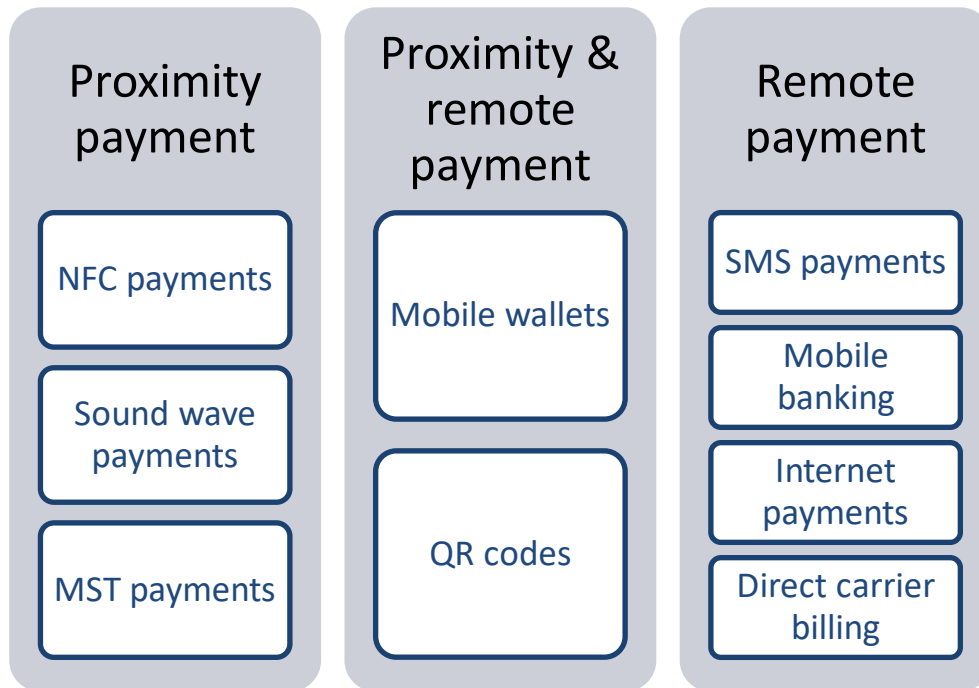
#### **1.1.2.4 Attributes of Mobile Payments**

Various research studies (Dahlberg and Mallat, 2002; Van der Heijden, 2002; Pousttchi, 2003; Karnouskos and Fokus, 2004; Wilmos and Karnouskos, 2004; Mallat N. 2006; Darren et al., 2013; Jinkyung, 2018) have suggested many attributes for mobile payment to succeed in the market such as Accesibility, Availability, Compatibility, Complexity, Cost, Cross-border payments, Customer Data Control, Customer Shopping Experience, Integration of legacy approaches, Interoperability, Local market understanding, Merchant Acceptance, Network externalities, Observability, secured, convenience, Speed, Trialability and Universality.

#### **1.1.2.5 Mobile payment technologies, types and methods**

In India, types of m-payment can be grouped on basis such as closeness between people involved in transaction, message payments, contactless payment, hybrid payment device and category of owner of the system- Bank-led wallets, Telco-led wallets, and Independent wallets (M. Manikandan, 2016). The major types of mobile payment option available in India are given below.

**Figure 1.4: Mobile payment types (source: mobiletransaction.org, 2018)**



#### **1.1.2.5.1 Proximity payment**

This category of payments can be done when the payer and payee are in close proximity of each other. This payment style is best for payment at shops and in public transports like bus and metro.

- a) NFC- Near Field Communication (NFC) is a close-range wireless technology that enables the exchange of data between different devices. The exchange of data can be carried out for wide varieties of tasks including processing of payment (Luna, 2017). Smartphones or PDAs which are enabled with radio frequency ID, capable of emitting low energy sensing technology, can be used to perform payment through NFC (Kerviler et al., 2016). When a NFC enabled phone comes in close proximity means within inches of NFC enabled card machine, they exchange encrypted radio frequencies, and money gets

deducted from the card information stored in the device. Apple pay and Samsung pay are the examples of such technology.

- b) Sound-wave based payment- In this new cutting edge technology, unique sound signal waves is used to transmit the details of payments, from phone to the payment terminal. The best part of this system is that there is no requirement of internet for this type of communication; just a simple software installation can enable any type mobile phone into a payment facilitating device. This technology can be very helpful in areas where owning smartphones is still a luxury.
- c) Magnetic secure transmission (MST) payments- MST is similar to sound based payment, in this magnetic waves are generated to imitate the magnetic strip present on cards. It is through this signal that the card terminal processes as if physical card has been swiped. This helps to avoid card scamming frauds and card loss can be avoided.

#### **1.1.2.5.2 Proximity and remote payment**

This category of payments can be done when in both close proximity and even remotely.

- a) Mobile wallets- These are virtual wallets which uses a secure and complex system to perform payment process. It is usually a mobile application installed in a smartphone which adds money by taking bank/card credentials from consumers. The phone acts as a transmitter of payment information and this added money can be used to pay at close proximity or through the online payment platforms (Abadzhmarinova, 2014). Oxigen was the first mobile wallet launched in India in August 2004.

- b) QR codes- QR is abbreviation of quick response. A large amount of alphanumeric data information is encoded within a square of different sizes that can be interpreted from any angle by scanning. Additionally, QR codes are free from errors, easy to produce and serve many applications (Codes-qr.com, 2016). On pointing the mobile camera towards it after opening special applications, the money gets transferred to the payee. As only pointing a camera phone is required, the code can be even remotely scanned the available picture.

#### **1.1.2.5.3 Remote payments**

This category of payments can be done remotely.

- a) SMS payments- In this payment method, a text message is sent to a specific USSD code with complete payment information in standard format (Crowe et al., 2010). The number used to send text message is linked with the bank account, and user has a unique MMID and MPIN. On verifying the security PIN, the money gets credited from one's account and gets deposited in target account. E.g- m-Pesa. First SMS payment was done in the year 2002 in India.
- b) Mobile banking- It is simply an app developed by any bank and it asks its consumers to install the app on their smartphone. On verifying that the SIM inserted in phone is same as the phone number linked to the account, the app can be used to access the account. Then, the smartphone can be used to do many operations such as checking account balance, transaction history, doing account transfer and generating statements. (Shankar & Kumari, 2016). This eases pressure on bank branches and employees, thus is beneficial for banks in cost-saving. This app can even be used to recharge mobile, pay bills, for shopping etc.
- c) Internet payments- It is a type of payment which is done by using mobile browser such as chrome, safari etc. and on entering card details



or clicking on links the money gets paid to the payee. The digital bill can be sent to the consumer after payment gets settled via SMS or e-mail.

- d) Direct carrier billing- In this type of payment system, mobile network operators is used to make the payment instead of bank. There is a system of entering phone number and after authenticating it, the amount gets deducted from prepaid account or gets added in postpaid bill, and consumer settles bill with the telecom company (Carr, 2007).

### **1.1.3 Mobile Payment Industry and Key Contributing Elements: Indian Scenario**

#### **1.1.3.1 Mobile Payment Scenario in India**

With constant technology upgradation, affordable smartphone backed with dirt cheap internet, inclination towards shopping through mobile and support of the government, m-payment adoption has witnessed a exponential rise. Mobile wallets in India though launched in 2004, m-payments were growing in number at snails pace. Lack of awareness, security, costly phone and costly internet data were the main reasons for such growth. The industry needed much and all around support to perform better. The help came from government in form of IMPS money transfer system. While inaugurating IMPS in Nov, 2010 in Mumbai, Smt Shyamala Gopinath, the DG of Reserve Bank of India said reduction in cash usage in India is the need of the hour, and with launch of IMPS she aimed to increase the use of mobile wallet (Kapoor et al., 2015). Though it was basically for internet and mobile banking, this system attracted people's faith as money got credited in account within few seconds. Slowly and gradually mobile payments started gaining popularity with budget smartphones being launched in market and interesting cashback offers from the mobile payment service providers. M-payment was predominated by few third-party payment providers initially, just with launch

of UPI in 2016 by NPCI diversification in m-payment players started in India. Visualizing the tremendous potential in this industry gradually other stakeholders of the mp ecosystem launched their own mp product. Mobile wallets were launched by banks e.g.- iPockets by ICICI & Yono by SBI, telecom network providers e.g. Jio & Airtel money, third party tech giants e.g. Google pay and PayPal. Government too came on board by launching its own payment app named BHIM. E-commerce mammoth also entered the industry to magnify their profits e.g. PhonePe (acquired by FlipKart), Freecharge (acquired by Snapdeal), and similarly Amazon pay, Ola money have been launched by respective companies. Altogether, they are painting a new picture in the payment scenario of India. Cash to GDP ratio of India is around 12% which is much higher than developed economies like USA & UK. As per KPMG's report in 2019, non cash transactions are expected to reach till 20% by 2023. The Indian Digital Payments report by the payments company Worldline India (WI) reported that in 2019 UPI recorded a transactional volume of 10.8 billion with a 188% Y.o.Y increase. As of December 2019, a total of 143 banks are providing UPI services, with 9 more banks were added in 2019 to the UPI ecosystem. UPI transactions crossed one billion transactions in a single month in 2019, for the first time since its launch, processing nearly 11 billion transactions in the year 2019 (S&P Global, 2020). According to the same report, value of cards and mobile payment crossed the value of ATM withdrawals in 2019, whereby, UPI payment has dominated cards. This increase in UPI transactions may be a threat to banks and card network, similar to situation in China where people are going digital directly from cash to mobile payments ignoring use of cards (S&P Global, 2020).

#### **1.1.3.2 Mobile Payment Players in India**

There are more than 45 mobile wallet providers and approx 50 UPI-based wallet providers in India, according to KPMG (source: Devere-vault, 2019). M-payment in India has diversified players from its ecosystem. Banks, e-commerce giants, third party and government are all providing mobile

payment services in India Major players and their downloads are listed below.

**Table 1.2- Major mobile payments players in India (Source: Socialbeat.com)**

S.No.	Name of the wallet	Key features	User base (July, 2020)	Category
1	PayTm	Owned by One97Communications Launched in 2010, PayTM works on a semi-closed model	300 million	Independent service provider
2	PhonePe	Initially emerged in 2015 as a basic wallet to be used for mobile recharges and bill payments, but was game changer in UPI payments after being bought by Flipkart	150 million	Independent service provider
3	Google Pay (formerly Tez)	Google ecosystem has helped it scale up their user base really quickly, in spite of being a late entrant in Sept 2017	100 million	Independent service provider

4	Freecharge	Launched on August, 2010, Later Snapdeal acquired FreeCharge in April 2015 and in Oct 2017 it was acquired by Axis Bank from Snapdeal	54 million	Independent service provider
5	MobiKwik	Founded in April, 2009	55 million	Independent service provider
6	BHIM	Founded in Dec, 2016 is first of UPI payments. Has partnered with over 100 banks for smoothly onboarding consumers	135 million	Government service provider
7	Airtel Money	Founded in January 2017.	30 million	Mobile network operator service provider
8	Jio Money	Founded in May 2016.	16 million	Mobile network operator service provider
9	SBI Yono	Founded in November, 2017	10 million	Banking service

				provider
10	PayPal	Founded in October, 2018	100 million (world)	Independent service provider

#### 1.1.4 Key Contributing Elements

##### 1.1.4.1 Telecom Scenario

The first mobile call in India was done on 31<sup>st</sup> July 1995, between the Union Telecom Minister Sukh Ram and the Chief Minister of West Bengal Jyoti Basu. Mobile user base reached only 3 million till 2000 because of expensive handsets, low network coverage and high tariff rate. Initially, consumers were charged for even incoming calls which too was a major setback for the telecom industry. It was after the launch of Reliance Communication (2002), which introduced free incoming call service that brought revolutionary change and consumer base rose to 57 million in 2005. It continued to grow at pace of average growth rate of 90% YoY, reaching 584 million subscriber in 2010. With the availability of mobile phones at an ever low price, mobile phone started masses and people even started possessing multiple phones and sim cards. Only after TRAI being strict on inactive numbers and phone number activation norms, the subscriber growth rate slowed, but continued to increase at a steady pace and crossed 1 billion mark in 2015. With the launch of 4G service by Reliance JIO in Sept 2016, India entered into high-speed internet usage community. As many telecom operators closed operations due to bankruptcy and license issues, total number of subscribers now stands at 1.1 billion mark as of Dec, 2019. Currently there are four mobile phone operators working in India. The total number of wireless subscribers in India is 1151.44 million as on 31<sup>st</sup> May, 2020 (source: TRAI), out of which 982.57 million (85.33%) are active users. There are three operators in private sector Reliance

Jio, Airtel and Vodafone-Idea, and one in public sector BSNL with subscriber base as shown.

**Table 1.3- Telecom sector subscriber base distribution (Source: TRAI, as on 31<sup>st</sup> May, 2020)**

S. no	Wireless telecom company	Subscribers (in millions)	Market share
1	Reliance Jio	392.74	34.43%
2	Vodafone-Idea	309.92	27.17%
3	Bharti Airtel	317.80	27.88%
4	BSNL	119.96	10.52%

Private telecom players are playing most important in the mobile payment ecosystem by providing all important networks to most of the Indian population. The telecom sector has to work round the clock to maintain this network system. Some network operators taking advantage of their subscriber base have started their own mobile wallet e.g.- Airtel money and Jio money. Airtel has also financially included its subscribers by launching the Airtel payment bank.

#### **1.1.4.2 Internet Usage Scenario in India**

Internet was used only by military before 1995 in India and research purposes without access to public (source: webnotes). Internet was offered to public in six cities through telephone connection by VSNL on 15<sup>th</sup> August, 1995. It continued to grow at a slow pace till a decade reasons being high cost and slow internet speed. Indian railway started the online booking through internet website in the year 2001. Internet penetration was only 3.6% (40 million) in 2006 which increased to 7% (81 million) in 2009 and 36% (462 million) in

2016 (source: internetworldstats, 2019). Currently, India has second highest number of internet users in the world with 560 million users (source: internetworldstats), and internet penetration will increase by around 829 million Indians by 2021 as per the CISCO report. While internet users in urban India grew by 7%, there was an increase in users in rural India by 35% in 2018 (source: Economic Times, 2019). With this quest for data in rural areas, well internet connected India with no digital gap between urban and rural India is not a distant dream. Not only are the new users adding up but also their internet activeness is high, as reports suggest Indian adults spend 3.5 hours on internet daily (source: emarketer, 2019). Interestingly almost 97% of internet is accessed through mobile phone now in India. This has opened up a huge window of opportunity for m-commerce industry. Mobile commerce is easily making way into new users with exciting deals and offers, eventually paving path for m-payments as by making payments through m-payments option will give the users extra benefits and comfort.

#### **1.1.4.3 Mobile Commerce Scenario in India**

Mobile commerce is a process in which all commercial activities from selecting, buying and paying of products and services are done through wireless devices (Tarasewich et al., 2002). Smartphone fuelled with affordable internet has become part and parcel of individual in this fast-growing world economy. With Smartphone enabling consumer to search for goods and services, at own comfort round the clock, it has been found out that ordering a product from an app takes 150% less time than ordering from desktop site as users get crisp information rather than scrolling through piles of irrelevant pages and pop-ups. According to CII report (2016) m-commerce accounts 60% of online sales, out of which 30-50% purchases by m-commerce is from tier II and III cities. As per Worldpay Inc (2019), annual CAGR of m-commerce is 28%, and is expected to grow to \$54 billion by 2022 in India. Currently, out of total online sales, 51% are via mobile devices and according

to PayPal, 7 in 10 consumers prefer mobile shopping (enterprenuer, 2020). M-commerce allows shoppers to pay digitally thus paving scope of growth of m- payments. M-commerce market is now collaborating with payment industry and we can see today major m-commerce industry players like Amazon, Flipkart, Myntra have either their own payment apps like Amazon pay or have collaborated with already existing m-payments. Thus with the growth of m-commerce, m –payment will boom too.

#### **1.1.4.4 Government Initiatives**

The government is working towards ways to incentivize cashless transactions and discourage cash payments, in order to curb black money and corruption in India. The government's initiatives such as JAM Trinity (Jan Dhan, AADHAR & Mobile) would also facilitate this transformation, as less financial inclusion and lack of digital knowledge are major hurdles in a cashless economy. JDY has witnessed a massive success with an opening of 25.68 crore bank accounts which is really commendable. Aadhar card has helped a lot in this mission, and with 89% of Indian population being aadhar enabled financial inclusion has become very easy (source: timesofindia), as in Jan Dhan Yogna scheme, bank account with zero balance can be opened using aadhar card. A nationwide digital literacy program has been launched name National Digital Literacy Mission with a target to give higher level of digital skills at least one person per household by 2020. The National Digital Literacy Mission is an integrated platform of digital literacy awareness and education that will help rural communities fully participate in the global digital economy. The central government has also promoted cashless transactions through UPI, USSD, AEPS and Rupay Card. The government is mulling over to bringing insurance in the mobile wallet similar to debit and credit card segment. Government asked banks to install additional 10 lakh PoS terminals in different parts of the country. Government other moves such as Payment banks, 100 smart cities all across India, implementation of GST will also eventually help in going



digital. “Go digital”, was the slogan given by PM Mr. Narendra Modi in his radio talk “Mann ki baat”. Kerala is the first digital state in India whereas Akodara is first “digital village” free from cash hassles. Akoli a village in Telangana too is 100 percent digital. These commendable moves by these villages alarm us towards the need of the day calling us to be updated and aware of the changes in our surroundings and call us to join their move in making India cashless or less cash country dream come true.

#### **1.1.4.5 Increase in Digital Transactions**

Cash has always been the king of payment transactions in India, unless for a brief time period when government demonetized 85% of currency notes in circulation in Nov 2016. Though Indian’s love for cash has rather increased as currency in circulation on 4<sup>th</sup> Nov 2016 was Rs. 17.74 lakh crore (source: Economictimes), has now increased to 26.56 lakh crore as on 25<sup>th</sup> Sept 2020 (source: The Hindu Business). But it also cannot be denied that digital payments are reaching new heights since then. The major digital payments used by consumers are listed in the table with its transaction value and volume.

**Table 1.4: Value and volume of digital payments (Source: RBI annual report)**

<b>Financial Year</b>	<b>2015-16</b>	<b>2016-17</b>	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>	<b>Percentage Change from 2016-17 to 2019-20</b>
UPI Volume (in lakhs)	-	179	9,152	53,915	1,25,186	69836%

UPI Value (in crores)	-	6900	1,09,832	8,76,971	21,31,730	30794%
IMPS Volume (in lakhs)	2208	5067	10,098	17,529	25,792	409%
IMPS Value (in crores)	1,622	4,116	8,92,498	15,90,257	23,37,541	56691%
Prepaid Payment Instruments (PPIs) (in lakhs)	7480	19637	34,591	46,072	53,318	171%
Prepaid Payment Instruments (PPIs) (in crores)	48800	83800	1,41,634	2,13,323	2,15,558	157%
Card payments Volume (in lakhs)	19593	34864	47,486	61,769	73,012	109%
Card payments Value (in crores)	3,99,600	6,58,300	9,19,035	11,96,888	15,35,765	133%

As it can be seen that card payments and PPIs (which includes mobile wallets) has just grown by 133% and 157% respectively in value from year 2016-17 to 2019-20. On the other hand, UPI has increased 69836% and IMPS has increased 56691% in value during same time period.

## **1.2 Motivation for the Study**

Mobile payment in India was present since 2003, but it took almost a decade for the industry to get mass acknowledgement. It was after 2014, when mobile payment got its recognition mainly after the three major transformations in Indian society. Firstly, Digital India movement launched by the government aimed at reaching and digitally educating each and every citizen of India, thus creating digital awareness among them. Launch of Reliance JIO in Sept 2016, gave a major push to government's dream by providing high speed internet at dirt cheap price, bringing per GB price to one of the lowest in the world. Secondly, UPI launched by NPCI brought a great advancement in the mobile payment industry by eliminating a major drawback of mobile wallets in which money did not get credited in bank account directly. UPI system was designed to credit money directly in the bank account that too within few seconds. Last but not the least government's major move of demonetization which abandoned use of currency notes of Rs. 500 & Rs. 1000 which constituted 85% of cash in market, created a friendly environment and massive scope for the use of mobile payment. India has always been a cash loving society but it was only after demonetization that India started operating at less cash, and eventually operating at \$ 33 billion less (Gupta & Auerswald, 2019). So these changes pave the path for use of other alternatives of payments like m-payments.

After the demonetization, not only the consumers but merchants too have boarded m-payments in India. From big shops to small shopkeepers everyone started using m-payments and other e-payments after demonetization. Especially for penny transactions, m-payment has proved to be a problem solver. It is important for a business to be updated with latest form of technology and to meet consumers' needs. Merchant is the key to unlock cashless society, as it is they who should believe in the system and if

merchants are unable to accept it, the whole system will be worthless (Dahlberg et al., 2015). There is only 4.9 million PoS terminal (source: RBI bulletin, Jan, 2020) for nearly about 65 million retailers in India, showing a huge gap in digital acceptance. Around 2 lakh crores per year will be saved by the government as cost of printing and transporting cash will decrease. Government is also constantly urging banks and mobile network providers to strengthen their digital infrastructure, for providing safe and secure transactions for consumers and merchants so that more and more people can opt for cashless payments and help boost economy and curb black money. The government has well supported and encouraged merchants to be part of their cashless movement lowering transaction fees and raising transaction limits. Government has reduced MDR charges (cost paid by merchant to bank for accepting digital payments), and is charging zero MDR for payment through RuPay card and UPI mode of payment from Jan 2020. Government of India has also launched Digital India scheme with aim to connect all village panchayats by optical fiber cable. This not only will help the core of India i.e. villages be digitally enabled, but also make them believe in digital system. Government even encouraged rural banks to issue debit cards for farmers so that agriculture related activities can be done through digital means.

Viewing the huge potentials of m-payment market in India, new aspirants in the form of big giants like Google pay, PayPal, Apple and Samsung grasped this opportunity and entered this segment. WhatsApp, which is now owned by another tech giant Facebook, too is on its way to launch its m-payment. If not directly launched m-payment, many globally renowned companies has invested in Indian mobile payment market like around \$2 billion by Alibaba and SoftBank, and \$356 million by Berkshire Hathaway has been invested in PayTM. Parent company FlipKart invested 700 crores in PhonePe, and Mobikwik has raised around \$ 118 million. Also financial institutions, m-commerce giants and existing m-payment players are collaborating among

themselves (e.g. Axis bank bought Freecharge, Flipkart bought PhonePe) to provide efficient service and take advantage of this progressive sector.

These above changes have led to a reformed India where everyone is playing some part in cashless India motto and e-payment and m-payment has become the latest trend. With smartphone playing potent role in daily activities and commerce of people of India and expectation of its growth in subsequent years as mobile payment industry in India is expected to record a CAGR of 22% to reach US\$ 1 trillion (source: globenewswire), it is important to study how well people are making payments through mobile at present. Therefore, it is crucial to know how well the merchants and consumers have adopted mobile payment in their life, and what factors affect continued use of mobile payment.

Mobile payment services (MPSs) are expected to be one of the fastest growing segments of mobile marketing. Mobile payment technology has aided in socio-economic development through financial inclusion and protective security during crises. Mobile payment system has emerged as an important medium of transaction with the growth in mobile communications and information systems. The recent development in the mobile payments with launch of UPI by the NPCI and affordable high speed internet have created reform in this industry and is thus a motivation to study the change in the usage of mobile payments after this massive development. Additionally, demonetization had a huge impact on the consumer inclination towards the usage of mobile payment systems which has further motivated to pursue the study. In India, mobile payment systems is still in its nascent stage, therefore, it is imperative to understand the underlying factors which motivate the continued usage by consumers and merchants.

The present study will contribute to the study of mobile payments by providing the actual reasons of use of mobile payments by consumers and merchants and understanding the role of government initiatives in the use of

mobile payments. This study will contribute significantly in understanding the gap in the level of usage and awareness in two different cities of India.

### **1.3 Relevance of the Topic**

In a developing country like India, where still about 190 million adults don't own a bank account (Forrest, 2020), providing banking services through traditional banks can be costly and time consuming affair. Further, minimum balance rules of bank accounts, service charges, annual maintenance charges etc even make it harder for poor people to hold a bank account. Government schemes' benefits are less likely to reach the beneficiary in absence of bank account due to corruption. This is hindering inclusive growth of the society, and disparity in overall development is observed. An easy and effective solution to these problems is financial inclusion through m-payment.

Mobile payment adoption research is still regarded in its early stage by some researchers (Slade et al., 2013). Consumer adoption intention, although being a widely researched area of mobile payment research (Dahlberg et al., 2015; Dahlberg et al., 2008), not much work has been done on examining the intention to continue use of such payment (Shaikh & Karjaluoto, 2015; Zhu et al., 2017). Thus this research aims at finding the reasons for the merchants and consumers to continue their use of mobile payments in future. Also despite plethora research of m-payments, it appears from the literature review that most previous m-payments research has been undertaken from the perspective of consumer adoption, rather than with the focus on merchant (Dahlberg et al., 2007; Dennehy & Sammon, 2015; Cabanillas et al., 2016). As a result of limited existing research, a lot remains unknown about the merchant perspective of adoption (Dahlberg et al., 2015). Besides, study of one aspect solely will lead to restricted knowledge about mobile payments (Dahlberg et al., 2015). Merchants' participation in promoting a payment service is vital for wider points of acceptance (Dahlberg et al., 2007). Although there is

exponential rise in global adoption of m-payments, merchants' acceptance is the major disruption in the growth process. Narrow acceptance of mobile payment by merchants will discourage the consumers too (Au & Kaufmann, 2008), as consumer use of payment systems is simultaneously connected with merchants' mobile payment adoption (Pousttchi, 2008) and likewise merchants are unwilling to invest in the systems needed to enable an m-payment transaction unless there is consumer demand (Sammon & Dennehy, 2015). So it is important we study both consumer and merchant acceptance side by side.

M-payment topic is worth studying in country like India as M-payment is a recent trend here. Although few studies on m-payment adoption have been done in India in the past, in the context of cities such as Bangalore (Padashetty & Kishore, 2013), Mumbai & Delhi (Thakur, 2013), Hyderabad (Vally & Divya, 2018), NCR (Tiwari et al, 2019), Chennai (Manikandan & Jayakodi, 2017), Ahmedabad (Brahmbhatt, 2018). Comparative study between two or more cities is lacking. Previous literature (Dahlberg et al., 2015; Dennehy and Sammon, 2015) suggested multi-market and multi-country study and also previous researchers suggest that different socio economic status and different lifestyle could have impact on the adoption of mobile payments therefore this work is aimed at a comparative study between two different cities of India to see if difference in standard of living has any impact on use of mobile payment or not. So to understand the actual impact we have selected two different tier cities Ranchi and Kolkata to have a comparative study in awareness and use of mobile payments.

#### **1.4 Scope of the Study**

- This study primarily focuses the dual side perspective of both the merchant and consumer in knowing about the acceptance and adoption of the mobile payment systems. Thus, awareness and usage level of

Mobile Payment System has been studied. Also future continuance of use of Mobile Payment System has been studied

- However, this study does a comparative study between capitals of two different states only i.e. West Bengal and Jharkhand. Thus covers Kolkata city and Ranchi city covering total population of about 60 lacs.
- Further this research focuses on the impact of demographic factors and other adoption related factors on the use of mobile payment system.

## **1.5 Thesis Outline**

### **Chapter 2- Literature review**

This chapter covers the literature work done in the areas – factors of mobile payment adoption in various countries, various technologies used and theories involved for both consumers and merchants, and the linkage of these literatures with this research has been studied. This chapter highlights the gap found in the current literature, and discusses how this research will fill this gap.

### **Chapter 3- Research Methodology**

This chapter throws light on the strategies adopted by the researcher to find the results. It contains objectives the researcher wants to achieve, details of sample size, research instrument used, area coverage of data collection, pilot survey and main survey. In this chapter hypothesis formulation was done which will find the results.

### **Chapter 4- Data Analysis and interpretation**

This chapter covers the details of analysis of data collected after pilot survey and main survey. The statistical tools used for the analysis were discussed. Effect of demographic factors was studied on continued use of mobile payment. Hypothesis testing was done to find the factors which influence continued use of mobile payments.

### **Chapter 5- Results, Discussion and Conclusion**



This chapter gives the summary of the findings of the research, and discussion on the results has been done. The implications of the study have been discussed, and conclusion has been drawn.

## **1.6 Summary**

This chapter summarizes the basic concept of mobile payment, its types, uses, advantages and disadvantages etc. Motivation behind the research was presented, and relevance of the research was explained. The scenarios of mobile payment and its supporting industries were discussed. The outline of chapters which will follow has also been drawn.

# **CHAPTER 2: REVIEW OF LITERATURE**

# **CHAPTER 2: REVIEW OF LITERATURE**

## **2.1 Overview**

The purpose of this chapter is to thoroughly review the previous literatures in the area of mobile payment and then briefly explain the essence of the appropriate literatures. A literature review is the most important part of any research and it is most enlightening and informative. Extensive research was done to know about various concepts and model theories related to the topic. This chapter briefly explores the historical context of the mobile payment system. This chapter covered literatures related to both merchants and consumer adoption and also covered important and most cited literatures in the field of mobile payments from across the world. The most recent researches have been discussed later in this chapter. Research were searched from few keywords like – consumer, adoption, merchant adoption, m-payment, mobile money, cashless, e-wallet, m-wallet, intention to adopt, nfc payment, TAM, UTAUT, e-payments. Research papers were taken from the database of Google scholar, researchgate, infliplibnet. Researches published in both renowned and not much recognized journals were considered.

## **2.2 Literature Review of Mobile payment**

### **2.2.1 Historical Context of Mobile Payment Systems**

Mobile payment is the recent development in the field of mobile technology and is thus popular research topic. Many mobile payments have been developed in different countries till date some providing their services

domestically whereas others globally. There are many mobile payments alternatives available in the market to choose from for both consumers and merchants. There are lots of P2P mobile payments options available like N26's Moneybeam, Elopay, Kesh, Paypal, Cringle, Lendstar, Vostar and Hallo Freunde in Germany, similarly PayM in the UK (Slade et al., 2015) and TextPayMe in US is too peer-to-peer mobile system. There are various other types of m-payments available globally with functions of peer to peer transfer, use of mobile as wallet, ticketing, VAS etc. M-payments available in different places – in Asia are – UMPay, Oxicash SMS pay, Shinginko, Moneta, Turkcell, S!Felica, G-cash Alipay (Ayodele A., et al. 2013) KakaoTalk (Shin et al., 2014), in Europe are Paybox, TagPay, PosteMobile, Mpay wallet, Mobipay, Zong (Liébana-Cabanillas et al., 2014), in Africa, M-Pesa, U-MO, PocketMoni, POCit, Airtel Money, Orangemoney, in America are Obopay, P2P cash, Synovus, Boku, Eficash, Zong. Some of the most popular mobile payments worldwide are ApplePay, GooglePay, SamsungPay, PayPal (Harris et al., 2019; Vishwanathan, 2018). In case of India, some of the most used mobile payment systems are Oxigen wallet, PayTm, MobiKwik, Ola Money, FreeCharge, BHIM, SBI buddy, Pay U Money (Pal et al., 2019; Routray et al., 2019). PayTm constitutes half of the total mobile wallet's user base in India (Joshi et al., 2019), whereas BHIM, being the payment app introduced by the government made a major reform in making mobile payment industry (Pal et al., 2019).

Mobile payment ranges from success to failure whereby some services providers even discontinued their services (Mallat, 2007). There is history of success in some market like Kenya where M-Pesa is highly successful since 2007 (Mbogo, 2010), which was later imbibed by Philippines, India, Bangladesh and Pakistan (Islam, 2016). But same M-Pesa is not much successful in other countries like South Africa, Philippines and Ghana, also not in India (Sinha et al., 2018). Similarly Z-Pesa was not successful in Tanzania (Anthony & Mutalemwa, 2014). M-payments have been very

successful in countries such as Singapore, Norway, Austria, Japan and South Korea (Lee et al., 2004; Schaettgen and Taga, 2010), experiencing low adoption rates or failure to date (Cellan-Jones, 2012). Mobile payment is viewed to strive hard to succeed in developed countries due to various competent existing alternatives to it (Hampshire, 2017 ; Slade et al., 2015) but still use in mobile payment has taken upsurge in various countries such as UK (UK Finance, 2019 ; Slade et al., 2015). mobile payments solutions have also been less successful in Europe and North America (Au & Zafar, 2008) in comparison with Asian and developing countries (Schierz et al., 2010; UK Payments Council, 2013). Egypt and the Democratic Republic of Congo use mobile payments as a form of quasi-money (Batchelor, 2007). M- payments is gladly adopted by unbanked markets (Au & Zafar , 2008) to meet the financial gap, as a result of poor existing means of payments (Bourreau & Verdier, 2010) and poor financial infrastructure (Cellan-Jones, 2012). Many researchers (Barutcu, 2008; Matthews et al., 2009; Xu et al., 2010; Andreev et al., 2011) also claim that consumer lack interest in mobile payments as compared to other functions of their mobile phones such as mobile advertising, mobile coupons, mobile social media and mobile media.

There is an increase in annual publication from 65 to 121 from the year 2007 to the year 2016 and cumulative publication increase from 444 to 630 publications from 2007-11 to 2012-16. This means m-payment research continued to be studied throughout the spanned period (Gupta et al., 2017) Further the study also found that India with 6.98% share ranked 3<sup>rd</sup> among the top 10 countries of the largest global publication to China being first with 26.26% share and USA being 2<sup>nd</sup> with 9.59% share.

### **2.2.2 Literature Review on Consumer Adoption**

Intensive research has been done in technology adoption area covering different domains like m-commerce, e-commerce, internet banking, m-banking, e-payments, e-wallets, m-payments etc.

Kurnia and Ali (2012) did a B2B e-commerce adoption comparative study among grocery industry of Indonesia and Bahrain. Lack of proper government intervention was found to be a barrier to adoption. Thakur and Srivastava (2012) studied about the consumer adoption intention of mobile commerce in Indian context by developing a research model with the use of technology acceptance model and innovation resistance theory. They too found out perceived usefulness and perceived ease of use as two significant determinants in context of mobile commerce impacting the technology adoption readiness. Social influence was also found to be of significant importance for technology adoption readiness indicating high influence of peer group in the m-commerce adoption decision. Also, perceived credibility risk (security risk and privacy risk) strongly affected the adoption intention negatively. Makame et al. (2014) studied the factors affecting e-commerce adoption in Tanzania by use of extended TAM model, adding National Policy Initiatives and Trust to the original model. By analyzing data using LISREL, findings revealed trust as an important factor for e-commerce adoption, which is affected by technology infrastructure. Further, National Policy Initiatives was found to bear strong influence on perceived ease of use, perceived usefulness, technology infrastructure and trust. Singh & Islam (2016) too did a study on emergence of M-commerce in India and explained the advantages & drawbacks of m-commerce and factors influencing the m-commerce growth and its adoption. Another study was done in North America by Shaw & Sergueeva (2016), where they studied adoption of smartphones among consumer for m-commerce and used UTAUT2 model including the privacy calculus and the theory of convenience. 352 samples from Canada was taken out of which 300

valid data was analyzed. The results revealed perceived value, perceived convenience and hedonic motivation were the most significant factors in determining intention to use of m-commerce.

Donner and Tellez (2008) studied various cases on emergence and acceptance of m-banking/m-payments. Malhotra & Singh (2010) did an exploratory study to find the factors determining adoption of internet banking for 88 banks in India. Dash, Bhushan and Samal (2014) empirically examined the consumer's adoption factors of mobile banking. They incorporated Diffusion of Innovation (DOI) theory with mimetic force and tried to gain an insight into mobile banking adoption. Their research findings suggested compatibility and trialability as strong predictors of attitude with regards to mobile banking adoption. Hanafizadeh et al. (2013) did a systematic review of 165 research articles published on the adoption of Internet banking during 1999 and 2012. Martins et al. (2014) presented an integrated UTAUT+PCR research model combining UTAUT with perceived risk, considering seven different kinds of risk for adoption and use of internet banking, where addition of risk in the model was found to be of significance in explaining 56 % of the variance of behavior intension. Ruangkanjanases & Wongprasopchai (2017) empirically examined the factors affecting adoption of m-banking among Gen Y (born during 1977 to 1994) and Gen Z (born after 1994) in Thailand. Analyzing data from 400 respondents, they found out compatibility, self efficacy and perceived usefulness to be positive and significant factors influencing consumers' adoption decision for both the generations. Gen Z was highly influenced by the social groups. Tam and Oliveira (2017) in their research paper studied 64 research articles from top journals in the span of 2002 to 2016. Perceived ease of use and perceived usefulness was found to be of most influencing factors for m-banking adoption intension. Foroughi et al., (2019) recently found out the factors determining the continuance intention to use through technology continuance theory (TCT) and added self-efficacy and channel preference to the theory.

After reviewing the existing literature it was found researchers have studied Mobile Payment in context of various countries depending on their place of residence, study and interest out of which maximum work has been done in the field of consumer acceptance / adoption / use concerning factors influencing or determining that adoption/ acceptance/ use behavior decision of the individual (Cabanillas et al., 2014; Mallat, 2007; Pham & Ho, 2015). Some study has been done in context of adoption of different technologies involved in mobile payment. Few researchers have also studied adoption by consumer in different scenarios. Different research studies have been done in the context of various countries such as United States of America, Canada, UK, Finland, Sweden, Netherlands, Germany, Spain, Switzerland, Turkey, Kenya, Zambia, Tanzania, New Zealand, Australia, , Vietnam, China, Hong Kong, Thailand, Taiwan, Bangladesh, India and many other countries. Some of the latest researches with most relevance are discussed below.

#### **2.2.2.1 Literature Review on Consumer Adoption of M-Payment in Various Countries Determining Factors**

Schierz et al., (2010) through their empirical study, focused on the factors determining consumer's acceptance of mobile payment services of German people. For their study the 1447 respondents, who were mobile users were considered. They developed an extended Technology Acceptance Model with constructs of perceived usefulness, perceived ease of use, attitude towards use, perceived compatibility, perceived security, individual mobility, subjective norm and intention to use and used structural equation modeling to test their model. Finding disclosed that perceived compatibility has most significant influence on the intention to use mobile payment services whereas individual mobility was found to be the key driver of mobile payment acceptance. Also



their research proved to be with the most significant predictive ability till date with 84 percent of variance in predicting dependent variables association with consumer acceptance of mobile payment services. Petrova & Mehra (2010) through an exploratory study investigated how mobile service-oriented features and demographic factors influence consumers in forming their attitudes towards mPayment in New Zealand. They developed a research framework with the constructs derived from TAM and Input Process Output (IPO). Regression analysis showed that convenience and affordability were significant predictors affecting PU. Also, monthly mobile spending and the variations of this spending may strongly influence perceived usefulness.

Peng et al. (2012) explored factors influencing tourists acceptance of tourism m-payment in China. They adopted extended TAM model by adding perceived compatibility, perceived security, destination m-payment knowledge and interpersonal susceptibility. They found out that in addition to PU & PEOU, perceived security plays important role in tourist intension to use. PEOU is affected by knowledge of destination m-payment, and PU is affected by perceived compatibility and perceived security. Another study in China of Yang et al. (2012) attempted to identify the determinants of pre- adoption of mobile payment services and explore the temporal evolution of these determinants across the pre-adoption and post-adoption stages from a holistic perspective including behavioral beliefs, social influences, and personal traits. Their most significant findings show that behavioral beliefs in combination with social influences and personal traits are all important determinants for mobile payment services adoption and use, but their impacts on behavioral intention do vary across in different stages.

Ayodele et al. (2013) investigated the level of adoption of mobile payments in Nigeria. They used TAM model constructs integrated with relative advantage, compatibility, complexity, cost and trust and security to formulate their own

research model. 227 valid responses were taken out of total 250 responses. Data analyzed using multiple regression revealed relative advantage was the strongest predictor in explains behavioral intention to use mobile payments, followed by ease of use, trust and usefulness respectively. Further, it was seen that Nigerian are willing to opt cashless options due to its advantage of convenience, ease of use, ease of access, reduced time of transaction.

Anthony and Mutalema (2014) studied about factors influencing the use intention of Zantel's Z-pesa services in Tanzania. They too used Extended Technology Acceptance Model, including perceived mobility, perceived low cost of the mobile payment services, perceived expressiveness, perceived trust, perceived support from mobile services provider , as the other extended variables. Through convenience sampling they only used 120 responses which they analyzed and found out cost and added utility of mobile payments as major hindrance in the use intention. Overall Z- pesa showed lot of flaws as it was perceived as not so easy, non trustworthy lacking mobility and service availability.

Li et al. (2014) studied the factors and the influence mechanism which effect Chinese adaption intention of mobile payment based on TAM model, theory of social psychology and innovation diffusion. Factors were ranked as the most significant factors for use of mobile payments in the order of altitude, consumer's trust in the operator, number of merchants, scope of service, cost to use, subjective normalization and operation scenario.

Phonthanukitithaworn et al. (2014) investigated factors affecting consumer intention to adopt m-payment services in Thailand. The result found out that m-payments service was determined by four factors: compatibility, subjective norms, perceived trust and perceived cost. Recent studies explain BI as being influenced and shaped by one's attitude and subjective beliefs, which in turn are shaped by their beliefs associated with motivations and evaluation of beliefs. (Phonthanukitithaworn, et al., 2014), that the influence of friends,

parents, and colleagues can become a critical determinant in improving consumers' willingness to use m-payment

Shaw (2014) investigated the factors that influence consumers to adopt the mobile wallet in Canada. They extended TAM by adding construct of trust, informal learning and mobile wallet self-efficacy. Perceived usefulness was found to be the most significant factor and trust also was significant factor, whereas perceived ease of use was insignificant. There was a significant impact of self-efficacy on perceived ease of use but insignificant on perceived usefulness. Further informal learning on intention to use was found to be significant, mediated by trust.

Cabanillas et al. (2015) did an empirical research and proposed a model to find the factors determining use of mobile payment system in Spain. Age was used as a moderating factor, and it was found to be significant in influencing users' decision. It was found out that younger users are more inclined towards new technological tools than the older.

Kabata (2015) investigated the motivational factors that influence the use of mobile payment services in Kenya. The regression results revealed six variables; perceived usefulness (PU), perceived ease of use (PEOU) and perceived enjoyment (PE), perceived security (PS), age and education level significantly influenced consumer use of mobile payment services in Kenya. Whereas, social influence and gender did not influence the use of mobile payment services.

Wang & Idertsog (2015) studied user intention to use mobile payments in Taiwan. This study used an extended technology acceptance model integrated with perceived ease of use, security, attitude toward using M-payment service and behavior intention to use M-payment. Regression analysis was done and the findings were consistent with previous studies and it was found that

security and perceived ease of use were significant predictors of the attitude to use mobile payment service.

Aydin & Burnaz (2016) studied factors impacting attitude development towards mobile payment use in Turkey. For this they extended TAM model with personal innovativeness, perceived security, compatibility and social influence. Data was collected from 640 respondents through random sampling out of 54,000 downloaders of mobile wallet application. Affect of innovativeness was main concern for the study, and it was found out that almost all the respondents were innovative, and had positive attitude towards mobile payment system. Independent variables explained 62.2% variance on attitude towards intention to use; usefulness and ease of use were the strongest predictor having direct influence, whereas compatibility and security too had significant influence towards attitude intention towards mobile payment. Mobile payment is believed to be in its early stage in Turkey.

Aydin & Burnaz (2016) studied adoption of Mobile wallet by consumers and factors affecting users and non users in Turkey. For their research, sample size of 1395 was taken from the mobile wallet application of one of the leading mobile network operators in Turkey using stratified random sampling. Constructs studied were – Personal Innovativeness, Perceived Security, Ease of Use, Compatibility, Perceived Usefulness, Social Influence, Rewards, Attitude, and Use Intention. Data was analyzed through PLS- SEM method and revealed that social norms had very low impact on use intention which is unsupported by many previous researchers. Ease of use was found as the most influencing factor on mobile wallet use among users and second important factor for non users. Personal innovativeness showed no direct impact on attitudes and had insignificant influence on use intentions for users and had low impact on non-users. People perceived as more innovative have positive attitude towards use intention and thus they find mobile wallet easier to use.

Gan (2016) investigated factors influencing mobile payment service adoption intention of users in China. They too used extended TAM model adding subjective norm and use context as additional constructs, and tested it through PLS method. Total of 375 valid responses were obtained and analyzed. The model explained 60.2% of the variance in intention to use mobile payment services. PU, EOU and use context significantly influenced behavioral intention to use mobile payment system, whereas subjective norm was found to be insignificant.

Kim et al. (2016) in South Korea studied factors of adoption of mobile payment for fintech services. They adopted ELM (elaboration likelihood model), to examine the influence of personal mobility, perceived usefulness perceived ease of use, credibility, social influence, concern for information privacy, self-efficacy on the acceptance of fintech-type payment services. By testing the relationship among the central and peripheral paths in the acceptance of fintech-type payment services, it was found that the central path was found to have more influence than the peripheral path. Usefulness, ease of use, self efficacy and social influence were found to have a positive influence on intension to use.

Lesana and Tembo (2016) studied consumer's behavioral intention to use or not-use m-payment services by applying extended Technology Acceptance Model (TAM) to their research work in Zambia. 152 respondents were selected from current-users, capable-users, regulators, and bank staff. According to the regression result, 55.7 percent of the variance among dependent construct was explained by the research model. Social norm proved to be the most important factor followed by perceived usefulness and perceived ease of use on behavioral intention to use m- payments. Similar to Diniz et al., 2011, in their research also cost showed negative effect on m-payment but it was of least significance on consumer's use intention of m-payment.

In Bangladesh, Islam (2016) investigated drivers and barriers stimulating in the acceptance of mobile payment, for which extended Tam model was adopted. Data was collected from two mobile financial service institutions and mobile network operator, also 260 consumers of Mobile Money service of m-payment using different MNO and MFS. Regression analysis revealed that behavioral intention had the greatest significance on actual use of mobile payment. Perceived risk had greatest significance on behavioral intention, followed by perceived cost and perceived ease of use. Subjective norm was seen as significant mediator factor for perceived usefulness and perceived ease of use to influence behavioral intention to use mobile payment service. Mobile payment was found to be in early stage.

Nguyen et al. (2016) examined the factors that influence consumer intention to use mobile payment services in Vietnam. A total of 489 data were collected from shopping malls, supermarkets, electronics and appliance stores, and resident neighborhoods. The regression results revealed 83.9% of the variance for the constructs on the intention to use mobile payments. Among all the constructs, perceived trust came out as the strongest predictor of mobile payment services use intention followed by perceived ease of use, perceived enjoyment, perceived behavioral control, perceived usefulness and subjective norm. Perceived trust also showed strongest influence on behavioral intention.

Oliveira et al. (2016) identified the main determinants of mobile payment adoption with the intention to recommend this technology in the future. For their study, they developed a conceptual model combining UTAUT2 and attributes of DOI theory, along with perceived technology security. Data were collected from students and alumni of universities in Portugal and analyzed using Structured equation modeling (SEM). The model was validated explaining 71.8% of behavioral intention to adopt mobile payment. The result revealed the highest influence of compatibility on behavioral intention to adopt mobile payments, followed by perceived technology security,

performance expectancy, innovativeness, and social influence. These factors showed a direct positive influence on behavioral intention to adopt mobile payment and the intention to recommend this technology. Consumers showed interest to recommend the use of mobile payment to others through their social networks etc. Effort expectancy, facilitating conditions, hedonic motivation and price value were insignificant predictors of behavioral intention.

Phonthanukitithaworn, et al. (2016) identified the factors influencing an individual's intention to use m-payment services focusing comparison among two groups i.e, current users (adopters) with potential users (non-adopters). According to the study results compatibility, subjective norms, perceived trust, and perceived cost influenced current users' intentions to use m-payment services. Whereas, potential users' intentions to use m-payment were influenced by subjective norms, compatibility, ease of use, and perceived risk. In terms of their intentions to use m-payment services, subjective norms and perceived risk had the strongest influence on potential users, while perceived cost had the strongest influence on current users. Similarly, Pal et al. (2015) examined the difference between the adoption pattern of early adapters and late adapters in Thailand. For this purpose authors developed an extended TAM model in which they added two users constructs (Personal innovativeness & NFC knowledge) & four system constructs (user mobility, reachability, compatibility & user convenience). Sample size for the empirical analysis was 270, and the Chi-square test was used to for hypothesis testing. The results suggested that previous knowledge about NFC technology is important to PEOU for early adopters, and user's convenience is important for late adopters. It was found out that early adopters are doubtful about the usefulness of the NFC.

Pinchot et al. (2016) explored the barriers to adoption of mobile payment among American university students. Data was collected 136 undergraduate and graduate students of Mid-Atlantic University were taken as sample through convenience sampling. The included lack of awareness, lack of

availability and perceived security risk, and all were found to be significant barriers in the adoption of mobile payment.

Mu & Lee (2017) investigated factors that influence users' intention to adopt third party mobile payment. They compared mobile payment provided by two companies in China, Alipay and WeChat pay. TRA & TPB were used for model formulation and constructs taken were trust, ubiquity, communication, social influence, compatibility and usefulness. The findings suggested that intention to use is influenced by trust and PU. Compatibility and social influence positively influenced trust and PU.

In Taiwan, Yeh and Tseng (2017) studied college students' behavioral intention of using mobile payment. They used UTAUT2 model to see the influencing factors on consumer's intention. They found out the better performance expectancy, facilitating conditions and habit, to be influence the use of mobile payment the most. Whereas, behavior intention negatively influenced by hedonic motivation.

Zhu et al. (2017) studied intention to continue use of mobile payment provided by a specific provider Alipay in China. ELM model was adopted by them with constructs of Intention to Use, Competitors' marketing efforts, trust, subjective norms, perceived usefulness, perceived integration, and source credibility. A total of 332 samples were collected from the Alipay users out of which 320 valid response were analysed through PLS method. Consistent with Zhou (2014) trust was found as an important factor for use intention. Subjective norm was also found to be significant .It was found out that source credibility, perceived usefulness, and perceived integration have significant impact on intention to continue use and they were also found to affect trust. Trust was found as an important factor for use intention.



In China, Yu et al. (2018) investigated the mechanism of enhancing trust when consumer shifts from online payment to mobile payment, and examined that how satisfaction and continuance intention of users is affected by trust. A total of 219 respondents were selected for analysis, which had past experience of using Alipay's desktop site and application both. Findings suggested trust in online payment imposes trust on mobile payment. Also, the consumers who find similarity between online payment and mobile payment, there is high level of trust. The trustworthy service provider enhances usage experience and their satisfaction is high.

Humbani & Wiese (2018) investigated factors that influence adoption of mobile payment. Multiple regression analysis was indicated that convenience and compatibility drive consumers' adoption whereas risk, cost and insecurity are barriers in South Africa.

Vallespín et al. (2018) investigated the level of trust in mobile payment among tourists. For this purpose he surveyed 456 regular travelers using smartphones. Upon using Chi-square test, it was found out that education, income and marital status has no impact on trust level. The results suggested that there is a medium level of trust among tourists in Spain.

Mobile payment is used for payments of various utilities. Consumer Adoption of m-payments has been studied in various utility contexts like for payment of fees, e- government services, restaurants bill payment. Ahsan et al (2012) in Australia studied use of mobile payment for various e-government services and the factors affecting the adoption of such services. Based on their literature review they found discarded theory and instead used characteristics of mobile payments as constructs for their study summarizing 13 positive influencing features (Ubiquitously available, Simple to use, Time-independent, Place-independent, Diversified services, Used in lieu of cash, Spent more time on mobile than PC, Credit facility, Instant confirmation of transaction, Less time to complete a transaction, New technology, Access to internet

service and Savings on fixed cost), and 14 negative influencing features (Privacy, Confidentiality, Personal details, Transparency, Traceability, Authentication, Trustworthiness, Non-repudiation, Legal provision, Technical knowledge, Dispossession, Data interception, Hacking & Virus) for acceptance of mobile payment. Out of 13 factors Convenience, Technological Impulse and Credit Facility added to the acceptance of mobile payment in e-Government services whereas out of 14 negative factors also only 3 factors Operational Reliability Risks, Technological Protection of Security and Casual and Incidental Risks obstructs the acceptance. Transportation service was found to be the most appropriate service out of all services for making good utilization of mobile payment technology in the e-Government environment. Tossy (2012) examined the use of the mobile phone for making payment of school fees in Tanzania. For this various candidates of primary and secondary school examinations were surveyed. To discover the factors affecting the payment of fees through mobile he proposed the adaptation of the UTAUT model where he added perceived risk and trust as the additional constructs. The rationale of this study was based on the increase in numbers of ownership, access and usage in mobile phones among primary and secondary school students. Out of six factors four were found to be significant factors: performance expectancy, social influences and trust and perceived risk. Hamza and Shah (2014) in Nigeria studied adoption of mobile payment among students of tertiary institutions. But they also examined relationship among gender and other factors. They used extended TAM model adding perceived compatibility and social norms to original constructs (perceived ease of use and perceived usefulness). Sample population was 214 respondents from Bayero University Kano (BUK), North-West University, and Kano University of Science and Technology (KUST) Wudil, Kano, Nigeria. By regression analysis, variables explained 34 percent of the variance in behavioral intention to adopt mobile payment system. Perceived usefulness, perceived ease of use and social norms were found to have most impact on behavioral intention to adopt mobile payment system. Also, the independent

T-test result revealed that gender has an impact on the influence of perceived ease of use and social norms on intention to adopt mobile payment, where male PEOU influenced male over female, and contrary SN influenced female over male.

Mobile payment adoption has been compared among culturally different countries lately to understand the global adoption of mobile payment. Zhong (2009) did a comparative study of mobile payment procedures in two different markets – Chinese and Finnish. It is believed that mobile payment consumer penetration is faster in China as compared to Finland. He studied several cases of mobile payment services in Finland such as transport ticket service, shopper service, value-added services, electronic mobile payment service and international mobile payment service. In China, he studied third party payment procedures of companies such as Union Mobile Pay, SmartPay, ChinaDotMan, YeePay and PayEase. Findings suggested developing a generally accepted mobile payment solution with interoperability for different markets with different benefits. Ting et al. (2016) used the theory of planned behaviour (TPB) to investigate the influence of attitude, subjective norm and perceived behavioural control with their respective predictors of behavioural beliefs, normative beliefs and control beliefs on the intention to use mobile payment system by comparing Malays and Chinese residing in Malaysia as they are ethnically and culturally different. They used purposive sampling technique so selected only the one who possessed mobile phone. By multiple regression and t-test it was revealed that attitude, perceived behavioural control and subjective norm are predicted positively by their respective belief factors having a positive influence on use intention. Both Malays and Chinese differ in perceived safety, interpersonal and external influences, subjective norm, normative beliefs and use intention. This suggests that the two ethnic groups have different intentions for the use of mobile payments. Zhang et al. (2018) did a cross culture adoption comparison of mobile payment between China and USA. They developed their own model combining the constructs of

two most preferred models TAM and UTAUT. Chinese were more influenced by their social and peer groups than the Americans. In comparison to Chinese, Americans proved to be more rational and risk avoiders worrying about the security and privacy breach. The findings suggested that social influence and personality traits have directly impacted technology acceptance, whereas demographics, past behavior, socioeconomic status, and culture play different moderating roles.

#### **2.2.2.2 Consumer Adoption of M-Payments' Different Technology**

Mobile payment uses different technologies to function. Early research has focused mainly on SMS technology (Mallat, 2006; Ondrus & Pigneur, 2006), even now some researcher focus on remote payment (Slade et al., 2015). Proximity payment being recent technology became popular for study lately (Balachandran & Tan, 2015; Kerviler et al., 2016; Leong et al., 2013; Li et al., 2014; Luna et al., 2017; Pal et al., 2015; Pham & Ho, 2015; Ondrus & Pigneur, 2006; Slade et al., 2014). Some researchers even did composite study on both remote and proximity payments like Cabanillas et al., 2017; Luna et al., 2019; Shin et al., 2014). Kapoor et al., 2013 and Kapoor et al., 2015 studied Interbank mobile payments Service in India. Andreev et al., 2011; Shaw, 2018 studied adoption of mobile payments through use of individual's mobile phone. Wearable is the latest technology used for making mobile payments. Contactless bracelet such as Celego is used to pay for tickets of transport (Gemalto, 2016). Smart watch such as Apple smart watch is used globally for micropayments with the help of ApplePay (Apple, 2017). Similarly, Samsung smart watch is also used for payments (Samsung, 2017). Microsoft with the use of its Microsoft band 2 allows the consumer to pay at Starbucks (Luna, 2017).

NFC came in 2007 and is considered as future of mobile payment (Ondrus & Pigneur, 2009). Adequate researches have been carried out covering NFC technology in mobile payments since then. NFC is more popular in USA,

Canada, Korea, Japan (Pal et al., 2015). Ondrus & Pignuer (2009) evaluated potential of NFC for mobile payment and whether it will prevail in the future market of Sweden. For this purpose they organized a roundtable conference of 16 industry experts from various sectors such as finance, telecom, retail, technology, and public transport. After data interpretation, it was found out that all industries appreciated NFC technology, and would like NFC to prevail in the market. Balachandran & Tan (2015) investigated the factors that affect intention to adopt NFC based mobile payment by consumers in Malaysia. For this purpose they combined Innovation Diffusion Theory, and the attributes considered for adoption are relative advantage, complexity, compatibility, trialability and observability. The findings suggested that relative advantage is not important for intention to adopt, if consumers perceive NFC difficult to understand they will not use it, compatibility favours intention to adopt, complete information about NFC will intend to use it, consumers will adopt NFC if it comes with other services in addition to payment, consumers will adopt NFC if cost of using and maintaining NFC is low. Pal et al. (2015) studied the adoption of NFC technology in m-payments. The result revealed that people with a high degree of personal innovation find the NFC payment system easy to use and people posing some prior background knowledge about the NFC payment system can easily adapt it. Pham & Ho (2015) studied factors affecting intention to adopt NFC payments in Taiwan. The results showed compatibility, perceived usefulness, additional values, trialability and perceived risk were among the greatest determinants of behavioral intention, whereas perceived ease of use, trust and cost were found to be unimportant. Li et al. (2014) used extended Tam model to find factors affecting consumers' adoption of NFC. Luna et al. (2017) investigated factors that directly or indirectly affect the adoption of NFC technology in Brazil. They found increase in the use of NFC technology with rise in use of other mobile related application. As NFC is easy to use with unlimited functionality, it is gaining popularity among the user. Personal innovation in IT, attitude and perceived usefulness are factors affecting of future use of NFC technology. Another

study by Ramos de Luna et al. (2018), examined the factors of consumer acceptance of mobile payment systems using NFC technology through a conceptual model. The research was based on the TAM and included the perceived compatibility, perceived security, personal innovativeness and individual mobility in the research model. Their results indicated that variables such as attitude, subjective norms and personal innovativeness are determinants of the future intention to make payments via the NFC technology.

Kerviler et al. (2016) investigated consumer adoption of proximity mobile payment systems in France. They tested the low penetration of mobile payment services using value theory. They compared risk associated with proximity mobile payment with its perceived benefits (utilitarian, hedonic, and social) and effects of perceived benefits, perceived risk, greater experience with an in-store mobile service, in store m-info search effect of m-service experience on intention to use proximity mobile payment. They found out that perceived benefits and risks more strongly impact proximity payment than proximity m-info search, and suggested that to pay through a smartphone an extra push of offers is needed.

Lee et al. (2012) studied the factors related to the use intention of mobile financial services in Korea. They included general technology perceptions, technology-specific perceptions, user characteristics, and task user characteristics of the service. 240 of respondents from bank participated in the study. Duane et al. (2014) studied about consumer willingness to use their smartphone to make m- payments in Ireland. For this, they investigated the impact of trust, personal innovativeness, and perceived ease of use, perceived usefulness and mobile self-efficacy in explaining consumers' willingness to use Smart Phones to make M-Payments. 59 of mobile phone users after meeting the required criteria were considered for the study and the data obtained were analyzed through PLS (SEM) which explained 53.4% of the construct's variance. Trust came out to be the most important variable among

all for consumer's willingness to pay through their mobile, perceived ease of use and perceived usefulness showed less importance while mobile self-efficacy and personal innovativeness were almost insignificant. Kapoor et al.'s (2014) empirically tested and compared the impact of innovative attributes, taken from three different sets (Rogers, 1969; Tornatzky and Klein's, 1982; Moore and Benbasat, 1991) on adoption of Inter-bank mobile payment services in the Indian context. The constructs were relative advantage, compatibility, complexity, trialability, and observability taken from Rogers', 1969, cost, communicability, riskiness, and social approval from Tornatzky and Klein's, 1982 and finally voluntariness, image, result demonstrability, and visibility from Moore and Benbasat, 1991. Additionally behavioral intention and adoption was studied to find the impact of above mentioned 13 attributes on them. To get a homogeneous data response, total of 74 adopters and 249 non-adopters were selected from four different cities i.e, Delhi from north, Bangalore from the south, Kolkata from east, and Mumbai from the west. The result from linear regression analysis, revealed that except observability rest all other four construct (i.e, relative advantage, compatibility, complexity and trialability) adapted from Rogers', 1969, were found to be significant predictors of behavioral intentions of the consumers. Whereas out of 4 attributes, adapted from Tornatzky and Klein's, 1982, three attributes namely cost, communicability and social approval were found to be significant predictors while only riskiness was found insignificant on behavioral intentions of the consumers to use interbank mobile payment services. Finally out of 4 attributes, adapted from Moore and Benbasat, 1991, two variables i.e, voluntariness and result demonstrability were significant predictors while other two i.e, image and visibility were found as insignificant predictors variables on consumer behavioral intention. With adjusted R-square, comparison among all three sets of attributes showed that attributes from Rogers', 1969 provided highest satisfaction followed by Moore and Benbasat, 1991 and Tornatzky and Klein's, 1982.

Consumer acceptance of Mobile payment was even compared for different technology associated with m-payment by the researchers. Cabanillas et al. (2017) compared the factors that influence consumers in using close proximity NFC payment and remote SMS payment to find out the factors influencing their consumer use. This study was done in Brazil by using TAM Model integrated with perceived risk and subjective norm factors. Attitude was found as the most important variable for both SMS and NFC payments affecting consumer use intention. It was also found that next important factor for SMS payments was perceived usefulness whereas social influence counted as second significant factor for NFC types payments. Other two important factors for SMS payments in sequence of significance were subjective norms, and perceived security while for NFC payments it were perceived usefulness and perceived security. Further, I.R. de Luna et al. (2019) did a comparative analysis of factors affecting consumer acceptance in three different technologies associated to m-payments. For this SMS (Short Message Service), NFC (Near Field Communication) and QR (Quick Response) were considered to find out the factors that influence the adoption of these m-payment systems. This study was done in Spain and included TAM model integrated with perceived risk and subjective norm factors. While Subjective norm was the most important variable for SMS, it was also found important factors for the other two technologies. Perceived usefulness, perceived ease of use, perceived security and attitude was found important affecting all three technologies but perceived usefulness was most important factor for QR mobile payment system. This indicated that consumers do behave differently in using different technology of m-payment systems. Further interrelationship between the dependent variables indicated significant difference except for the following- perceived usefulness and intention to use, attitude and intention to use and perceived security and intention to use.

Shin et al. (2014) did a comparative studied between two culturally different countries Korea and USA, where they considered both proximity and remote



mobile payment systems for the study. The sample size was taken as 283 American respondents and 314 Korean respondents. Regression analysis was used to test three important factors- security, cost and convenience to find out the influence on mobile payment frequency. They found out that the adoption of mobile payment is low in USA as compared to Korea, because Americans are satisfied with available card payment system. The regression analysis showed mobile payment security is the strongest factor in both countries which influences payment frequency. Slade et al. (2015) studied factors affecting the adoption of proximity mobile payments (NFC) for non users in UK which was believed to be first research of such kind in UK. They used UTAUT2 model integrated with trust and risk as the two additional constructs and suggested use of UTAUT 2 for future studies as suggested by Venkatesh et al., 2012 and Leong et al., 2013. Their study suggested that NFC too is being recognized among the users as remote mobile payments and believed it as the future of mobile payments. They opted for convenience sampling to select their respondent and gather data for their research. By performing multiple regression their result revealed the strongest influence of performance expectancy on non users' intention to adopt NFC m-payments. Habit, social influence, trust and perceived risk also influence non users' intention to adopt such payments. UTAUT 2 was validated by the researcher and the role of trust and risk was also established in the adoption of mobile payments. Hedonic motivation which was significant by Venkatesh et al., 2012 was found to be insignificant in this study with this inclusion of risk and trust. Slade et al. (2015) studied adoption intension of RMP (Remote mobile payments) first time in the UK. They used the UTAUT model in their current study by adding three additional constructs namely innovativeness, risk and trust and taking knowledge about mobile payment as moderating factors. They suggested to use the UTAUT model in future research too as it was believed to be useful by Williams et al., 2011. They used convenience sampling in this research by taking staffs and students as their respondents from two educational institutions. Snowball technique was also used as the initial respondents were

urged to help in getting more respondents by sharing this survey. A monetary lottery was 59ebruary to strengthen the response rate which was suggested by Deutskens et al., 2004; Sauermann & Roach, 2013. Structural equation modeling (SEM) was preferred by them and they found that social influence, performance expectancy, innovativeness, and perceived risk significantly influenced non-users adoption intention for remote mobile payments, social influence being the greatest predictor among all. But non-users who pose previous knowledge about remote mobile payment finds trust more important while the ones without previous knowledge find utility of remote mobile payment most important for adoption of such payments.

### **2.2.3 Merchant Adoption of Mobile Payment: A Literature Review**

M-payment adoption has also been studied in the context of merchants but it is very recent and less in comparison to the consumer adoption aspect of m-payment system. M-payments for merchants have been studied to basically find out the factors which lead to investment decision of merchant in m-payments technology and barriers faced by them in adopting m-payments.

Hayash & Bradford (2010) explored the mobile payment adoption in retail. For this purpose open-ended questionnaire was used to gather information from 21 industry experts in HongKong. The findings suggested that applications that are widely accepted are more likely to integrate more merchants. Lai & Chuah (2010) investigated the external forces and merchant's own capabilities which influence the adoption of mobile payment by merchants in Hong Kong. A semi-structured survey was carried out on 21 industry experts to find the insides of retail adoption of mobile payment. The findings suggested that retail merchants must give special attention to young consumers and micro-payment transaction for increased usage, and give attention to promotion. Market forces and organizational enablers play a crucial role in influencing adoption. Mbogo (2010) investigated the success factors that contributed in the use of mobile payment by micro business

operators using M-Pesa in Kenya. M-pesa has been very successful in Kenya, and subscriber base was increasing at rapid during research, and majority of micro business operators were using M-pesa for various services. By using the extended TAM model, it was found out that the money transfer technology plus its accessibility, cost, support from government and service provider, and security factors are responsible for intention to use and actual usage of the mobile payment services by the micro businesses. Behavioral intension to use is highly correlated with perceived convenience, and significantly correlated with actual usage.

Ahsan et al (2012) examined the factors that influenced consumer adoption of mobile payments and what influenced consumers to pay through mobile payments for e-Government services in Australia. An online questionnaire-based survey was used to find out the positive and negative factors of adoption. It was found out three factors influenced the acceptance of mobile payment in e-Government services, which were 'Convenience', 'Technological Impulse' and 'Credit Facility'. On the other hand, three negative factors which were, 'Operational Reliability Risks', 'Technological Protection of Security' and 'Casual and Incidental Risks' hinder the acceptance. Peng et al (2012) investigated the effects of perceived security, perceived compatibility, destination m-payment knowledge, and tourist susceptibility on use of m-payment by the tourists at tourist destination. By face-to-face questionnaire surveying and using the Structured Equation Model, they found out these factors strongly supported use of mobile payment by tourists. It is important for tourists to make tourists feel safe using mobile payment.

Chandrashekhar & Nandagopal (2013) discussed problems faced by merchants in using m-payment at retail PoS in India. By interviewing 33 merchants in Coimbatore city, they found out that there is very low merchant readiness for implementation of m-payment, and this is mostly because of trust issues. They

suggested that merchants should be made aware about the benefits of m-payment.

Petrova & Wang (2013) did a qualitative study to find out the factors and challenges related to adoption of mobile money by small businesses. By conducting interviews with semi- structured questionnaire, it was found that merchants found m-payments are efficient and time-saving leading to higher revenue generation possibility. So, service providers need to develop m-payment with the keeping interests of SME businesses in mind.

Chale & Mbamba (2014) studied the influence of mobile money in the growth of SMEs in Tanzania By doing multiple regression analysis, it was found out that the businesses which used mobile money for sales transactions, efficiency in purchase of stock, receiving payment, payment of goods and services, savings as well as money transfer, showed positive growth in their business.

Otieno & Kahonge (2014) investigated that when an organization thinks of adopting mobile payment, how technological, organizational and environmental variables affect their decision, or are there any unknown possible extra reasons for them to consider by SMEs in Kenya. For this purpose they used Structured Equation Model (SEM) and concluded that there was significant effect of various technological, environmental and organizational factors on the adoption of mobile payment.

Guo & Bouwman (2015) analyzed m-payment ecosystem from the merchant's point of view, by conducting interviews to identify thirteen elements resource configurations, strategy orientations, managerial issues , compatibility, perceived security, trust, consumer readiness, critical mass, marketing strategies, platform openness, partner readiness, intuition pressure and market opportunity that play an important role in merchants' adoption of m-payment in China.

Sidek (2015) discovered the factors that influence both consumers and merchants in adopting e-payment in Malaysia and find out the interconnection if any. 100 business owners, 500 consumers and 37 director-level officers of service providing various companies were questioned for survey data. The findings suggested that decision of a business to adopt e-payment technology was affected by seven organizational factors (human resources, business resources, technology resources, governance, business strategy, commitment and awareness). Business characteristics identified as moderators for the business model were firm age, firm size, and business performance. Meanwhile, for consumers' age, gender, level of education, and usage experience were the moderators for the consumer model.

Sokobe (2015) inspected how background of the entrepreneur and their ease of use of electronic gadgets influence adoption e-payment in SMEs. Electronic payment is advantageous for SMEs as it reduces their transaction time, help in credit processing, help design consumer products and financing terms. After using a close ended questionnaire to survey 50 hotel managers in Kisii town, he found out that the background characteristics of entrepreneurs such as age, level of education, and relevant basic skills strongly influence the adoption of electronic payment by SME hotels.

Thoi (2016) investigated the benefits perceived by merchants influencing them to adopt mobile payment in Sweden. 14 merchants from various industries were considered for analysis. The findings suggest that knowledge is required to pass the instep threshold, taking advantage of each other's installed base, acting on their own behalf to increase consumer base, expenses rather than profitability, enables the implementation of loyalty programs, enables conversion of physical cards into virtual, perceive barriers as low and perceive

enough values are the key mechanisms for merchants to adopt mobile payments within the Swedish market.

Cabanillas & Rubio (2017) examined the perspective of merchants regarding adoption of mobile payments. Semi-structured questionnaire was used to interview merchants and neural network analysis was done to find out that, micro-sized enterprises are more likely to adopt mobile payment as they find it advantageous.

Cabanillas et al (2017) examined the reasons because of which merchants refuse to adopt mobile payment systems in Spain, through exploratory and qualitative investigated the determinants of m payments. Upon surveying 151 retail merchants, it was found out that demand for mobile payments has to be increased, trust in new technology is to be developed, cost effectiveness, secured infrastructure and increase in turn over will strongly influence the merchants to adopt.

#### **2.2.4 Literature review on Mobile Payment Research: Indian Context**

Goyal et al. (2012) evaluated perception of urban mobile banking users in India. Through structured questionnaire 100 respondents were surveyed. On using one way ANOVA for testing, it was found out that mobile handset operability & security are critical issues. They suggested that players of m-banking ecosystem should come up with solutions to ensure consumers a safe m-banking environment.

Raina (2014) gave an overview of all available technologies of mobile payment available in India, and detailed process of performing the emerging e-payments. This also included the security point of view at transaction, network

and application level. He concluded that mobile payments converges different stakeholders MNOs, telecom companies, handset manufacturers and payment service providers on a single platform.

Roy & Sinha (2014) examined the factors influencing consumers' adoption of e-payment, popular options, check the level of awareness and its usage and find suggestions for improvement of e-payment in Kolkata city. After randomly surveying 650 consumers from various fields, it was found out that Perceived ease of use (PEOU) is most significant factor in continued use of e-payment and consumer attitude had least significance for adoption.

Yadav et al. (2014) investigated consumer's intention to adopt internet banking by combining TPB and extended TAM. Sample size of 210 young consumers was used for the survey. Structured Equation Modeling was used to find the results which showed that perceived usefulness, attitude, subjective norms and perceived behavioral control strongly influenced consumers' intention to adopt. Results showed that consumer do not find using internet banking easy and they feel internet banking is a risky affair.

Sikdar and Makkad (2015) investigated a five-factor model of adoption of online banking by Indian consumers. The sample size was taken as 280. Findings suggested that trust, usage constraint, ease of use, accessibility and intension to use are valid factors that determine internet banking adoption among Indian consumers.

Singh & Islam (2015) used secondary data to find out there has been constant rise in all deciding factors which support e-commerce industry, making path easy for m-commerce to flourish. M-payment with secure payment sessions will transform the future as per authors.

Wani & Ali (2015) in their article Review & Scope in the Study of Adoption of Smartphones in India, summarized theory of innovation diffusion, showed the present scenario of smartphone market in India, and suggested a model for adoption of smartphones in India. They suggested that, on adding additional constructs of TAM, will give insights of consideration for buying smartphones.

Shankar & Kumari (2016) examined the factors which influenced adoption rate of m-banking in Indian consumers. After collecting data of 248 consumers and on conducting exploratory factor analysis, it was found out that usefulness had most impact on adoption, with awareness, ease of use, compatibility, self efficacy and social influence have positive impact on adoption of mobile banking. Security and privacy are major concerns for consumer, which negatively impact adoption rate.

Kumar et al. (2017) investigated the intension of use of mobile wallet among university students. Using TAM in addition of cash crunch factor, it was found out that cash crunch significantly influenced adoption of mobile wallet.

Manikandan & Jayakodi (2017) studied consumer perception toward mobile wallet, factors influencing its adoption and problems faced by consumers in use of mobile wallet in Chennai city. Upon analyzing responses of 150 respondents, it was found out that there will be tremendous growth in mobile wallet usage as they have a large base of satisfied consumers. Brand loyalty and convenience play important role in adoption of mobile wallet and security concerns negatively impact user adoption.

Podile & Rajesh (2017) investigated the impact of transaction related factors including convenience, security, costs, incentives and procedures on cashless transactions in India, technical factors, lack of technical knowledge to consumers, financial limitations and delayed reimbursements. After collecting



data from 195 respondents through questionnaire and performing Chi-square test, it was found that people are getting comfortable with cashless mode of payments, but negative issues such as security, poor network and lack of merchants' willingness are impacting the cashlessness drive. If the problems are rightly addressed by government and banks, India can achieve its dream of cashless India.

Roy & Sinha (2017) examined the variables that influence adoption of e-payments and investigated how demographic factors influence in adoption of e-payments. Authors determined 465 as their sample size, and chose chi-square test, one way Analysis of Variance (ANOVA), Correlation analysis, Regression analysis, Factor analysis, Multiple regression for hypothesis testing, and SEM was used to test the difference in adoption level. The results indicated that PU, PEOU and perceived risk are indicators of consumers' adoption of e-payment. The study suggested that it was important to educate consumers about security features of e-payment as it is hindering adoption of e-payment.

Sahu & Singh (2017) examined the factors that will help India become a cashless economy in Allahabad city. After conducting qualitative analysis, through literature review and interviews of experts, 13 factors were found like government policies, market, type of card, type of mobile etc. influenced the usage of mobile payment in India.

Shukla (2017) developed a model to predict consumers' liking and investigated business trends. By studying secondary data from RBI and sampling 400 respondents from Lucknow, it was found out that lack of awareness, poor promotion and poor internet connectivity are major issues in growth of m-wallets. He suggested that the service providers should focus on age group above 45 for larger business volume.

Singh et al. (2017) tested model of consumers' satisfaction and intension towards mobile payment. Sample size of 204 North Indian consumers was taken for the survey. Regression analysis, descriptive analysis and ANOVA tests were done, and the result suggested consumer's perception, preference and satisfaction show strong relationship among each other.

Tripathi and Nanda (2017) investigated impact of digital payments on retail industry and on shopping behavior of consumers in Delhi NCR region. Primary and secondary data were analyzed to find the results which showed that India is getting ready for cashless economy and if consumer's needs are understood online retailing will boom.

Ashoka & Ramaprabha (2018) in their research measured the perception of consumers in usage of mobile banking and investigated that does region has impact on adoption of m-banking. The major findings suggested that, age group and occupation has no influence on mobile banking usage. Study revealed that perceived ease will lead to perceived usefulness.

Lonare et al. (2018) inspected the variation between user base to two different tier cities, studied adoption by small retailers and trends which brought increase in e-wallet usage. The authors found out that users in metro cities are more than tier-2 cities, and ease of use supported adoption of e-wallet. There is less impact of e-wallets due to demonetization and the wholesaler vendors still have not adopted e-wallets.

Vidyashree et al. (2018) investigated people's attitude towards digital money and whether people prefer to use it. The authors found out that people have positive attitude towards digital payment, and suggested that banking institutions should build secure and fast online transactions for better adoption rate.

Vally and Divya (2018) investigated that do demographic factors have positive impact on digital payment system after demonetization. Primary data was collected from 183 respondents from Hyderabad and Chi-square test was used for analysis. It was found that technological development have improved performance of banking sector and awareness plays a crucial role in usage of technology.

Eswaran (2019) investigated the impact of demographic factors on adoption of digital payments mode. 150 were taken as sample size, and ANOVA test was used for hypothesis testing. It was found out that except education, no other demographic factor has impact on adoption of digital payment.

Tiwari et al. (2019) investigated adoption of digital wallets in NCR region and suggested ways to increase adoption of digital wallet. The sample was 200 respondents and ANOVA test was done to find the results. It was found out that gender and age had impact on level of awareness. It was found that there existed a strong relationship between demographic and preference of digital wallets over cash.

### **2.2.5 Literature review on Review Papers on Mobile Payment Systems**

Dahlberg et al. (2008), reviewed previous literature on mobile payment services, analyzed the different factors that impact the market, and gave directions for future research on this field. They proposed a framework of four contingency and five competitive factors, and organized the contemporary mobile payment research under the proposed framework for their analysis. The findings showed that social/cultural factors are scarcely studied in the mobile payment context. Also, factors like legal, regulatory and standardization environment and its influence on mobile payment services development are not studied. More research considering merchants was also

suggested by them. Another similar study was done after 7 years by Dahlberg et al., (2015) in their research paper named. A critical review of mobile payment research, where they studied 188 articles published during the last eight years (2007-2014), of which 87 were in major conferences or in journals with an impact factor greater than 1.0. Findings revealed that even after 15 years of research next to nothing is known about merchant adoption, competition between mobile and other payment instruments, and the impacts of changes in commercial, legal, regulatory, social and cultural environments. Also, the study reveals that the researchers have continued to study adoption interest only.

Diniz et al., (2011) in their research Mobile Money and Payment: a literature review based on academic and practitioner-oriented publications (2001-2011) , studied 94 peer-reviewed articles and 92 non-peer-reviewed practitioner-oriented publications. The work focused on mobile payment/mobile money (as opposed to mobile financing in general) with a special stress on local development (but not limited to works that deal with development or developing countries). They suggested future researchers to consider the works done so far by previous researchers and suggested studies on social and economic factors affecting adoption of mobile payment. Albuquerque et al. (2016) in their another paper, Mobile payments: a scoping study of the literature and issues for future research, studied 94 peer-reviewed papers published between 2001 and 2011 to provide a comprehensive picture of the knowledge, production and dissemination about mobile payments . The study revealed some major gaps in the previous researches. Many of the reviewed papers relied on TAM and its variations to determine the factors that may influence the adoption of payment by consumers and/or merchants at the micro (individual) level, neglecting other important contextual and institutional factors, such as regulation and socio-economic implications. Also there was lack of in-depth case studies that closely analyze the wider socio-economic implications (i.e. at the meso-level of communities and macro level

of countries) of practical mobile payment schemes. The study also revealed that most of the previous researchers concentrated only on those few mobile payment projects that have become famous and established, and thus have ignored more recent and smaller projects. Another observation was that there was lack of primary multiple case studies with cross-country comparisons of mobile-payment schemes.

Dennehy & Sammon (2015) studied 40 papers including top twenty cited papers since 1999 and the twenty most recently published papers on m-payments since August 2014. The study aimed at identifying the key research themes and methodologies researched. Study revealed that there has been a shift in focus by researchers examining the m-payment phenomenon with an increase in empirical studies which suggests that m-payments as a research phenomenon has stabilized in recent years as researchers in general have established the characteristics of an m-payment system that are widely accepted by the research community. The study also reveals an increase in studies examining the legal, regulatory & standardization issues and the technology, security & architecture issues and their impact on multiple stakeholders, indicating that these are influential factors that shape the design of the m-payment business model, as well as being a key driver for the adoption of an m-payment system. Similar to the findings of Dahlberg et al., (2007), consumer adoption continues to be a popular aspect of research throughout the time frames this research and researchers have continued to use TAM as a model for understanding technology adoption.

Harris et al. (2019), reviewed 57 research papers with prime focus on consumer mobile payment adoption in the past. Similar to the findings of Dahlberg et al. (2015), TAM and UTAUT/UTAUT2 were found to be the primary models for the adoption research.

Jain & Singhal (2019) provided a systematic review of literature on digital banking adoption published from Jan 2005-2018 of 27 national articles of

Indian origin and 73 International articles appeared in 53 journals and represent a reasonably deep view in the field of digital banking acceptance research. Findings suggest that TAM and its modification to explain the usage of m-banking technology. One of the findings of the study is that of all the researchers conducted worldwide on internet banking, mobile banking, m-wallets or e-wallets the target population is youth i.e. university or college students. Very few numbers of studies are conducted on 30+ age groups. Also social variable is the most prominent factor in adoption of technology.

## **2.2.6 Theories Used in Adoption Research**

Various theories have been developed to study the adoption behavior. These theories are used solely or in combination for further development of research models by the researchers in their study to study the behavioral intention of individual towards a particular technology. Researchers have focused on developing and testing models using these theories since three decades to predict the information system (IS) adoption and usage. TAM has been the most successful and most adopted theory that has been tested by significant number of researchers. TAM was first conceptualized by Davis in 1985, which was later first model was developed in 1986 and finally the first modified version was given by Davis et al in 1989 and later in 1996 final version of TAM was released by Venkatesh & Davis.

Davis (1989) developed new scales for perceived usefulness and perceived ease of use, which are main constructs of TAM. Venkatesh and Bala (2008) developed an integrated TAM model by including individual IT adoption. Subjective norm, Image, Job relevance, Output quality, Result demonstrability, Computer self-efficacy, Perceptions of external control, Computer anxiety, Computer playfulness, Perceived enjoyment, Objective Usability, Experience, Voluntariness.

TAM is most popular among all the models and is used in almost most of the technology acceptance research (Lee et al., 2013) because of its simplicity to use (Lai, 2017). As per Bagozzi 1992 best model to be incorporated is one with most parsimony. TAM is considered as a mature model (Im, Hong and Kang, 2011). TAM is the one of the most used models for mobile payment research in Indian context (Pal et al., 2019).

### **2.2.7 Variables Used in Mobile Payment Research**

The term demographics refers to particular characteristics of a population which includes age, race, gender, city, religion, income, education, occupation, home ownership, gender, marital status, size of the family, health and disability status, and psychiatric diagnosis. Regarding technology adoption, demographic variables affecting the adoption intension are age, gender, education, income, occupation, city etc. Venkatesh et al. (2003) stated that gender and age are important factors in technology adoption. Dahlberg and Oorni (2006) found that age and occupation are differentiating factors for mobile payment adoption. Alafeef et al. (2011) studied affect of demographic factors on adoption of mobile banking in Malaysia, where they revealed that demographic factors (age, gender, income, education) have superior impact than any other adoption factor. Chan & Chong (2013) too studied demographic factors and their effect on technology adoption.

- Age- Wood (2002) found out that age group of below 25 yrs easily adopt new technology, than older generation. Dai et al. (2007) found out that older people use more m-commerce than younger generation in China, because of their less income. Perera (2007) and Alafeef et al. (2011) found that age has impact on use of m-payment services. Padashetty & Kishor (2013) found out that teenagers are willing to learn and adopt

new technology, than adults of past generation. Li et al. (2014) stated that people of different age groups show different willingness to use mobile payment services. Cabanillas et al (2014) found out that age has significant role on behavior and technological acceptance. Another study by Kabata (2015) in Kenya too showed similar results where age was found to strongly influence use of mobile payment services. Shaw (2015) found out that there is no difference in intension to use mobile wallet between young and old consumers.

- Gender- Gender as a moderating variable was studied by many researchers. Venkatesh & Morris (2000) found gender to be a vital factor in technology adoption and usage in which they found out that males are more inclined towards adoption of technology than females. Liaw (2002) revealed that male students used web technology more than the female students. Similarly, Perera (2007) and Chen & Nath (2008) in USA, found that gender has impact on use of m-payment services. The finding of Alafeef et al. (2011) in the context of gender was consistent with the findings of the above mentioned researchers. Shaouf and Altaqqi (2018) did a literature review regarding gender difference in IT domain including research papers of the period 2000-2017, and suggested gender difference as an important factor in moderating relationship between different influencing variables, where they found out that men have positive tendency to try a new information technology than women.

Dai et al. (2007), and Hamza & Shah (2014) found no significant difference in adoption of mobile payments. Similar finding was observed by Li et al. (2014) in case of willingness of purchase through mobile payment and Jaradat & Faqih



(2014) on adoption of m-payment technology in Jordan. Kabata (2015) showed that gender has no influence on use of mobile payment services in Kenya.

- Income- Mattila et al. (2003) found level of education as an important factor for use of internet banking. Monsuwe et al. (2004) found out that higher income group will tend to adopt new technology early. Dai et al (2007) too supported the above findings. Alafeef et al. (2011) found income has great impact on adoption of mobile banking in Jordan. Chan & Chong (2013) found out that education level influence m-commerce activities. Li et al. (2014) stated that people of different income groups positively influence use mobile payment services. Abayomi et al. (2019) too found that education qualification as influencing factor for adoption of mobile banking services in Nigeria.
- Education- Burke (2002) found out that higher education will lead higher inclination online modes of shopping. Mattila et al. (2003) found out that internet banking adoption is highly influenced by the education level of respondents. Alafeef et al. (2011) found education has great impact on adoption of mobile banking in Jordan. Chan & Chong (2013) found out that education level influence m-commerce activities. Similarly, Kabata (2015) too supported the finding. Abayomi et al. (2019) found that education qualification is not significant for adoption of mobile banking services in Nigeria.
- Occupation- Abayomi et al. (2019) found that occupation as influencing factor for adoption of mobile banking services in Nigeria.

### 2.2.8 Findings from Previous Research Regarding Independent Variables

- i. Perceived usefulness- Perceived usefulness as defined by Davis (1989) as *“the degree to which an individual believes that using a particular system would enhance his or her job performance”*
- ii. Perceived ease of use- is one of the main construct of TAM model. Perceived ease of use is defined by Davis (1989) as *“the degree to which an individual believes that using a particular system would be free of effort.”*

Several studies have proved positive role of both perceived usefulness and perceived ease of use on technology adoption decision by consumers. Chen and Adams (2005) found out perceived ease and perceived usefulness has significant importance for use intention of consumers to adopt m-payments. Cheong & Park (2005) found both the variables of utmost importance for mobile internet adoption in Korea, whereas, Wu & Wang (2005) found both the variables as important factors for mobile commerce adoption. Dahlberg et al (2008) too proposed that both perceived ease and perceived usefulness exerts great impact on users intention to adopt m-payments. Kim et al (2010) too supported the importance of perceived usefulness and ease of use for consumer's adoption of mobile payment. Jeong and Yoon (2013) found positive impact of perceived ease of use on mobile payment system. According to research review done by Karsen et al. (2019) of research papers between 2014 & 2018, perceived ease of use and perceived usefulness are the most important factor for using mobile payments system. Pal et al. (2019) also found perceived usefulness and perceived ease of use as the most studied factor in the Indian context.

- iii. Social influence – Park et al. (2007) in their study found social influence to affect adoption decision. Scheirz et al. (2010) too found out subjective norm to have greater impact on consumer's

decision to adopt mobile payment. Yang et al (2012) also suggested that social influence poses high impact on potential users to take adoption decision. Social influence is among the top 10 factors for using mobile payment system (Karsen et al., 2019).

## 2.2.9 Brief Summary of Research Work

**Table 2.1: Brief summary of research work**

<b>Sl. No.</b>	<b>Literature Reviewed (Title of the paper, article etc. along with the source, i.e. the name of the Journal, magazine, Book etc.)</b>	<b>Literature Type (Research paper, Review paper, Chapter of the book etc.)</b>	<b>Author/s</b>	<b>Gist of Points Gained</b>	<b>Linkage to this Research</b>
1	Mobile Payment: A Journey Through Existing Procedures And Standardization Initiatives	IEEE Communications Surveys & Tutorials	Stamatis Karnouskos & Fraunhofer Fokus (2004)	Concept of mobile payments, players of mobile payment ecosystem, characteristics , mobile payment procedures are dealt in this research	This research paper is of very importance as this provides the basic knowledge about mobile payment system.
2	Mobile payments: Moving towards a wallet in the cloud?	Communications & Strategies	Sophie Pernet-Lubrano (2010)	Mobile payment could be the initial step towards ubiquitous means of payment. Wallet cloud	It helped in arriving at future scope of mobile payment

				e.g. TV, car, game console, tablets etc. could be used for future payments.	
3	Influence of age in the adoption of new mobile payment systems	Computers in Human Behavior	Francisco Liebana-Cabanillas, Francisco Munoz-Leiva and Juan Sanchez-Fernandez (2015)	Age of users has been studied as the moderating variable with other variables.	This research helped in finding impact of age on mobile payment adoption
4	Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits	Computers in Human Behavior	Shuiqing Yang, Yaobin Lu, Sumeet Gupta, Yuzhi Cao and Rui Zhang (2012)	Factors affecting pre-adoption and post adoption including behavioral beliefs, social influences, and personal Traits.	This research helped me in finding the factors for my research
5	A Study on the Scope of the Virtual Wallets in Indian Market –Issues and Challenges	International Journal of Multifaceted And Multilingual Studies	Mr. Sai Kalyan Kumar Sarvepalli and Dr. N. R. Mohan Prakash (2016)	The researcher has proposed a model helpful for the virtual wallet companies- EARN Model, E – Empathize, A – Adoption, R – Reiterate, N – Nexus. This research also discusses the advantages,	This helped me in understanding about virtual wallet in Indian context.

				disadvantages, issues and challenges of Indian virtual market.	
6	A Comparative Study Of Smartphone User's Perception And Preference Towards Mobile Payment Methods In The U.S. And Korea	The Journal of Applied Business Research	Seungjae Shin, Won-Jun Lee and Dustin Odom (2014)	Two technically advanced countries Korea and U S has been compared for mobile payments adoption where adoption was seen more in Korea in comparison to US	This research helped in comparative study among Ranchi and Kolkata
7	Determinants of behavioral intention to use mobile wallets – a conceptual model	Journal of Management	Prajod Sunny and Ajimon George (2018)	Adoption of mobile wallet is studied where demonetization has been studied as one of the independent variables.	This research helped in finding impact of government on mobile payment adoption
8	Trends in mobile payments research: A literature review	Journal of Innovation Management	Denis Dennehy and David Sammon (2015)	This paper reviewed literature from 1999 to august 2014 and identified the key research themes and methodologies used for m-payment	This helped me work on the gaps to avoid repetitive work

				research studies.	
9	The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application	Electronic Commerce Research and Applications (Research paper)	Yoris A. Au and Robert J. Kauffman (2006)	This research discusses the mobile payment system, theoretical background and gave a framework of m-payment ecosystem. They also analysed the issues of various stakeholders involved.	This helped to understand basics of mobile payment system.
10	A Compendious Study of Online Payment Systems: Past Developments, Present Impact, and Future Considerations	International Journal of Advanced Computer Science and Applications (Research paper)	Burhan UI Islam Khan, Rashidah F Olanrewaju, Asifa mehraj Baba, Adil Ahmad Langoo and Shahul Assad (2017)	Discusses the current scenario of various electronic payments worldwide.	The informations of this research paper helped in understanding the various e-payments and adoption factors
11	An Empirical investigation on the Relationship Between Technological Infrastructure and	International Journal of Arts and Commerce (Research paper)	Mberia Paul Muthure, Dr.Gorretty A Ofafa, Muathe Stephen M A. and Ms. Jedidah	Poor Technological infrastructure and excessive taxes paid by m-payment agents to to government is	Role of technology and government in use of m-payment

	Government Regulations on Effective Operations of m-Payment in Kenya		Muli (2013)	major hinderance in developing country like Kenya for m-payments	
12	Biometric Electronic Wallet for Digital Currency	International Journal of Research in Engineering and Technology	Suhas M S, Abhilash C B, Vikas K C and Amit Pareek (2014)	There is need for biometric electronic wallet to store and transfer digital currencies for higher security.	This research helped me understand the future possibilities of digital wallets and how a safe digital wallet could be given to clients.

## 2.3 Research Gap

### 2.3.1 Major Research Gaps

Based on the literature review done, following major research gaps were observed:

- Not much research has been done on merchant adoption in India
- Research considering more than one stakeholders or more than one elements of ecosystem is rare in Indian context.
- Plenty of research has been done on the concept of intension to adopt and not considering the actual acceptance.
- Cross city research in same the country has not done in India
- Legal, regulatory and standardization issues on various stake holders has not been rarely studied.
- Ample research done on model formulation based on TAM and its succeeding variations such as TRA, UTAUT, TPB, DTPB

- There is no study studying the advantages and disadvantages of various mobile payments available in India.
- Target population of most of the researchers were youths i.e. university and college students.
- Gaps in terms of factors that are not properly dealt
  - Changing commercial environment
  - Social and cultural environment

### **2.3.2 Research Gaps Considered for This Research**

There is a major gap in the merchant adoption area as in India there has not been much research covering the merchant adoption issues so the merchant aspect needs to be paid attention.

- There has not been much study covering the merchant adoption of mobile payment system. Therefore, this study tries to cover merchant aspect too.
- Maximum researchers in the past, have concentrated on the adoption intension not focusing on the actual usage of mobile payment system by merchants and consumers. Therefore, this research study primarily aims at studying the actual usage level rather than the adoption intension.
- Very little importance has been given to tier II cities for this topic. Here in India where we see that small village like Adodara is going cashless, alarming us that its high time we focus on tier II cities and towns not just keeping our research confined to metro cities. Therefore this study considers tier II city like Ranchi for this study.

## **2.4 Summary**

This chapter has reviewed many available researches on m-payment, e-payment, mobile/net banking and various technology-based payment systems



of both consumer and merchant adoption. The researches were reviewed from countries and cities all over the world. Various factors were considered suitable for our own research, and hence the researcher decided to study them in their own research.

Various theories given by researchers since the past decades which were related to adoption research were also studied. Research reviews done by past researchers were also studied. Based on the literature reviewed, research gaps were identified.

# **CHAPTER 3: RESEARCH METHDOLOGY**

# **CHAPTER 3: RESEARCH METHDOLOGY**

## **3.1 Overview**

This chapter deals with the complete research plan consisting of research question arising out of the research problem and formulation of research objective from the research questions. Further to meet the objectives, research hypothesis is formulated and tested. This chapter describes about the research methodology adopted in this research in detail. Research methodology is a blueprint to solve the research problem. Therefore, research methodology not only talks about the research methods to be used but also the rationale behind selecting the method in the context of research study, explaining why a particular method or technique is used so that research results are capable of being evaluated either by the researcher himself or by others (Kothari and Garg, 2014). The research methodology is different from research methods or technique. Various methods or techniques adopted by the researchers in their research operations are referred as research methods.

The discussion in this chapter will throw light on the research design, source of data, sampling design, research instruments opted for data collection, and analysis tools used for analysis. The purpose of this study is to analyze the factors that influence consumers' and merchants' adoption of mobile payment system in Ranchi and Kolkata cities. The research study is based on descriptive research design.

### **3.2 Research Question**

- a) What is the acceptance level of mobile payment systems among the merchant and consumers in India?
- b) What is the frequency and usage level of mobile payment system?
- c) Is there any difference in the level of awareness and usage of the mobile payment system among both consumers and merchants of Ranchi and Kolkata?
- d) What is the effect of demographic factors on the level of awareness and use of the mobile payment system for both merchants and consumers?
- e) How positively do usefulness, ease of use, government initiatives, social influence, consumer influence and application providers affect the continued use of mobile payment?
- f) What are the obstacles faced by merchants and consumers while using mobile payment systems? What are the reasons of not using mobile payment?

### **3.3 Statement of the Problem**

Technology has driven the Indian society in the recent past (Singh et al., 2017) and so has the use of mobile phones and its services increased by the Indians (Pal et al., 2019). Mobile payment system surged in India after demonetisation, still mobile payment system has not attained the growth it was expected to (Sinha et al., 2018). So, there is a need for a fresh study to see if still there is a low adoption of mobile payment systems in India or not.

Most of the previous researchers have examined the same variables for their study such as perceived usefulness, perceived ease of use, social influence etc. These factors have proved to be important predictors of adoption intention but

we also need to study new variables for payment research. So, this research adds new variables by taking government initiatives and application providers for this study.

The success of the mobile payment system depends on its acceptance by both merchants and consumers simultaneously. Merchants are the one who acts as the facilitator of the mobile payment services to the consumers whereas consumers are the final end users. So it is vital for the mobile payment service providers like mobile network operators, banks, third party etc to make both the parties accept their service at the same time. Therefore, this study aims at studying the adoption and usage of mobile payment services by both merchant and consumers.

Also doing the literature review (Thakur, 2013; Singh et al., 2017; Sinha et al., 2018) it was found that mobile payment study in India is limited to few region and yet there is hardly any research done in Ranchi region. Further there is lack of comparative study among different states in the mobile payment study field so this study has done a comparative study among Ranchi and Kolkata which is capital of two different states Jharkhand and West Bengal respectively. Both the states have different living standard so, this study is done to see if there is impact of the different standard of living of the people on the use of mobile payment.

### **3.4 Objective of the Study**

Objective of the research is to find the answers to the research questions.

- To study the awareness, adoption and usage of consumer and merchants about mobile payment system
- To find the influence of demographic factors on the awareness and use of mobile payment system.

- To study the impact of other factors that influence consumers and merchants to continue the use of mobile payment system.
- To find out the obstacles faced by merchants and consumers while using mobile payments.

### **3.5 Research Hypotheses**

#### **3.5.1 Definition of Hypothesis**

When a prediction or a hypothesis relationship is to be tested by scientific methods, it is termed as research hypothesis. The research hypothesis is a predictive statement that relates an independent variable to a dependent variable (Kothari and Garg, 2014).

##### **3.5.1.1 Hypotheses for Consumer**

###### **Demographics Variables**

Demographic factors such as age, gender, income, occupation, and qualification have shown to have significance importance on adoption and usage of technology. Many previous researchers such as Venkatesh et al. (2003), Dahlberg and Oorni (2007), Alafeef et al. (2011) Chang and Chong (2013), Kabata (2015), have revealed that demographic factors have significance role on the adoption and usage decision.

Therefore, this study has considered impact of demographic variables on the awareness and use of mobile payment. The various hypotheses formulated on demographic variables is given below.

###### **1. City**

H<sub>0</sub>1a-There is no association between the awareness about the mobile payment system and city of the consumer

H<sub>1</sub>1a-There is association between the awareness about the mobile payment system and city of the consumer

H<sub>0</sub>1b-There is no association between the use of mobile payment system and city of the consumer

H<sub>1</sub>1b-There is association between the use of mobile payment system and city of the consumer

H<sub>0</sub>1c-There is no significant difference in the continued use of mobile payment system and city of the consumer

H<sub>1</sub>1c- There is significant difference in the continued use of mobile payment system and city of the consumer

## 2. Gender

H<sub>0</sub>2a-There is no association between the awareness about the mobile payment system and gender of the consumer

H<sub>1</sub>2a –There is association between the awareness about the mobile payment system and gender of the consumer

H<sub>0</sub>2b-There is no association between the use of mobile payment system and gender of the consumer

H<sub>1</sub>2b-There is association between the use of mobile payment system and gender of the consumer

H<sub>0</sub>2c-There is no significant difference in the continued use of mobile payment system and gender of the consumer

H<sub>1</sub>2c-There is no significant difference in the continued use of mobile payment system and city of the consumer

### 3. Age

H<sub>0</sub>3a-There is no association between the awareness about the mobile payment system and age of the consumer.

H<sub>1</sub>3a-There is association between the awareness about the mobile payment system and age of the consumer.

H<sub>0</sub>3b-There is no association between the use of mobile payment system and age of the consumer.

H<sub>1</sub>3b-There is association between the use of mobile payment system and age of the consumer.

H<sub>0</sub>3c-There is no significant difference in the continued use of mobile payment system and age of the consumer.

H<sub>1</sub>3c-There is significant difference in the continued use of mobile payment system and age of the consumer.

### 4. Educational Qualification

H<sub>0</sub>4a-There is no association between the awareness about the mobile payment system and educational qualification of the consumer.

H<sub>1</sub>4a-There is association between the awareness about the mobile payment system and educational qualification of the consumer.

H<sub>0</sub>4b-There is no association between the use of mobile payment system and educational qualification of the consumer.

H<sub>1</sub>4b-There is association between the use of mobile payment system and educational qualification of the consumer.

H<sub>0</sub>4c-There is no significant difference in the continued use of mobile payment system and educational qualification of the consumer.

H<sub>1</sub>4c-There is significant difference in the continued use of mobile payment system and educational qualification of the consumer.



## 5. Occupation

H<sub>0</sub>5a-There is no association between the awareness about the mobile payment system and occupation of the consumer.

H<sub>1</sub>5a-There is association between the awareness about the mobile payment system and occupation of the consumer.

H<sub>0</sub>5b-There is no association between the use of mobile payment system and occupation of the consumer.

H<sub>1</sub>5b-There is association between the use of mobile payment system and occupation of the consumer.

H<sub>0</sub>5c-There is no significant difference in the continued use of mobile payment system and occupation of the consumer.

H<sub>1</sub>5c-There is significant difference in the continued use of mobile payment system and occupation of the consumer.

## 6. Income

H<sub>0</sub>6a-There is no association between the awareness about the mobile payment system and income of the consumer.

H<sub>1</sub>6a-There is association between the awareness about the mobile payment system and income of the consumer.

H<sub>0</sub>6b-There is no association between the use of mobile payment system and income of the consumer.

H<sub>1</sub>6b-There is association between the use of mobile payment system and income of the consumer.

H<sub>0</sub>6c-There is no significant difference in the continued use of mobile payment system and income of the consumer.

H<sub>16c</sub>-There is significant difference in the continued use of mobile payment system and income of the consumer.

## 7. Personal Innovativeness

H<sub>07a</sub>-There is no association between the awareness about the mobile payment system and personal innovativeness of the consumer.

H<sub>17a</sub>-There is association between the awareness about the mobile payment system and personal innovativeness of the consumer.

H<sub>07b</sub>-There is no association between the use of mobile payment system and personal innovativeness of the consumer.

H<sub>17b</sub>-There is association between the use of mobile payment system and personal innovativeness of the consumer.

H<sub>07c</sub>-There is no significant difference in the continued use of mobile payment system and personal innovativeness of the consumer.

H<sub>17c</sub>-There is significant difference in the continued use of mobile payment system and personal innovativeness of the consumer.

## Other Variables

Usefulness was found to be one of the most significant factors in technology adoption research. Various researchers Nguyen et al (2016); Kabata (2015); Yan & Yang (2015); Padashetty & Kishore (2013); Ahrenstedt et al (2015); Li et al (2014); Lesa & Tembo (2016); Mbogo (2010); Daştan & Gürler (2016); Phonthanukitithaworn et al (2015); Luna et al (2017); Chandrasekhar (2017); Hamza & Shah (2014) have considered usefulness as a vital factor for mobile payment adoption.

## 8. Usefulness

H<sub>0</sub>8- Usefulness will not significantly influence the continued use of mobile payment system by the consumer.

H<sub>1</sub>8- Usefulness will significantly influence the continued use of mobile payment system by the consumer.

Varoious researcher in past such as Kabata (2015); Yan & Yang (2015); Yakubu (2012); Dahlberg and Mallat (2002); Perera (2007); Peng et al (2012); Ahrenstedt et al (2015); Lesa & Tembo (2016); Mbogo (2010); Daştan & Gürler (2016); Phonthanukitithaworn et al (2015); Hamza & Shah (2014); Ayodele et al (2013) have found ease of use to be an influencing factor for mobile payment adoption

#### 9. Ease of Use

H<sub>0</sub>9-Ease of Use will not significantly influence the continued use of mobile payment system by the consumer.

H<sub>1</sub>9- Ease of Use will significantly influence the continued use of mobile payment system by the consumer.

Researchers around the globe have considered that adoption decision is influenced by the peers and friends and thus many researchers : Nguyen et al (2016); Kabata (2015); Tossy (2014); Ahrenstedt et al (2015); Li et al (2014); Lesa & Tembo (2016); Phonthanukitithaworn et al (2015); Abrahão et al (2016); Yang et al (2011); Hamza & Shah (2014) have studied the influence of social influence on adoption of mobile payments.

#### 10. Social Influence

H<sub>0</sub>10- Social Influence will not significantly influence the continued use of mobile payment system by the consumer.

H<sub>1</sub>10- Social Influence will significantly influence the continued use of mobile payment system by the consumer.

#### 11. Government Initiatives

H<sub>0</sub>11- Government Initiatives will not significantly influence the continued use of mobile payment system by the consumer.

H<sub>1</sub>11- Government Initiatives will significantly influence the continued use of mobile payment system by the consumer.

#### 12. Application Provider

H<sub>0</sub>12- Application Provider will not significantly influence the continued use of mobile payment system by the consumer.

H<sub>1</sub>12- Application Provide will significantly influence the continued use of mobile payment system by the consumer.

### **3.5.1.2 Hypotheses for Merchant**

#### Demographics

#### 13. City

H<sub>0</sub>13a-There is no association between the awareness about the mobile payment system and city of the merchant.

H<sub>1</sub>13a-There is association between the awareness about the mobile payment system and city of the merchant.

H<sub>0</sub>13b-There is no association between the use of mobile payment system and city of the merchant.

H<sub>1</sub>13b-There is association between the use of mobile payment system and city of the merchant.

H<sub>0</sub>13c-There is no significant difference in the continued use of mobile payment system and city of the merchant.

H<sub>1</sub>13c-There is no significant difference in the continued use of mobile payment system and city of the merchant.

#### 14. Gender

H<sub>0</sub>14a-There is no association between the awareness about the mobile payment system and gender of the merchant.

H<sub>1</sub>14a-There is association between the awareness about the mobile payment system and gender of the merchant.

H<sub>0</sub>14b-There is no association between the use of mobile payment system and gender of the merchant.

H<sub>1</sub>14b-There is association between the use of mobile payment system and gender of the merchant.

H<sub>0</sub>14c-There is no significant difference in the continued use of mobile payment system and gender of the merchant.

H<sub>1</sub>14c-There is significant difference in the continued use of mobile payment system and gender of the merchant.

#### 15. Age

H<sub>0</sub>15a- There is no association between the awareness about the mobile payment system and age of the merchant.

H<sub>1</sub>15a- There is association between the awareness about the mobile payment system and age of the merchant.

H<sub>0</sub>15b-There is no association between the use of mobile payment system and age of the merchant.

H<sub>1</sub>15b-There is association between the use of mobile payment system and age of the merchant.

H<sub>0</sub>15c-There is no significant difference in the continued use of mobile payment system and age of the merchant.

H<sub>1</sub>15c- There is significant difference in the continued use of mobile payment system and age of the merchant.

#### 16. Educational Qualification

H<sub>0</sub>16-There is no association between the awareness about the mobile payment system and educational qualification of the merchant.

H<sub>1</sub>16a-There is association between the awareness about the mobile payment system and educational qualification of the merchant.

H<sub>0</sub>16b-There is no association between the use of mobile payment system and educational qualification of the merchant.

H<sub>1</sub>16b-There is association between the use of mobile payment system and educational qualification of the merchant.

H<sub>0</sub>16c-There is no significant difference in the continued use of mobile payment system and educational qualification of the merchant.

H<sub>1</sub>16c- There is no significant difference in the continued use of mobile payment system and educational qualification of the merchant.

#### 17. Personal Innovativeness

H<sub>0</sub>17a-There is no association between the awareness about the mobile payment system and personal innovativeness of the merchant.

H<sub>1</sub>17a-There is association between the awareness about the mobile payment system and personal innovativeness of the merchant.

H<sub>0</sub>17b-There is no association between the use of mobile payment system and personal innovativeness of the merchant.

H<sub>1</sub>17b-There is association between the use of mobile payment system and personal innovativeness of the merchant.

H<sub>0</sub>17c-There is no significant difference in the continued use of mobile payment system and personal innovativeness of the merchant.

H<sub>1</sub>17c-There is significant difference in the continued use of mobile payment system and personal innovativeness of the merchant.

#### 18. Technology Inclination

H<sub>0</sub>18a-There is no association between the awareness about the mobile payment system and technology inclination of the merchant.

H<sub>1</sub>18a-There is association between the awareness about the mobile payment system and technology inclination of the merchant.

H<sub>0</sub>18b-There is no association between the use of mobile payment system and technology inclination of the merchant.

H<sub>1</sub>18b-There is association between the use of mobile payment system and technology inclination of the merchant.

H<sub>0</sub>18c-There is no significant difference in the continued use of mobile payment system and technology inclination of the merchant.

H<sub>1</sub>18c-There is significant difference in the continued use of mobile payment system and technology inclination of the merchant.

#### Independent Variables

##### 19. Usability

H<sub>0</sub>19-Usability will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>1</sub>19-Usability will significantly influence the continued use of mobile payment system by the merchant.

## 20. Consumer Influence

H<sub>0</sub>20-Consumer influence will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>1</sub>20-Consumer influence will significantly influence the continued use of mobile payment system by the merchant.

## 21. Government Initiatives

H<sub>0</sub>21-Government initiatives will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>1</sub>21-Government initiatives will significantly influence the continued use of mobile payment system by the merchant.

## 22. Application Provider

H<sub>0</sub>22-Application provider will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>1</sub>22-Application provider will significantly influence the continued use of mobile payment system by the merchant.

### **3.6 Research design**

Research design is a framework or blueprint for conducting the research project (Malhotra and Dash, 2011). It is the detail of all the necessary steps taken to obtain the information required to solve the research problem. A research design is the arrangement of conditions for collection and analysis of data in manner that aims to combine relevance to the research purpose with economy in procedure (Kothari and Garg, 2014).

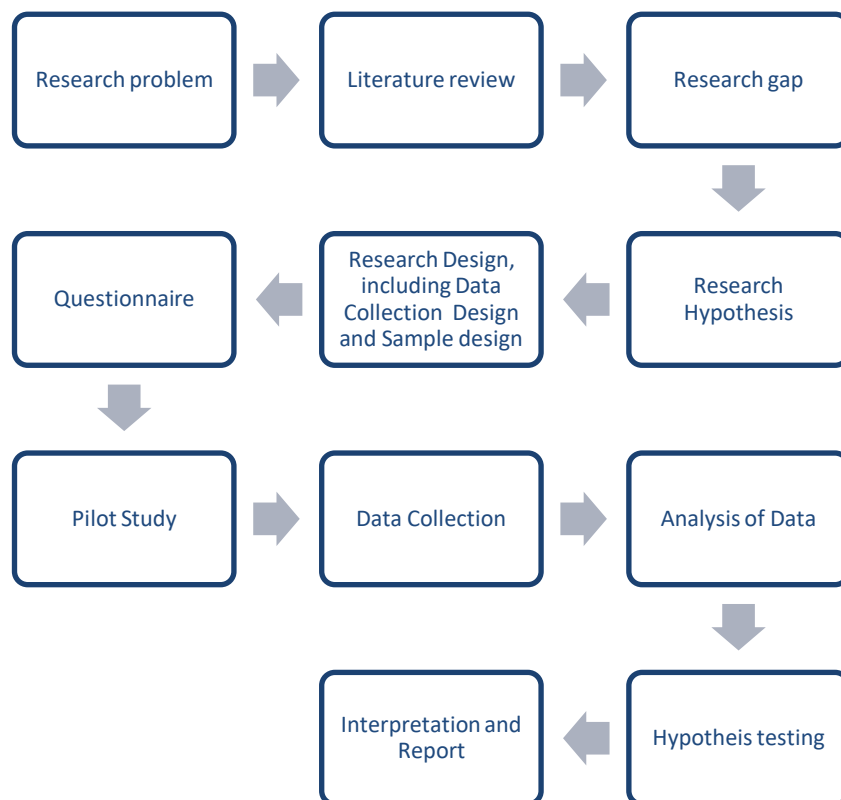
Descriptive research is a type of conclusive research which is concerned with describing the characteristics of particular individual or a group (Kothari and Garg, 2014). A descriptive design requires a clear specification of the who,



what, where, why, way and how (the six Ws) of the research (Malhotra and Dash, 2011). This study is concerned with finding out the factors that influence use of mobile payment among merchants and consumers and also the study tries to describe the characteristics of consumers and merchants, therefore, this research is descriptive in nature.

### 3.6.1 Research Process

**Figure 3.1: Flow chart of research process (Source: Kothari & Garg, 2014)**



Research process consists of various steps required to execute the research effectively (Kothari and Garg, 2014), such as understanding the research problem, reviewing the previous literature to gain insights about the topic and to find the research gap, formulating a proper research design, collecting data, analyzing the responses from the collected data, and finally interpreting and reporting the results.

### **3.6.2 Research Approach**

Many researchers have tried to review and classify research approaches in the IR (information research) area. The research approach can be classified into two basic types – Quantitative approach and Qualitative approach (Kothari and Garg, 2014). Quantitative research approach is used when there are clearly defined variables to be examined. A quantitative research approach will need quantitative research design (Grover, 2015). Qualitative research is used to explore and understand how people experience in a given research issue. It is effective when the researcher needs to identify intangible factors, such as social influence, socioeconomic status, gender roles, city, and religion (Mack et al., 2005). Mixed method is a new research approach advanced by Creswell (2009), which involves mix of both qualitative and quantitative approach to collect the data.

Quantitative research emphasises on gathering data which can be quantified or expressed in terms of numbers (Goundar, 2012). According to Creswell, quantitative research first needs a literature review to arrive at the research problem and to develop a theory or hypotheses. Survey is one of the main tool used in quantitative research to obtain data (Creswell, 2014: Goundar, 2012 ).

This research study has applied quantitative research method. Literature review was done to arrive at the variables for this study. Survey method was opted to gather primary data using the paper – based questionnaire. All the data were analysed using statistical test.

### **3.6.3 Research Method**

Research method is often misunderstood as research methodology. Research method is part of research methodology which deals with various procedures by which research is performed into a subject or a topic (Goundar, 2012). Research methods comprises of three things- Methods by which data is collected, Statistical techniques used to analyze the data, and methods to evaluate the accuracy of the results (Kothari and Garg, 2014). Majority of IS research uses surveys, interviews, experiments and case studies as the pre-dominant research methods (Choudhrie and Dwivedi, 2005), whereby most used method is survey followed by case studies. This study used survey as the research method.

Survey – Survey is one of the major methods used in descriptive research. It is defined as the process of obtaining desired information from the sample population through a well structured questionnaire (Malhotra and Dash, 2011). Survey is used in both types of research approaches Quantitative and Qualitative. Survey data tends to be reliable as the responses are generally restricted to the alternatives stated. Survey can be collected through several methods such as face to face interviewing, telephone interviewing, mail interviewing and electronic interviewing. Survey method has been opted by plethora of researchers in the context of mobile payment (Diniz et al., 2011; Mondego and Gide, 2018). Many mobile payment researchers such as Dahlberg (2007), Kim et al. (2010), Liebana-Cabanillas (2014), Shaw (2014) etc. have opted survey method to obtain the data. This study too has used questionnaire as the survey tool to collect the data for pilot and main study. For the pilot study, apart from personally distributing the questionnaires to the respondents, web based questionnaire by the use of google forms were also sent to the respondents.

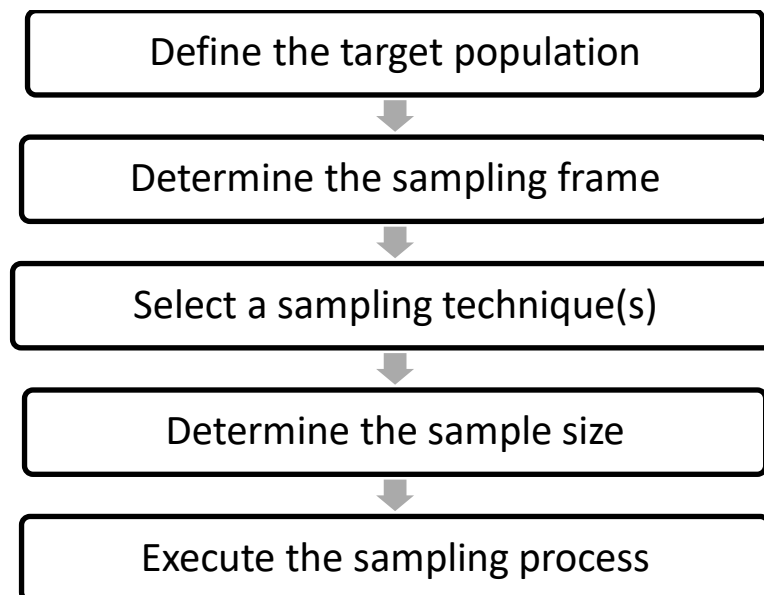
### 3.7 Population

All the items under consideration in any field of enquiry constitute a ‘universe’ or ‘population’. A complete enumeration of all the items in the ‘population’ is known as a census enquiry (Kothari and Garg, 2014). Population for the study is divided into two major categories:- Consumers and Merchants.

#### 3.7.1 Sampling Design

Sample design is a well defined plan used by researcher to obtain a sample from the selected population for the study (Kothari and Garg, 2014).

**Figure 3.2: Flow chart of sampling design (Source: Kothari and Garg, 2014)**



The target population for the study was grouped into four set of people as follows:

1. Ranchi consumers

2. Kolkata consumers
3. Ranchi retail merchants
4. Kolkata retail merchants

### 3.7.2 Sampling Unit and Frame

Sampling frame is a representation of the element of the target population (Malhotra and Dash, 2011). Consumers above the 15 years of age were considered for this study, whereas, in case of merchants only retailers were considered. Sample unit for this study is any individual consumer and individual merchant of Ranchi and Kolkata (capital city of Jharkhand and West Bengal respectively).

The respondent will be categorized into two categories-

1. The users (one who are using mobile payment system)
2. The non users (one who are not using the payment system)

### 3.7.3 Sampling Technique

For getting diversified sample, the consumers and merchants were contacted from major areas of both Ranchi and Kolkata cities. Further convenient sampling technique was used to get the data from those selected areas. Ten most famous hotspots for consumer availability were considered in this case and densely populated retail market areas were visited for data collection.

**Table 3.1: Data collection from area of Ranchi and Kolkata**

City	Area covered
Kolkata	<ul style="list-style-type: none"> <li>• Gariahat Market</li> <li>• College Street</li> </ul>

	<ul style="list-style-type: none"> <li>• Hatibagan Market</li> <li>• South City Mall</li> <li>• Mani Square Shopping Mall</li> <li>• Avani Riverside Shopping Mall</li> <li>• Burrabazar Market</li> <li>• Chowringhee Road</li> <li>• Quest Mall</li> <li>• Dakshinapan Shopping Center</li> </ul>
Ranchi	<ul style="list-style-type: none"> <li>• Nucleus Mall, Ranchi</li> <li>• Sector market, Dhurwa</li> <li>• Club complex, Ranchi</li> <li>• Doranda market, Ranchi</li> <li>• Hatia market, Ranchi</li> <li>• Kutchery market</li> <li>• Ratu road</li> <li>• Harmu</li> <li>• Main road</li> <li>• Namkum</li> </ul>

#### 3.7.4 Sample size

Total sample size considered for this study is 600, with 300 respondents each from Ranchi and Kolkata city. Further, 300 respondents are divided among consumers and merchants in the ratio of 2:1.

To calculate our sample size, we have used Slovin's formula. The formula is described as

$$n = N / \{ 1 + N(e)^2 \}$$

Here, n= sample size

N= total population

e= margin of error

The population of Ranchi is 13,09,860 and that of Kolkata is 44,96,694, so total population (N)= 58,06,554 and we have taken 5% as margin of error (e).

$$n = 5806554 / (1 + 5806554 * 0.05^2)$$

$$n = 5806554 / 14517.4$$

$$n = 399.98$$

So, we get sample size (n) as 400 after rounding off.

We have taken total sample size as 600 as population size is large, dividing it into two categories i.e., Consumers and Merchants, in the ratio of 2:1, wherein we will be covering 200 consumers and 100 merchants from each city.

Out of 200 respondents from Ranchi there were 129 users and 71 non users. While out of 200 respondents from Kolkata there were 144 users and 56 non users.

For merchants 100 respondents from each city, there were 58 users from Ranchi and 74 users from Kolkata, whereas 31 non users from Ranchi and 13 non users from Kolkata, while 11 were the one who abandoned using mobile payment in Ranchi and 13 abandoned mobile payment in Kolkata.

### **3.8 Data Collection**

#### **3.8.1 Data Collection Method and Technique**

- Primary data: The data which are collected afresh and for the first time, and thus happen to be original in character (Kothari and Garg, 2014).

- Secondary data: The data which have already been collected by someone else and which have already been passed through the statistical process (Kothari and Garg, 2014).

For any research, data is either collected afresh or previously acquired data or information is used to gain a new insight out of it. In this research both primary and secondary data is used for the accomplishment of the research objectives. First and foremost secondary data was used in form of existing online publications like research papers, articles, survey reports, research thesis etc. to gain the insight over the topic. Deeper knowledge was gained on the factors having impact on mobile payment acceptance, methodology used in the mobile payment research and analysis techniques to be payment system adopted. Then primary data was used to get the required information to test the research hypothesis. Primary data can be collected through – observation method, interviews, questionnaire and schedules. Data for this research was collected through survey method from respondents. Questionnaire was selected as the research data instrument to gather the information from the respondents.

### **3.8.2 Research Data Collection Instrument**

Questionnaire being the vital part of research design is treated as the heart of the survey method (Kothari & Garg, 2015). Questionnaire was preferred for this research as it is most organized instrument to get the responses out of respondents. Questionnaire was used being economical and effective way to get responses. A well designed questionnaire is very important for the survey (Bhattacharjee, 2012). Questionnaire in English language was formulated with easy understandable words. Questionnaire design consisted of three sections. The first section dealt with the demographic characteristics of the individuals like gender, age, qualification, occupation and income. Second section of the questionnaire is regarding the perception of the respondent



about the mobile payment system and third is regarding their personal responses such as name, contact number. Questionnaire consisted questions of multiple choice, dichotomous questions and scaled questions. Five point Likert scale was used in the questionnaire on a scale of 1-5 ranging from strongly disagree to strongly agree.

### **3.9 Pilot Study**

Pilot study is a small scale study done to test research methodology intended to be used for a larger study (Kim, 2010; Zailinawati et al., 2006). Pilot study is very vital in the research process, as it is done to find out the issues in the research instrument and research protocol, and allows any kind of change in the main study to be done the researcher (Kim, 2010; Zailinawati et al., 2006). Pilot study was done before the final study to find if there was any drawback in the questionnaire and if there existed any problem faced by the respondents in filling the questionnaire and the researcher during the pilot survey. For this, pilot survey was done through a proper questionnaire which was designed to meet the research objectives. Data for the pilot survey was obtained from 50 consumers and 30 merchants, each from Kolkata and Ranchi.

A total of 40 items for consumers were asked which comprised of demographic, likert scale, usage information etc. Similar questionnaire was designed for merchants with total of 46 items. Questionnaire was distributed in-person to both the consumers as well as to the merchants. Respondents for the pilot study were taken from all age groups and, also both males and females were included for data collection to get a diversified response. Questionnaire format for both consumer and merchant are given below.

**Table 3.2: Questionnaire of consumer pilot survey**

<b>Consumers Pilot Survey Questionnaire</b>		
<b>Q.No.</b>	<b>Parameters</b>	<b>Type of Questions</b>
1	Native of the city	Demographics
2	Gender	Demographics
3	Age	Demographics
4	Marital status	Demographics
5	Family type	Demographics
6	Educational qualification	Demographics
7	Occupation	Demographics
8	Income	Demographics
9	Do you use smartphone	Usage info
10	How comfortable are you with smart phone	Usage info
11	Do you use mobile internet	Usage info
12	How often do you use mobile internet	Usage info
13	Awareness about mobile payment systems	Usage info
14	Installation of application	Usage info
15	Use of mobile payment	Usage info
16	Reason for not using	Usage info
17	Use if problems solved	Usage info
18	Ranking of feature used in smartphone	Usage info
19	Preference of payment	Usage info
20	Installation of applications	Usage info
21	Performance rating of applications	Usage info
22	Time since mobile payment systems use	Usage info
23	Purpose of mobile payment	Usage info
24	Frequency of mobile payment	Usage info

25	Expenditure through mobile payment	Usage info
26	How much mobile payment systems expenditure done instead cash	Usage info
27	How much mobile payment systems expenditure done instead card	Usage info
28	Ratio of card to cash usage	Usage info
29	Loading of mobile wallet	Usage info
30	Usefulness of mobile payment	Factors of use
31	Ease of use of mobile payment	Factors of use
32	Social influence related to mobile payment	Factors of use
33	Security concern	Factors of use
34	Government initiatives in mobile payment	Factors of use
35	Application providers role	Factors of use
36	Factor rating for use of mobile payment systems	Factors of use
37	Personal innovativeness	Others
38	City enthusiasm	Others
39	Problems in use of mobile payment systems	Others
40	Suggestion	Others

**Table 3.3: Questionnaire of merchant pilot survey**

<b>Merchants Pilot Survey Questionnaire</b>		
<b>Q.No.</b>	<b>Parameters</b>	<b>Type of Questions</b>
1	Nature of business	Demographics
2	Gender	Demographics
3	Age	Demographics

4	Marital status	Demographics
5	Family type	Demographics
6	Educational qualification	Demographics
7	Occupation	Demographics
8	Turnover	Demographics
9	Do you use smartphone	Usage info
10	How comfortable are you with smart phone	Usage info
11	Do you use phone for business promotion	Usage info
12	Do you use mobile internet	Usage info
13	How often do you use mobileinternet	Usage info
14	Awareness about mobile payment systems	Usage info
15	Installaton of application	Usage info
16	Use of mobile payment	Usage info
17	Reason for not accepting	Usage info
18	Percent of consumer demand for not accepting	Usage info
19	Use if problems solved	Usage info
20	Ranking of feature used in smartphone	Usage info
21	Preference of payment	Usage info
22	Installation of applications	Usage info
23	Time since mobile payment systems use	Usage info
24	Frequency of mobile payment	Usage info
25	Expenditure through mobile payment	Usage info
26	How much mobile payment systems transaction done instead cash	Usage info
27	How much mobile payment systems	Usage info

	transaction done instead card	
28	Ratio of card to cash transaction	Usage info
29	Is mobile payment necessity for e commerce	Usage info
30	Performance rating of applications	Usage info
31	Purpose of mobile payment	Usage info
32	Monthly sales through mobile payment	Usage info
33	Do you have to assist consumers in mobile payment systems	Usage info
34	Do you encourage consumer to pay through mobile payment systems	Usage info
35	Will you use mobile payment systems more if business promoted	Usage info
36	Usefulness of mobile payment	Factors of use
37	Ease of use of mobile payment	Factors of use
38	Social influence related to mobile payment	Factors of use
39	Security concern	Factors of use
40	Government initiatives in mobile payment	Factors of use
41	Application providers role	Factors of use
42	Factor accepting use of mobile payment systems	Factors of use
43	City enthusiasm	Others
44	Most important in success of mobile payment systems	Others
45	Problems in use of mobile payment systems	Others
46	Suggestion	Others

### 3.9.1 Results from Pilot Survey

Reliability test was done to check the internal consistency among the variables. All the variables for both merchants and consumers had Cronbach's alpha value of more than 0.7 which indicates good internal consistency among the constructs of the variables. The tables depicting Cronbach's alpha value are shown below.

**Table 3.4: Cronbach's value for consumers' pilot survey**

Consumer	Usefulness	Ease of use	Social influence	Government initiative	App provider	Merchant
Kolkata	.717	.852	.795	.849	.720	.731
Ranchi	.779	.730	.796	.637	.781	.711

**Table 3.5: Cronbach's value for merchants' pilot survey**

Merchant	Usefulness	Ease of use	Competition	Consumer	App provider	Government initiative	Technical	Cost
Kolkata	.716	.847	.967	.897	.778	.797	.765	.946
Ranchi	.887	.960	.925	.728	.814	.890	.772	.725

### 3.9.2 Final Survey Questionnaire

Questionnaire for the final study were distributed to consumers and merchants personally and they were made to fill in front of the researcher so that in case

of any query researcher could assist the respondents. While majority of respondents faced no difficulty in filling the responses, there were some consumers for whom the researcher had to brief the questions and then they filled their responses. Also, there were few merchants who due to lack of time insisted the researcher to fill the questionnaire for them as per the responses given by them. Final questionnaire was reduced in length after pre-testing the questionnaire as the questionnaire was bit lengthy and time taking for the respondents.

The changes made in the questionnaire are summarized below

- A) Survey reports were reduced considering the long time taken by the respondent and many respondents were not willing to complete the questionnaire. Many respondent submitted incomplete questionnaire leaving questions of the end unanswered. Also considering the fact that the respondent were in a hurry or busy while filling the questionnaire, the questionnaire had to be short.
- B) As there were maximum incomplete questionnaire in the pilot survey so it was decided to only go for the offline mode of questionnaire for the main survey.
- C) The variables were reduced from 7 to 5
- D) For better understanding certain vocabulary was changed.

### **3.10 Summary**

This chapter has described research methodology and research design followed to get the desired results. The justifications of the choices made for factors, variables, sample size and data collection methods have been given briefly. The result of the pilot study has been presented and the changes made in the final questionnaire were documented. The analysis of the data thus collected has been given in the next chapter.

# **CHAPTER 4: DATA ANALYSIS AND INTERPRETATION**



# CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

## 4.1 Introduction

This chapter deals with the analysis of the data collected from the consumers and merchants to test the hypothesis formulated. The chapter begins with the reliability analysis followed by factor analysis, regression coefficients etc. Various analysis test used were Chi-square, independent sample t-test, one way ANOVA, regression, which are discussed in detail in the subsequent part of the chapter.

## 4.2 Consumer Analysis and Interpretations

### 4.2.1 Demographic Profile of the Respondents

**Table 4.1: Demographic profile of the consumers**

Characteristics	Profile	Ranchi		Kolkata		Total frequency
		Frequency	Percent	Frequency	Percent	
Gender	Male	137	68.5	128	64	265
	Female	63	31.5	72	36	135
Age group	15 to 25yrs	61	30.5	64	32	125
	26 to 40yrs	99	49.5	101	50.5	200
	41 to 60yrs	28	14	27	13.5	45
	Above 60yrs	12	6	8	4	20

Education	Below intermediate	8	4	12	6	20
	Intermediate	29	14.5	25	12.5	54
	Graduate	116	58	126	64	242
	PG & above	47	23.5	37	18.5	84
Occupation	Student	40	20	34	17	74
	Businessman	34	17	47	23.5	81
	Occupational	21	10.5	24	12	45
	Government employee	26	13	14	7	40
	Private employee	57	28.5	55	27.5	112
	Housewife	14	7	16	8	30
	Unemployed	8	4	10	5	18
Income	Below Rs. 10k	69	34.5	72	36	141
	Rs. 10k to 30k	54	27	50	25	104
	Rs. 30k to 50k	36	18	33	16.5	69
	Rs. 50k to 1 lakh	28	14	32	16	60
	Above Rs. 1 lakh	13	6.5	13	6.5	26
When a new technology is introduced in the market	I am usually among the first to use	63	31.5	44	22	107

	I wait for others to use first	69	34.5	94	47	163
	I am among late users	49	24.5	41	20.5	90
	I prefer using old technology only	19	9.5	21	10.5	40

The above table depicts that in Ranchi 68.5% of respondents are male and 31.5% are female respondents. In case of the age of the respondents, the table shows that 49.5% in the age group of 26 to 40 yrs, followed by 30.5% of respondents are in the age groups of 15 to 25 yrs, 14% in the age group 41 to 60 yrs and only 6% are in the age group of above 60. Regarding the education of the respondents, 58% had completed graduation, 23.5% had PG & above degrees, 14.5% of the respondents had done intermediate, and only 4% were below intermediate. In respect of occupation, 28.5% were private employee, 27.5% were in business /professionals, 20% were students, 13% were government employees, and 11% were housewife/unemployed. About the income of the respondents, 34.5% had monthly income below Rs. 1000, 27% earned between Rs. 10,001 to 30,000 monthly, 18% earned between Rs. 30,001 and 50,000, 14% earned between Rs. 50,001 to 1lakh and only 6.5% earned above Rs. 1,00,000. For Personal innovativeness findings revealed that 34.5% of respondents waited for others to use first, 31.5% of respondents are among first to use new technology, 24.5% are late users and only 9.5% are the ones who prefer to use old technology.

For Kolkata, 64% of respondents are male and 36% are female respondents. In case of the age of the respondents, the table shows that 50.5% in the age group

of 26 to 40 yrs, 32% of respondents are in the age groups of 15 to 25 yrs, 13.5% in the age group 41 to 60 yrs and only 4% are in the age group of above 60. Regarding the education of the respondents, 64% had completed graduation, 18.5% have PG & above degrees, 12.5% of the respondents had done intermediate, and only 6% are below intermediate. In respect of occupation, 35.5% were in business /professionals, 27.5% were private employee, 17% were students, 13% were housewife/unemployed, and only 7% were government employees. About the income of the respondents, 36% had monthly income below Rs. 1000, 25% earned between Rs. 10,001 to 30,000 monthly, 16.5% earned between Rs. 30,001 and 50,000, 16% earned between Rs. 50,001 to 1 lakh and only 6.5% earned above Rs. 1,00,000. For Personal innovativeness findings revealed that 47% of respondents waited for others to use first, 22% of respondents are among first to use new technology, 20.5% are late users and only 10.5% are the ones who prefer to use old technology.

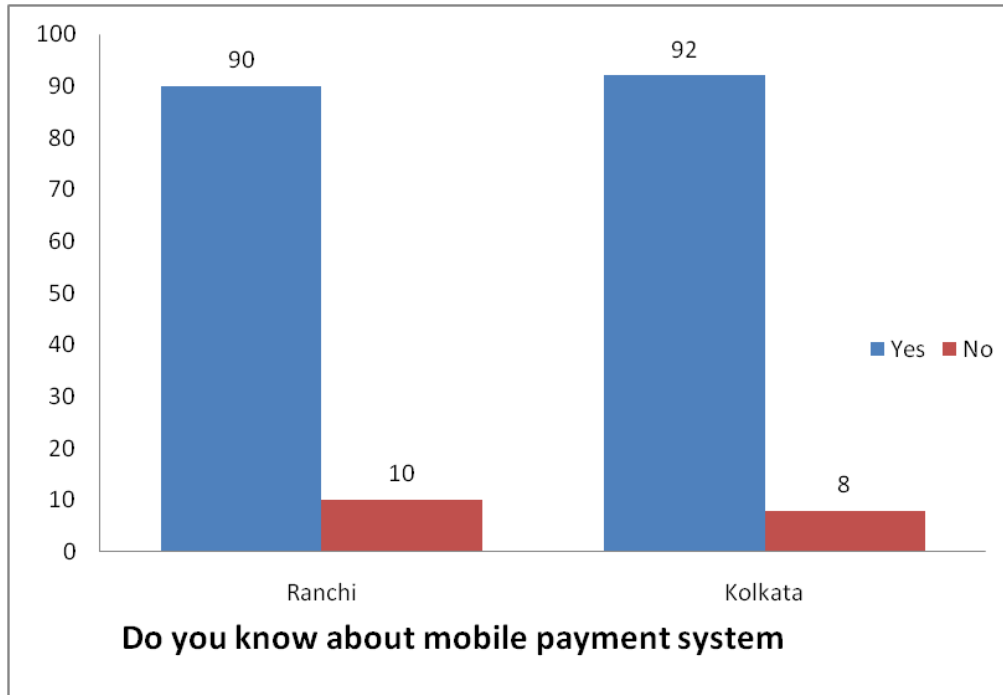
#### **4.2.2 Comparison of Level of Awareness, Adoption and Usage of the Mobile Payment Systems among the Consumers of Ranchi and Kolkata**

##### **4.2.2.1 Awareness about the Mobile Payment Systems among Consumer**

**Table 4.2: Awareness among consumers about mobile payment**

Awareness about mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	180	90%	184	92%
No	20	10%	16	8%
Grand total	200	100%	200	100%

**Figure 4.1: Awareness among consumers about the mobile payment systems**



In case of Ranchi, 90% of the total respondents are aware about mobile payment system and only 10% of the respondents do not know about Mobile Payment Systems.

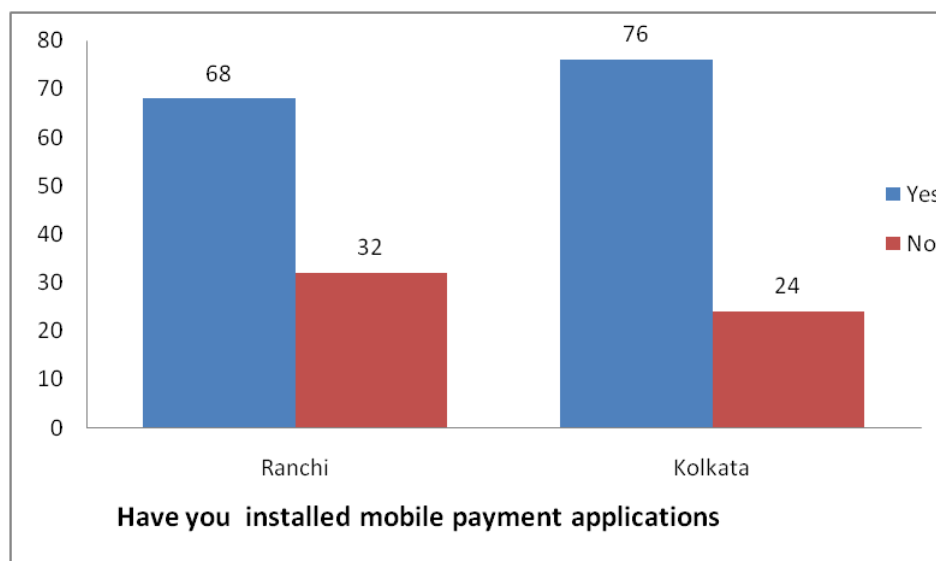
Whereas, in case of Kolkata 92% of the total respondents are aware about mobile payment system and only 8% of the respondents do not know about Mobile Payment Systems .

#### 4.2.2.2 Installation of mobile payment applications by the consumer

**Table 4.3: Installation of mobile payment applications by consumer**

Mobile payment applications installed	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	137	68%	152	76%
No	63	32%	48	24%
Grand total	200	100%	200	100%

**Figure 4.2: Installation of mobile payment application by consumers**



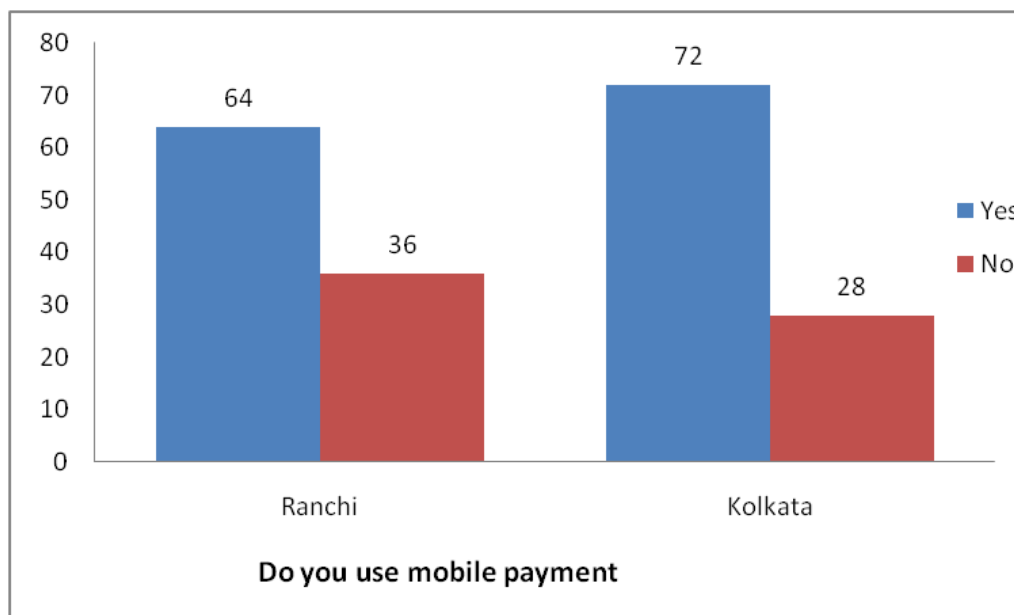
Out of the total respondents in Ranchi, 68% have mobile payment application installed in their phone and 32% have not installed mobile payment application in their phone. Whereas, Out of the total respondents in Kolkata, 76% have mobile payment application installed in their phone and 24% do not have mobile payment application installed in their phone.

#### 4.2.2.3 Use of mobile payment systems by consumer

**Table 4.4: Use of mobile payment systems by consumer**

Using mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	129	64%	144	72%
No	71	36%	56	28%
Grand total	200	100%	200	100%

**Figure 4.3: Use of mobile payment systems by consumer**



Out of the total respondents, 64% uses the mobile payment systems and 36% do not use any such payment options in Ranchi. Whereas, Out of the total respondents, 72% uses the mobile payment systems and 28% do not use any such payment options in Kolkata.

Out of total 400 consumers of mobile payment system, 273 were users consisting of 144 from Kolkata & 129 from Ranchi while 127 were non-users comprising of 71 from Ranchi & 56 from Kolkata. This study has not gone into deeper analysis of the non user side. Apart from their demographic profile, only few questions were asked to the non users, analysis of which is done below and the users analysis is done thereafter.

#### 4.2.3 Non Users Data Analysis

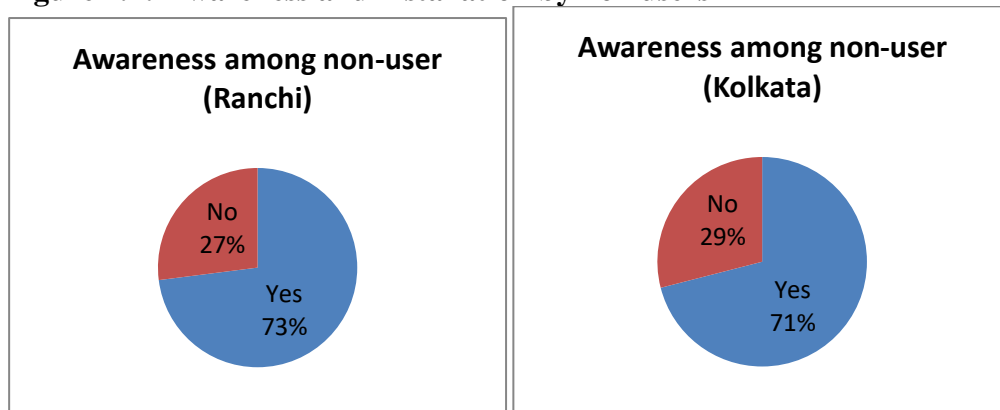
Analysis was done for total of 127 non users which is shown below.

##### 4.2.3.1 Awareness and installation of mobile payment systems by non users

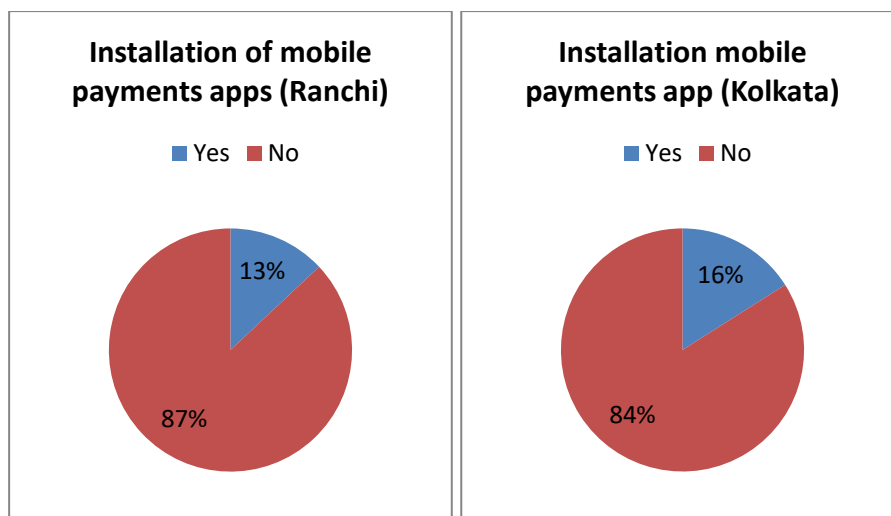
**Table 4.5: Awareness and installation of mobile payment systems by non users**

City	Ranchi				Kolkata			
	Yes		No		Yes		No	
	Frequ ency	Percen tage	Frequ ency	Percen tage	Frequ ency	Percen tage	Frequ ency	Percen tage
Aware ness	52	73%	19	27%	40	71%	16	29%
Install ation	9	13%	62	87%	9	16%	47	84%

**Figure 4.4: Awareness and installation by non users**







In case of Ranchi, 73% of the total non users are aware about mobile payment system and only 27% of the respondents do not know about Mobile Payment Systems. Regarding, installation of payment apps, 87% of non users do not have any such apps installed in their mobile phones while remaining 13% of non users have some kind of mobile payment apps installed in their phones.

Whereas, in case of Kolkata 71% of the total respondents are aware about mobile payment system and only 29% of the respondents do not know about Mobile Payment Systems. Regarding, installation of payment apps, 84% of non users do not have any such apps installed in their mobile phones while remaining 16% of non users have some kind of mobile payment apps installed in their phones.

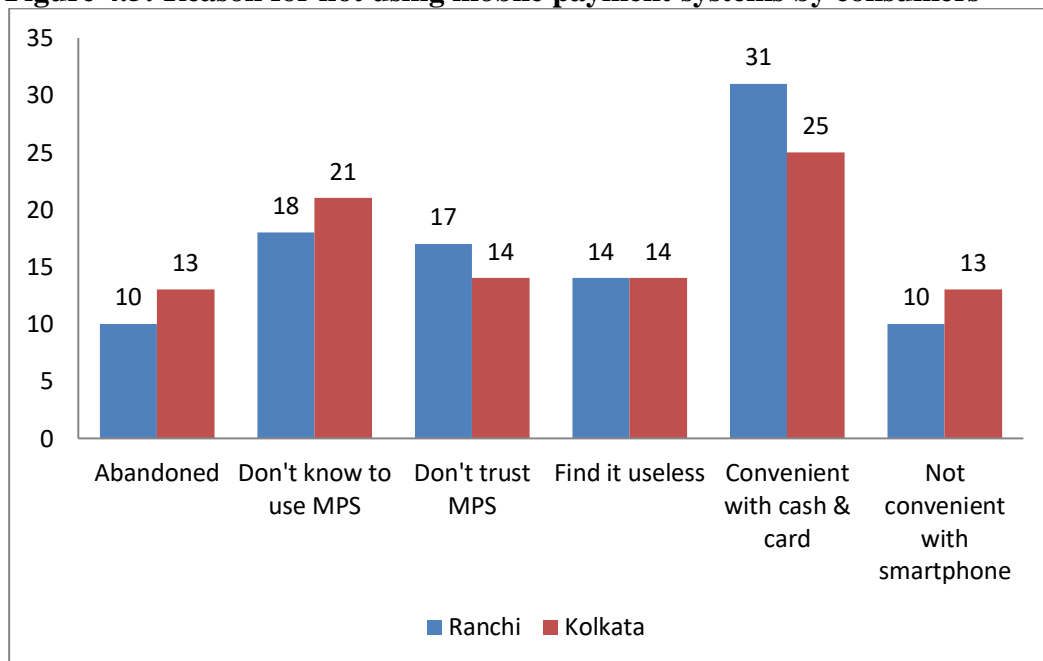
#### 4.2.3.2 Reason for not using mobile payment system

**Table 4.6: Reason for not using mobile payment**

City	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Abandoned	7	10%	7	13%
Don't know	13	18%	12	21%

to use MPS				
Don't trust MPS	12	17%	8	14%
Find it useless	10	14%	8	14%
Convenient with cash & card	22	31%	14	25%
Not convenient with smartphone	7	10%	7	13%
Total	71	100%	56	100%

**Figure 4.5: Reason for not using mobile payment systems by consumers**



Convenience with cash and card is most prominent reason for consumers to not use mobile payment as 31% of users in Ranchi and 25% of users in Kolkata do not use mobile payment due to this. Not knowing how to use is also a concern as 18% of non users in Ranchi have this problem, where as 21% of non users in Kolkata have this issue. Not trusting mobile payment is issue of 14% of non users in Ranchi and for 14% of non users in Kolkata. 14%

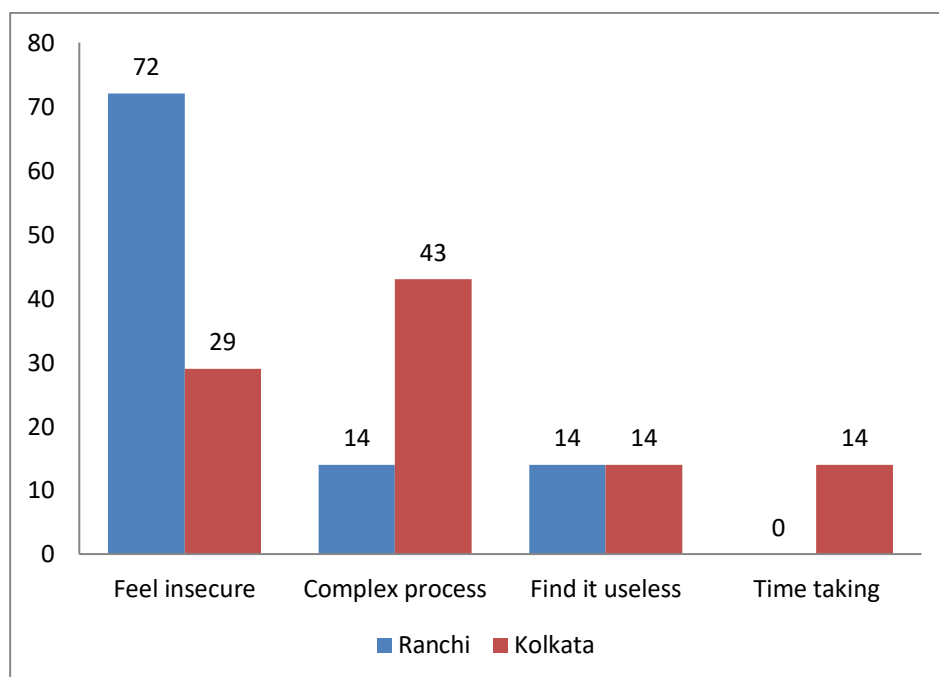
of non users in both city felt that mobile payment is useless. Abandoned and inconvenience with smartphone is the reason for not using for 10% of Ranchi and 13% of Kolkata non users.

#### 4.2.3.3 Reason for abandoning mobile payment systems

**Table 4.7: Reason for abandoning mobile payment systems**

City	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Feel insecure	5	72%	2	29%
Complex process	1	14%	3	43%
Find it useless	1	14%	1	14%
Time taking	0	0%	1	14%
Total	7	100	7	100

**Figure 4.6: Reason for abandoning mobile payment by consumers**



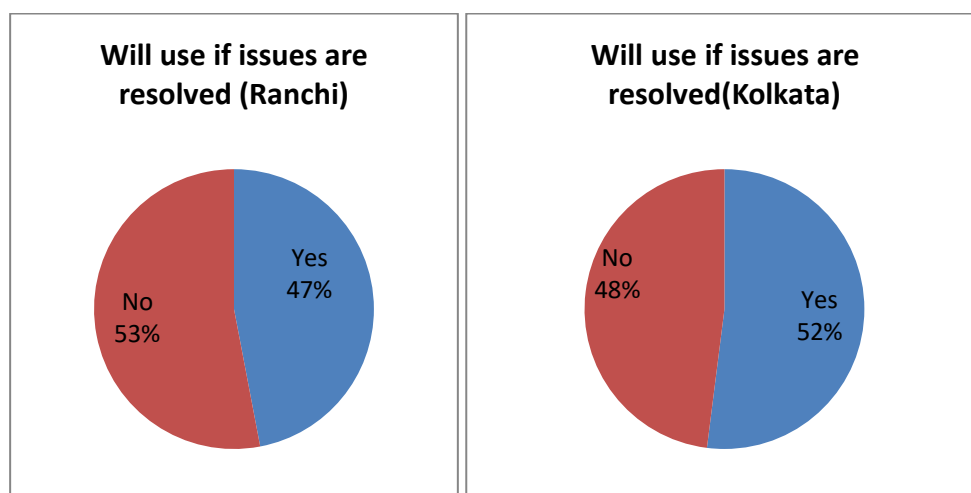
The feeling of insecurity among consumers of Ranchi who abandoned mobile payment system is very high i.e. 72%, as compared to that of Kolkata i.e. 29%. Complexity of process is the most prominent reason for consumers of Kolkata i.e. 43% for abandoning mobile payment system, as compared to 14% in Ranchi. 14% of people who abandoned found it useless in each city. 14% of abandoned users found it time taking in Kolkata, whereas none in Ranchi city felt the same.

#### 4.2.3.4 Possibility of using mobile payment systems in future

**Table 4.8: Possibility of using mobile payment systems**

City	Ranchi		Kolkata	
Possibility	Frequency	Percentage	Frequency	Percentage
Yes	33	53%	29	52%
No	38	47%	27	48%
Total	71	100%	56	100%

**Figure 4.7: Possibility of using mobile payment by consumer**



In case of Ranchi, about 53% of the non users are not willing to use mobile payments even when their issues are solved but 47 % do want to use such payments if their issues are resolved.

Regarding, Kolkata, 52% of the non users are willing to use mobile payments once their issues are solved but 48 % do not want to use any such payments even then.

#### **4.2.4 User Consumer Analysis**

Analysis was done for total of 273 users which is shown below.

##### **4.2.4.1 Ranking of the payment options preferred by consumers**

To know about the preference of Mobile Payment System as payment options among consumer question was asked where respondents were asked to rank their preference from 1 as most preferred to 5 as least preferred. Based on the consumer responses, observation about both the cities is given below.

**Table 4.9: Ranking of payment options among consumers**

<b>Payment option</b>	<b>Ranchi</b>		<b>Kolkata</b>	
	<b>Mean Rank</b>	<b>Rank</b>	<b>Mean Rank</b>	<b>Rank</b>
Cash	2.54	1	2.59	1
Debit card	2.78	2	3.12	3
Credit card	3.48	5	2.89	2
Net banking	3.18	4	3.59	5
Mobile payment	2.98	3	3.24	4

In case of Ranchi consumers, cash is given the first preference for payment method, debit card is preferred next, followed by mobile payment, then net banking and credit card is the least preferred payment method.

In case of Kolkata consumers, cash is given the first preference for payment method, credit card is preferred next, followed by debit card, mobile payments and net banking respectively.

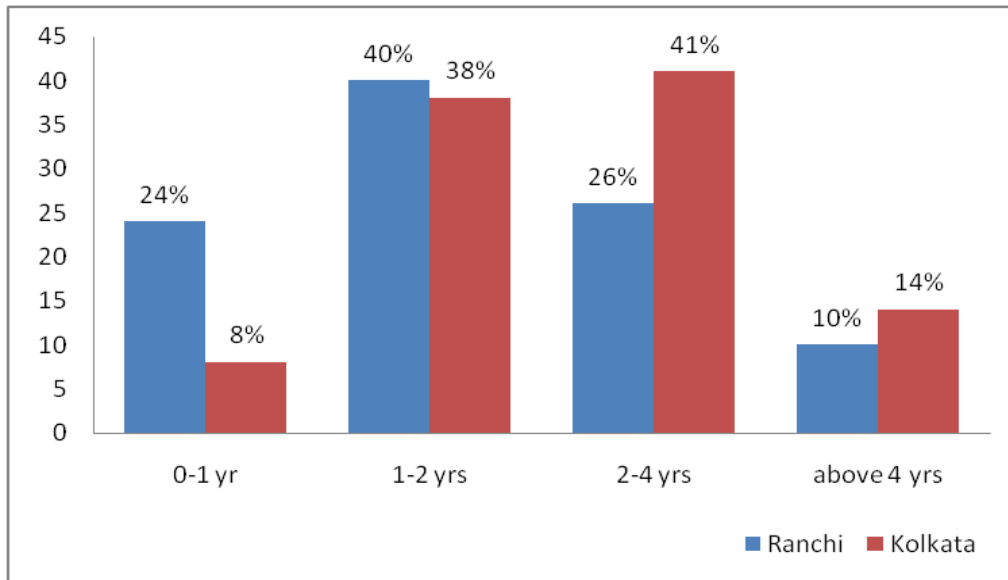
#### **4.2.4.2 Span of using the mobile payment system by consumers**

Question was asked to know about for how long people have been using mobile payments in both the cities where respondents were given select option from below 1 year to above 4 years. The responses from both cities are presented below.

**Table 4.10: Consumers' span of using the mobile payment systems**

<b>Duration of using mobile payments</b>	<b>Ranchi</b>		<b>Kolkata</b>	
	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
0-1 yr	31	24%	11	8%
1-2 yrs	52	40%	54	38%
2-4 yrs	33	26%	59	41%
above 4 yrs	13	10%	20	14%
Grand Total	129	100%	144	100%

**Figure 4.8: Span of using the mobile payment systems**



The above graph depicts that in case of Ranchi city, 40% users were using mobile payment systems since about 1-2 years, 26% of users were using it from about 2-4 years, almost 24% of the users were using mobile payment systems since 0-1 years, and only 10% were using it since above 4 yrs.

For Kolkata, 41% of users were using it from about 2-4 years, 38% users were using mobile payment systems since about 1-2 years, only 14% were using it since above 4 yrs and only 8% of the users were using mobile payment systems since 0-1 years.

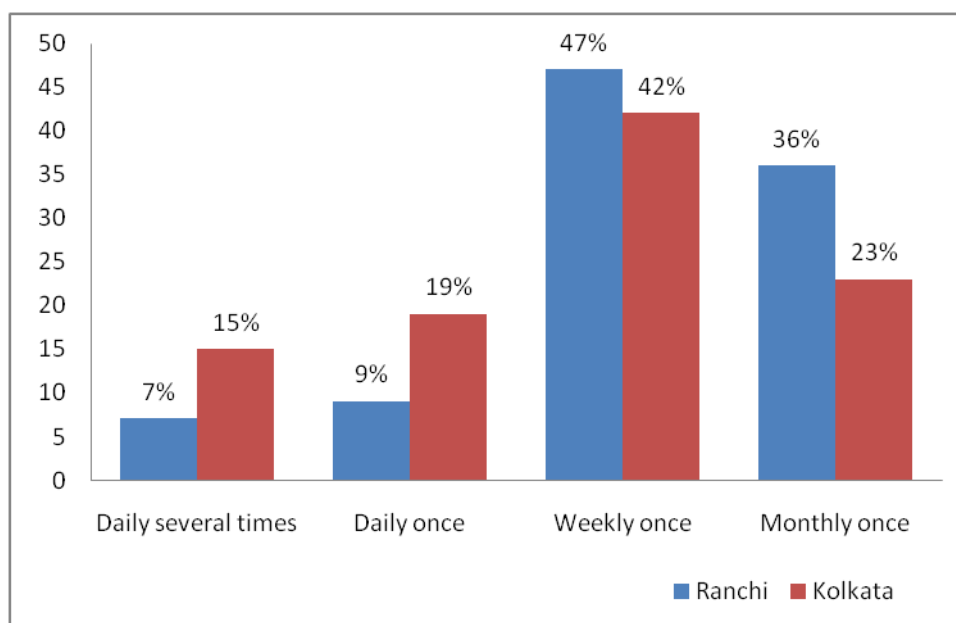
#### **4.2.4.3 Frequency of using the mobile payment system**

Also there was a question to know about the regularity of use of mobile payment systems, respondents were asked about their frequency of use of mobile payment systems and the result is shown below.

**Table 4.11: Frequency of using the mobile payment system**

Frequency of use	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Daily several times	9	7%	22	15%
Daily once	12	9%	28	19%
Weekly once	61	47%	61	42%
Monthly once	47	36%	33	23%
Grand Total	129	100%	144	100%

**Figure 4.9: Frequency of using mobile payment by consumers**



Above graph explains that for Ranchi, Maximum number of users i.e. 47% was found using mobile payment once in a week, 36% of users used it once in a month, 9% of the users used mobile payment once daily, and only 7% of users were using mobile payments several times daily.



While for Kolkata, , Maximum number of users i.e. 42% was found using mobile payment once in a week, 23% of users used it once in a month, 19% of the users used mobile payment once daily and 15% of users were using mobile payments several times daily.

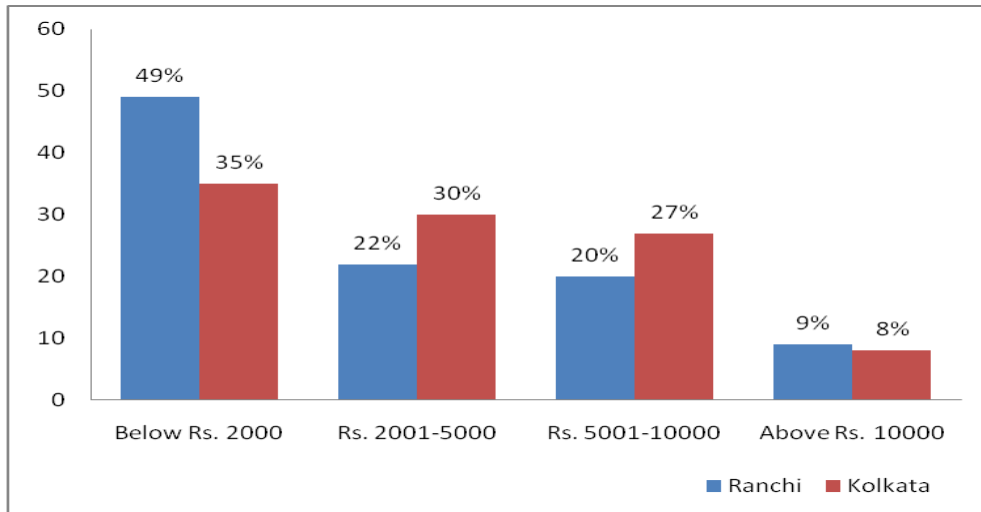
#### **4.2.4.4 Expenditure made through mobile payment systems by consumers**

To find out how much do consumers spent on mobile payment systems transactions in a month, respondents were requested to choose from the given options from below 2000 rupees to above 10000 rupees. Table below exhibits the response given by the consumers.

**Table 4.12: Expenditure made through mobile payment systems by consumers**

Monthly expense on mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Below Rs. 2000	63	49%	50	35%
Rs. 2001-5000	28	22%	43	30%
Rs. 5001-10000	26	20%	39	27%
Above Rs. 10000	12	9%	12	8%
Grand Total	129	100%	144	100%

**Figure 4.10: Expenditure made through mobile payment systems by consumer**



Above graph shows the monthly expenditure made by users through mobile payment systems. Regarding Ranchi, 49% of the total users spend below 2000 monthly, 22% of users spent between Rs. 2001-5000 monthly, 20% of users spent between Rs. 5001-10000 monthly and only 9% spent above Rs. 10,000 per month through mobile payment. With respect to Kolkata, 35% of the total users spend below 2000 monthly, 30% of users spent between Rs. 2001-5000 monthly, 27% of users spent between Rs. 5001-10000 monthly and only 8% user spent above Rs. 10,000 per month through mobile payment.

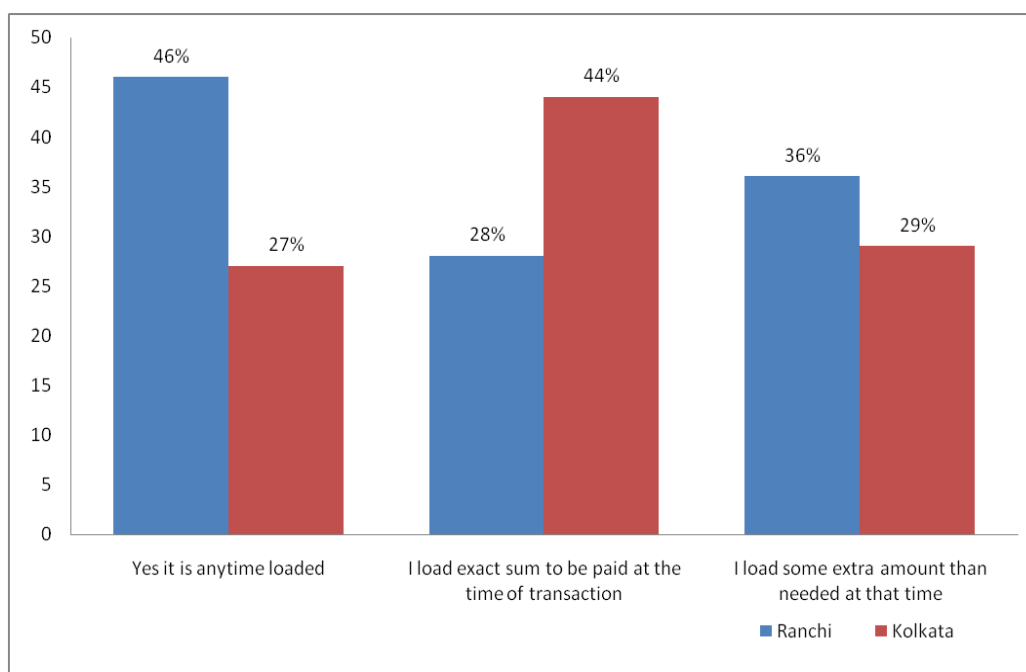
#### **4.2.4.5 Loading of balance in consumers mobile wallet**

In respect to know about if the consumers keep money in their mobile wallets they were requested to answer if their wallet is loaded or not. Table below shows the responses given by the consumers.

**Table 4.13: Money balance loaded in mobile payment wallet by consumer**

mobile wallets loaded with balance	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes it is anytime loaded	59	46%	39	27%
I load exact sum to be paid at the time of transaction	36	28%	63	44%
I load some extra amount than needed at that time	34	36%	42	29%
Grand Total	129	100%	144	100%

**Figure 4.11: Money balance in mobile payment wallet by consumer**



In Ranchi city, 46% of the users keep their wallet balance loaded anytime, 28% load exact amount required for transaction and 26% load some extra amount than required at time of transaction. In Kolkata city, 44% users load only exact amount required for transaction at that time and 29% load some extra amount than required at the time of transaction and 27% users keep their wallet loaded anytime,.

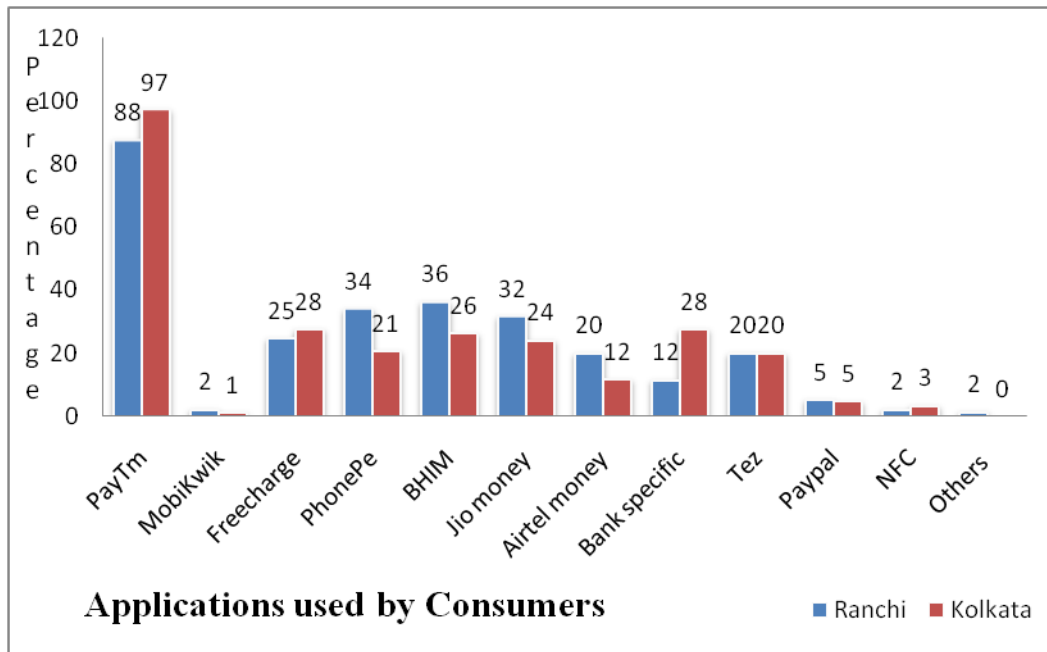
#### 4.2.4.6 Mobile payment applications installed by consumers

Table below exhibits the mobile payment apps installed by individuals in their mobile phones to know about what mobile payment apps are used by them.

**Table 4.14: Mobile payment application used by consumers**

Mobile payment apps installed	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
PayTm	113	88%	140	97%
MobiKwik	3	2%	2	1%
FreeCharge	32	25%	40	28%
PhonePe	44	34%	30	21%
BHIM	47	36%	38	26%
Jio Money	41	32%	35	24%
Airtel Money	26	20%	17	12%
Bank Specific	15	12%	40	28%
Tez	26	20%	29	20%
PayPal	7	5%	7	5%
NFC	3	2%	5	3%
Others	3	2%	0	0%

**Figure 4.12: Applications used for mobile payment by consumers**



Regarding the most installed Mobile Payment System among consumers, PayTm was found to be the most used mobile payment application in both cities with 88% in Ranchi and 97% in Kolkata. BHIM was used by 36% of the users in Ranchi and 26% of the users in Kolkata. PhonePe was used by 34% users in Ranchi and 21% users in Kolkata. Use of remaining applications were insignificant in percentage and showed almost similar pattern in both the cities

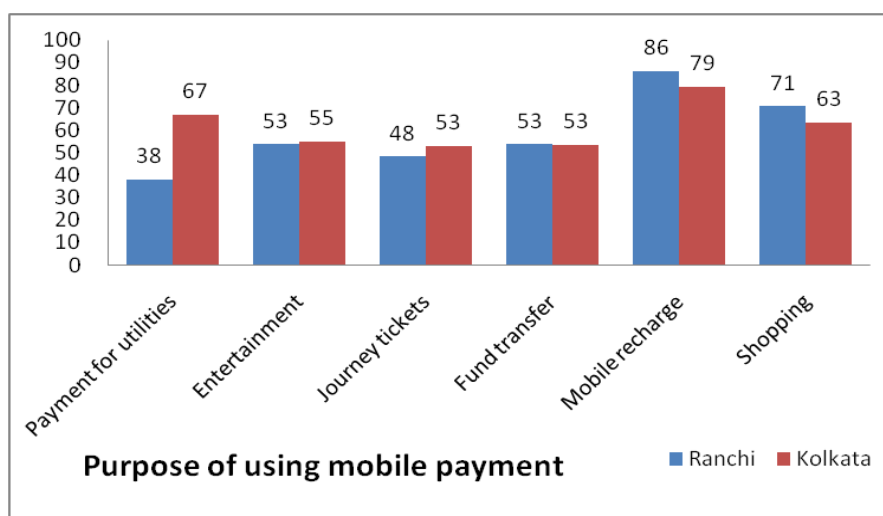
#### 4.2.4.7 Purposes for which mobile payment system is used

Given below the table shows the purposes for which mobile payment systems is used by the consumers.

**Table 4.15: Purpose for which mobile payment system is used by consumers**

Purpose of using mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Payment for utilities	49	38%	96	67%
Entertainment	69	53%	79	55%
Journey tickets	62	48%	76	53%
Fund transfer	69	53%	77	53%
Mobile recharge	111	86%	114	79%
Shopping	91	71%	91	63%

**Figure 4.13: Purpose which mobile payment system is used by consumers**



Based on the question about for what purposes was mobile payment used among the consumers it was revealed that mobile payments is used for all the six options given in the question. Mobile Payments were mostly used for mobile recharge in Ranchi, almost 86% uses it for mobile recharge followed by shopping used by 71%. Even in Kolkata people use Mobile Payments

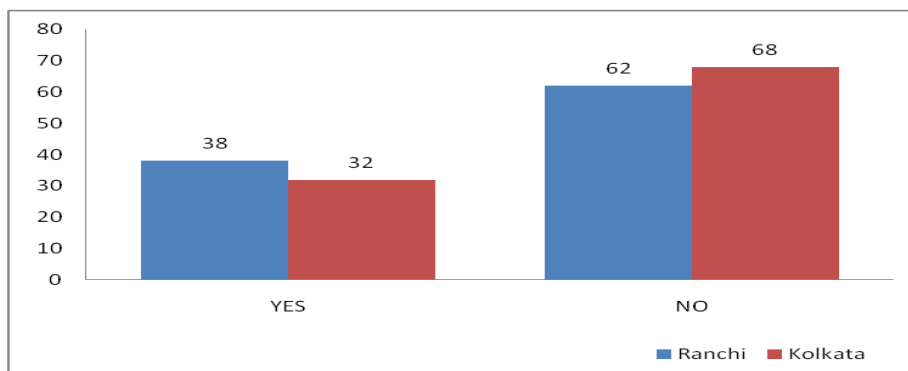
mostly for mobile recharge as 79 % of the respondents use it for mobile recharge followed by payment for utilities done through mobile by 67% of the respondents and used for shopping by 63% of the respondents.

#### 4.2.4.8 Feel it is risky to use mobile payment systems

**Table 4.16: Feeling of risk while using mobile payment by consumers**

Risk of financial data	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	49	38%	46	32%
No	80	62%	98	68%
Grand total	129	100%	144	100%

**Figure 4.14: Feeling of risk while using mobile payment by consumers**



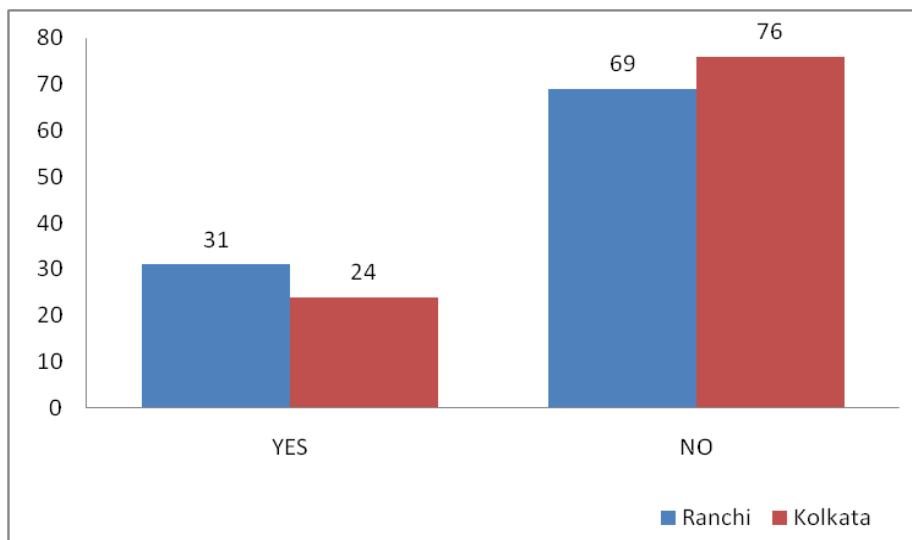
To know about the sense of risk among users about the use of mobile payment, users were asked to reply in Yes or No. It was observed that 62% of the Ranchi users feel no risk in using mobile payment, whereas 68% of the Kolkata users felt the same. 38% of the Ranchi users felt risk in using mobile payment, whereas 32% of users in Kolkata felt the same.

#### 4.2.4.9 Feeling that merchant may misuse the financial data while using mobile payment systems

**Table 4.17: Feeling of misuse of their credentials by merchants while using mobile payment system**

Feeling of misuse of data by merchants	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	40	31%	35	24%
No	89	69%	109	76%
Grand total	129	100%	144	100%

**Figure 4.15: Feeling of misuse of their credentials by merchants while using mobile payment system**



To know about the sense of misuse of credentials by merchants among users about the use of mobile payment, users were asked to reply in Yes or No. It was observed that 69% of the Ranchi users felt that merchants will not misuse their credential in using mobile payment, whereas 76% of the Kolkata users felt so. 31% of the Ranchi users felt that merchants may misuse their credentials in using mobile payment, only whereas 24% of users in Kolkata felt so.

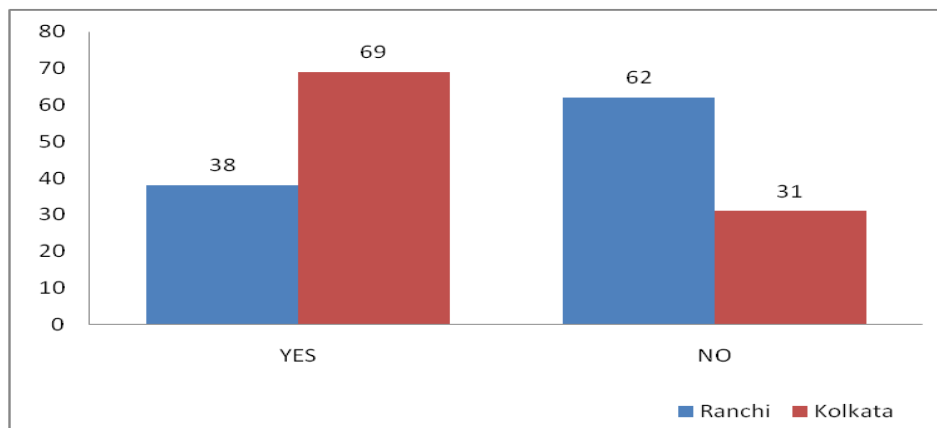


#### 4.2.4.10 Experience of merchant discouragement

**Table 4.18: Experience of merchant discouragement**

Merchant discouragement for mobile payment use	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	49	38%	44	69%
No	80	62%	100	31%
Grand total	129	100%	144	100%

**Figure 4.16: Experience of merchant discouragement**

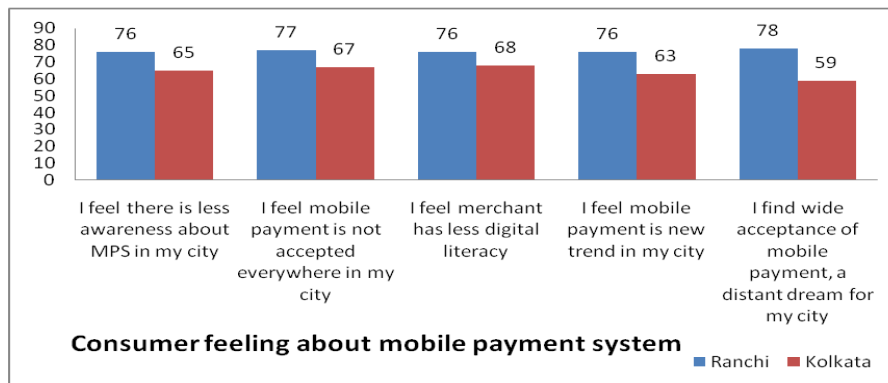


To know about level of discouragement faced by consumers from merchants while using mobile payment, users were asked to reply in yes or no. It was found out that 38% of users in Ranchi faced discouragement from merchant in paying through mobile payment, where as 69% users in Kolkata faced the same from merchants. 62% merchants did not discourage people in doing

mobile payment in Ranchi, whereas 31% users of Kolkata did not face this issue.

#### 4.2.4.11 Perception about mobile payment in their city

**Figure 4.17: Perception about mobile payment in their city**



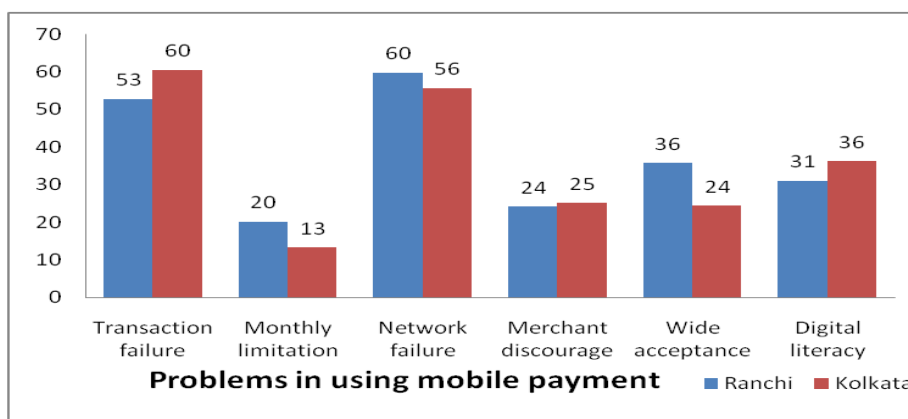
Majority of consumers in Ranchi, i.e. 76 % feel that there is less awareness about mobile payment systems in their city, while 65% of Kolkata consumers feel so. 77% of the respondents in Ranchi city agree with the fact that mobile payment not being accepted everywhere in the city, whereas 67% of the Kolkata respondents feel so. Digital illiteracy among merchants is felt by 76% of Ranchi respondents, whereas same is felt by 68% of Kolkata respondents. About mobile payment being recent trend in the city, 76% of Ranchi city respondents felt so, while 63% of Kolkata respondents felt so. Wide acceptance of mobile payment seems to be distant dream to 78% of the Ranchi respondents, while 59% of Kolkata respondents agree to this.

#### 4.2.4.12 Problems faced by while using mobile payment systems

**Table 4.19: Problems faced while use of mobile payment by consumers**

Problems while using mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Transaction failure	68	53%	87	60%
Monthly limitation	26	20%	18	13%
Network failure	77	60%	80	56%
Merchant discouragement	31	24%	36	25%
Wide acceptance	46	36%	35	24%
Digital literacy	40	31%	52	36%

**Figure 4.18: Problems faced in using mobile payment by consumers**



To know about the problems faced by the consumers, six options were given in which consumers could choose more than one option. 60% of the users in Ranchi faced the issue of network failure in using mobile payment systems, whereas 56% of the users in Kolkata faced the same issue. 53% of the users in Ranchi faced the issue of transaction failure in using mobile payment systems, whereas 60% of the users in Kolkata faced the same issue. Merchant

discouragement was faced by 24% users in Ranchi and 25% users in Kolkata. Wide acceptance and digital literacy were also similarly faced by the users of both cities. Monthly limitation was least bothering issue for users as it was faced by only 20% users in Ranchi and 13% users in Kolkata.

#### 4.2.5 Results of Factor Analysis

Factor analysis is done for only users comprising 273 respondents.

##### 4.2.5.1 KMO Bartlett's Test Results

Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy help to access the factorability of the data. P-value of Bartlett's test of sphericity should be less than 0.05 for factor analysis to be considered suitable. KMO index should lie between 0 to 1, and if higher than 0.6, it is considered good for a factor analysis (Pallant, 2005).

**Table 4.20: KMO Bartlett's test of consumers**

<b>KMO and Bartlett's Test</b>			
Kaiser-Meyer-Olkin Measure of Sampling Adequacy			.912
Bartlett's Test of Sphericity	Approx. Chi-Square	3641	.047
	df	253	
	Sig.	.000	

In the case of consumers, KMO value is 0.912 (which is above 0.6), we have p-value 0.000 (which is  $\leq 0.5$ ), therefore factor analysis is appropriate.

#### 4.2.5.2 Exploratory Factor Analysis

**Table 4.21: Total variance test of consumers**

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.318	40.512	40.512	9.318	40.512	40.512	4.048	17.598	17.598
2	2.302	10.010	50.522	2.302	10.010	50.522	2.980	12.954	30.552
3	1.504	6.538	57.060	1.504	6.538	57.060	2.880	12.522	43.075
4	1.199	5.213	62.273	1.199	5.213	62.273	2.832	12.313	55.388
5	1.035	4.501	66.774	1.035	4.501	66.774	2.619	11.386	66.774
6	.839	3.648	70.422						
7	.789	3.432	73.854						
8	.668	2.906	76.760						
9	.622	2.703	79.463						
10	.566	2.460	81.922						
11	.492	2.138	84.061						
12	.482	2.096	86.157						
13	.454	1.975	88.132						
14	.393	1.709	89.841						
15	.377	1.638	91.479						
16	.353	1.536	93.015						
17	.299	1.302	94.316						
18	.272	1.180	95.497						
19	.254	1.103	96.600						
20	.222	.967	97.567						

21	.220	.958	98.525						
22	.195	.850	99.375						
23	.144	.625	100.000						
			0						

Percentage of variance as shown in table 4.3 shows total variance attributed to each factor. Principal components analysis revealed the presence of five components with eigenvalues exceeding 1, explaining 17.60 per cent, 12.96 per cent, 12.51 per cent, 12.31 and 11.39 per cent of the variance respectively.

**Table 4.22: Rotated component matrix of consumers**

Rotated Component Matrix <sup>a</sup>					
	Component				
	1	2	3	4	5
I find it very useful (v1)	.829	.174	.084	.107	.236
It makes my payment quick (v2)	.857	.083	.096	.156	.191
I can use it from anywhere at anytime (v3)	.798	.117	.101	.172	.175
It helps me to keep track of my day to day expense (v4)	.441	.415	.390	.261	-.178
It eases my transaction while shopping online or booking tickets (v5)	.605	.124	.188	.349	.122
It is easy to use (v6)	.382	.002	.164	.776	.124
I may not carry wallet, but I carry my mobile everywhere (v7)	.292	.018	.231	.597	.063
It is compatible with my lifestyle (v8)	.349	.410	.096	.647	.075
It was easy for me to learn its process (v9)	.285	.270	.095	.724	.114
It was easy for me to become skilful in using it (v10)	.201	.202	.161	.718	.275
I think it will add to my image in my community (v11)	-.045	.618	.326	.390	.171
I encourage my family and friends to use mobile payment (v12)	.424	.679	.076	.200	.151
People important to me use it (v13)	.019	.847	.209	.128	.191
It has made life of my family and friends easier (v14)	.142	.740	.245	.130	.238
I support cashless India (v15)	.293	.185	.571	.237	.177

I use to help in curbing black money (v16)	.250	.149	.713	.260	.109
I have started using mobile payment after demonetisation (v17)	-.023	.195	.701	-.027	.274
I prefer to use mobile payment launched by the government (v18)	.070	.154	.763	.134	.196
I trust my app provider (v19)	.226	.348	.408	.112	.462
I use mobile payment because cashbacks are given (v20)	.220	.263	.099	-.106	.707
I want cross wallet transfer feature in mobile payment (v21)	.164	.121	.211	.153	.749
I am concerned about my refund in case of transaction failure (v22)	.209	.068	.153	.295	.675
I trust my app provider because of good reviews in mass/social media (v23)	.114	.154	.362	.336	.551

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Interpretation – From the above table, it is found that v1, v2, v3, v4 and v5 show more loadings under the first component and thus it can be named as Usefulness Factors. These are the variables that have utility on use of mobile payment system. Similarly v11, v12, v13 & v14 have more loadings under the second component and thus it can be named as Social Influence Factors. Likewise, v15, v16, v17 & v18 have more loadings under the third component and thus it can be named as Government Initiatives Factors. It was further found that v6, v7, v8, v9 & v10 have more loadings under the fourth component and thus it can be named as Ease of Use Factors and finally v19, v20, v21, v22 & v23 show more loadings under the fifth component and thus it can be named as Application Providers Factors. So total of five factors were extracted.

#### 4.2.5.3 Reliability analysis

Cronbach's alpha was used to check the reliability of all the factors taken in the questionnaire and to check the internal consistency within each factor. The factors with Cronbach's value equal to or greater than 0.7, are considered as reliable and shall be considered for further analysis. The Cronbach's alpha value of the items of each factor is mentioned below.

**Table 4.23: Cronbach's alpha value of consumer respondents**

<b>Factor</b>	<b>Description</b>	<b>Cronbach's Alpha value</b>
Usefulness	I use mobile payment because I find it very useful	0.844
	I use mobile payment because it makes my payment quick	
	I use mobile payment because I can use it from anywhere at anytime	
	I use mobile payment because it helps me to keep track of my day to day expense	
	I use mobile payment because it eases my transaction while shopping online or booking tickets	
Ease of use	I use mobile payment because easy to use	0.834
	I use mobile payment because I may not carry wallet, but I carry my mobile everywhere	
	I use mobile payment because it is compatible with my lifestyle	
	I use mobile payment because it was easy for me to learn its process	
	I use mobile payment because it was easy for me to become skilful in using it	



Social influence	I use mobile payment because I think it will add to my image in my community	0.844
	I encourage my family and friends to use mobile payment	
	I use mobile payment because my family and friends use it	
	I use mobile payment after seeing that it has made life of my family and friends easier	
Government	I use mobile payment to support cashless India	0.781
	I use mobile payment to help in curbing black money	
	I have started using mobile payment systems after demonetisation	
	I prefer to use mobile payment launched by the government	
Application provider	I use mobile payment because I trust my app provider	0.813
	I use mobile payment systems because cashbacks are given	
	I want cross wallet transfer feature in mobile payment systems	
	I am concerned about my refund in case of transaction failure	
	I trust my app provider because of good reviews in mass/social media	

#### 4.2.6 Hypotheses testing for finding association between demographic variables and awareness about the mobile payment systems

Chi-square test is done to explore the relationship between two categorical variables. In other words, we use chi square to find if categorical dependent variable and categorical independent variables are related.

##### 4.2.6.1 Association between City and Awareness about Mobile Payment Systems

**Table 4.24: Cross tabulation city's influence on awareness about mobile payment systems**

**City \* Awareness Crosstabulation**

			Awareness		Total
			Yes	No	
City	Ranchi	Count	181	19	200
		Expected Count	182.5	17.5	200.0
		% within City	90.5%	9.5%	100.0%
		% within Awareness	49.6%	54.3%	50.0%
		% of Total	45.3%	4.8%	50.0%
	Kolkata	Count	184	16	200
		Expected Count	182.5	17.5	200.0
		% within City	92.0%	8.0%	100.0%
		% within Awareness	50.4%	45.7%	50.0%

Total	Awareness			
	% of Total	46.0%	4.0%	50.0%
	Count	365	35	400
	Expected Count	365.0	35.0	400.0
	% within City	91.3%	8.8%	100.0%
	% within Awareness	100.0%	100.0%	100.0%
	% of Total	91.3%	8.8%	100.0%

90.5% of Ranchi respondents were aware of what mobile payment system is, while 9.5% did not know that payment can be made through their mobile phone. In case of Kolkata city, 92% of the respondents knew about mobile payment system, whereas 8% were unaware. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.

**Table 4.25: Chi-square test for city's influence on awareness**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	.282 <sup>a</sup>	1	.596		
Continuity Correction <sup>b</sup>	.125	1	.723		
Likelihood Ratio	.282	1	.595		

Fisher's Exact Test				.724	.362
Linear-by-Linear Association	.281	1	.596		
N of Valid Cases	400				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 17.50.

b. Computed only for a 2x2 table

H<sub>01a</sub>-There is no association between the awareness about the mobile payment system and city of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case, the significance value of .723 is larger than the alpha value of .05, so we can conclude that our result is not significant. This means that the proportion of Ranchi people that are aware about the mobile payment is not significantly different from the proportion of Kolkata people that are aware about the mobile payment system.

#### 4.2.6.2 Association between Gender and Awareness about Mobile Payment Systems

**Table 4.26: Cross tabulation for gender's influence on awareness**

**Gender \* Awareness Crosstabulation**

			Awareness		Total
			Yes	No	
Gender	Male	Count	245	20	265
		Expected Count	241.8	23.2	265.0

	% within Gender	92.5%	7.5%	100.0%
	% within Awareness	67.1%	57.1%	66.3%
	% of Total	61.3%	5.0%	66.3%
	Female Count	120	15	135
	Expected Count	123.2	11.8	135.0
	% within Gender	88.9%	11.1%	100.0%
	% within Awareness	32.9%	42.9%	33.8%
	% of Total	30.0%	3.8%	33.8%
	Total Count	365	35	400
	Expected Count	365.0	35.0	400.0
	% within Gender	91.3%	8.8%	100.0%
	% within Awareness	100.0%	100.0%	100.0%
	% of Total	91.3%	8.8%	100.0%

92.5% of the total males were aware about mobile payment system, while 7.5% were unaware. For females, 88.9% were aware, while, 11.1% were aware about mobile payment system. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.

**Table 4.27: Chi-square test for gender's influence on awareness**

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	1.423 <sup>a</sup>	1	.233	.263	.157
Continuity Correction <sup>b</sup>	1.011	1	.315		
Likelihood Ratio	1.377	1	.241		
Fisher's Exact Test					
Linear-by-Linear Association	1.419	1	.234		
N of Valid Cases	400				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.81.

b. Computed only for a 2x2 table

H<sub>0</sub>2a-There is no association between the awareness about the mobile payment system and gender of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .315 is larger than the alpha value of .05, so we can conclude that our result is not significant. This means that the proportion of male that are aware

about the mobile payment system is not significantly different from the proportion of female that are aware about the mobile payment system.

#### 4.2.6.3 Association between Age and Awareness about Mobile Payment Systems

**Table 4.28: Cross tabulation for age's influence on awareness**

##### Age \* Awareness Crosstabulation

		Awareness		Total
		Yes	No	
Age	Count	114	11	125
	Expected Count	114.1	10.9	125.0
	15 to 25 yrs			
	% within Age	91.2%	8.8%	100.0%
	% within Awareness	31.2%	31.4%	31.3%
	% of Total	28.5%	2.8%	31.3%
	Count	189	11	200
	Expected Count	182.5	17.5	200.0
	26 to 40 yrs			
	% within Age	94.5%	5.5%	100.0%
	% within Awareness	51.8%	31.4%	50.0%
	% of Total	47.3%	2.8%	50.0%
41 to 60 yrs	Count	49	6	55
	Expected Count	50.2	4.8	55.0
	% within Age	89.1%	10.9%	100.0%

	% within Awareness	13.4%	17.1%	13.8%
	% of Total	12.3%	1.5%	13.8%
	Count	13	7	20
	Expected Count	18.3	1.8	20.0
Above 61 yrs	% within Age	65.0%	35.0%	100.0%
	% within Awareness	3.6%	20.0%	5.0%
	% of Total	3.3%	1.8%	5.0%
	Count	365	35	400
Total	Expected Count	365.0	35.0	400.0
	% within Age	91.3%	8.8%	100.0%
	% within Awareness	100.0%	100.0%	100.0%
	% of Total	91.3%	8.8%	100.0%

In case of age group of 15 to 25 yrs about 91.2% were aware about mobile payment system and 8.8% were unaware. In case of age group of 26 to 40 yrs about 94.5% were aware about mobile payment system and 5.5% were unaware. In case of age group of 41 to 60 yrs about 94.5% were aware about mobile payment system and 5.5% were unaware. In case of age group of above 61 yrs about 65% were aware about mobile payment system and 35% were unaware. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.



**Table 4.29: Chi-square test for age's influence on awareness**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	20.228 <sup>a</sup>	3	.000
Likelihood Ratio	13.903	3	.003
Linear-by-Linear Association	6.550	1	.010
N of Valid Cases	400		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.75.

H<sub>0</sub>3a-There is no association between the awareness about the mobile payment system and age of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is smaller than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and age of the consumer.

#### 4.2.6.4 Association between Educational Qualification and Awareness about Mobile Payment Systems

**Table 4.30: Cross tabulation for qualification's influence on awareness**

##### **Educational qualification \* Awareness Crosstabulation**

			Awareness		Total
			Yes	No	
Educational qualification	Below intermediate	Count	16	4	20
		Expected Count	18.3	1.8	20.0
		% within Educational qualification	80.0%	20.0%	100.0%
		% within Awareness	4.4%	11.4%	5.0%
		% of Total	4.0%	1.0%	5.0%
	Intermediate	Count	50	4	54
		Expected Count	49.3	4.7	54.0
		% within Educational qualification	92.6%	7.4%	100.0%
		% within Awareness	13.7%	11.4%	13.5%
		% of Total	4.0%	1.0%	5.0%

	Graduate	Awareness			
		% of Total	12.5%	1.0%	13.5%
		Count	225	17	242
		Expected Count	220.8	21.2	242.0
		% within Educational qualification	93.0%	7.0%	100.0%
		% within Awareness	61.6%	48.6%	60.5%
		% of Total	56.3%	4.3%	60.5%
	PG and above	Count	74	10	84
		Expected Count	76.7	7.4	84.0
		% within Educational qualification	88.1%	11.9%	100.0%
		% within Awareness	20.3%	28.6%	21.0%
		% of Total	18.5%	2.5%	21.0%
		Count	365	35	400
	Total				

Expected Count	365.0	35.0	400.0
% within Educationa l qualificatio n	91.3%	8.8%	100.0%
% within Awareness	100.0%	100.0 %	100.0%
% of Total	91.3%	8.8%	100.0%

80% of below intermediate were aware about mobile payment system and 20% were unaware. In case of intermediate, 92.6% were aware about mobile payment system and 7.4% were unaware. In case of graduate, 93% were aware about mobile payment system and 7% were unaware. Of people possessing degree of PG and above, 88.1% were aware about mobile payment system, 11.9% were unaware. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.

**Table 4.31: Chi-square test for qualification's influence on awareness**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.241 <sup>a</sup>	3	.155
Likelihood Ratio	4.443	3	.217

Linear-by-Linear Association	.073	1	.788
N of Valid Cases	400		

2 cells (25.0%) have expected count less than 5. The minimum expected count is 1.75

H<sub>0</sub>4a-There is no association between the awareness about the mobile payment system and educational qualification of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .155 is larger than the alpha value of .05, so we can conclude that our result is not significant. This means that there is no association between the awareness about the mobile payment system and educational qualification of the consumer.

#### 4.2.6.5 Association between Occupation and Awareness about Mobile Payment Systems

**Table 4.32: Cross tabulation for occupation's influence on awareness**

##### **Occupation \* Awareness Crosstabulation**

			Awareness		Total
			Yes	No	
Occupation	Student	Count	68	6	74
		Expected Count	67.5	6.5	74.0
		% within Occupation	91.9%	8.1%	100.0%

Businessman	n			
	% within Awareness	18.6%	17.1%	18.5%
	% of Total	17.0%	1.5%	18.5%
	Count	75	6	81
	Expected Count	73.9	7.1	81.0
	% within Occupation	92.6%	7.4%	100.0%
	% within Awareness	20.5%	17.1%	20.3%
	% of Total	18.8%	1.5%	20.3%
	Count	41	4	45
	Expected Count	41.1	3.9	45.0
Occupational	% within Occupation	91.1%	8.9%	100.0%
	% within Awareness	11.2%	11.4%	11.3%
	% of Total	10.3%	1.0%	11.3%
	Count	38	2	40
Govt employee	Expected Count	36.5	3.5	40.0

		% within Occupation	95.0%	5.0%	100.0%
		% within Awareness	10.4%	5.7%	10.0%
		% of Total	9.5%	0.5%	10.0%
	Pvt employee	Count	106	6	112
		Expected Count	102.2	9.8	112.0
	Housewife	% within Occupation	94.6%	5.4%	100.0%
		% within Awareness	29.0%	17.1%	28.0%
		% of Total	26.5%	1.5%	28.0%
		Count	25	5	30
		Expected Count	27.4	2.6	30.0
	Unemployed	% within Occupation	83.3%	16.7%	100.0%
		% within Awareness	6.8%	14.3%	7.5%
		% of Total	6.3%	1.3%	7.5%
		Count	12	6	18

Total	Expected Count	16.4	1.6	18.0
	% within Occupation	66.7%	33.3%	100.0%
	% within Awareness	3.3%	17.1%	4.5%
	% of Total	3.0%	1.5%	4.5%
	Count	365	35	400
	Expected Count	365.0	35.0	400.0
	% within Occupation	91.3%	8.8%	100.0%
	% within Awareness	100.0%	100.0%	100.0%
	% of Total	91.3%	8.8%	100.0%

99.1% of students were aware about mobile payment system, 8.1% were unaware. 92.6% of businessman were aware about mobile payment system, 7.4% were unaware. 91.1% of professionals were aware about mobile payment system, 8.9% were unaware. 94.6% of government employees were aware about mobile payment system, 4.4% were unaware. 83.3% of housewives were aware about mobile payment system, 16.7% were unaware. 83.3% of private employees were unaware about mobile payment system, while 16.7% were unaware. 66.7% of unemployed were aware about mobile



payment system, 33.3% were unaware. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.

**Table 4.33: Chi-square test for occupation's influence on awareness**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	18.521 <sup>a</sup>	6	.005
Likelihood Ratio	13.329	6	.038
Linear-by-Linear Association	2.973	1	.085
N of Valid Cases	400		

a. 4 cells (28.6%) have expected count less than 5. The minimum expected count is 1.58.

H<sub>0</sub>5a-There is no association between the awareness about the mobile payment system and occupation of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .005 is smaller than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and occupation of the consumer.

#### 4.2.6.6 Association between Income and Awareness about Mobile Payment Systems

**Table 4.34: Cross tabulation for income's influence on awareness**

##### Monthly Income \* Awareness Crosstabulation

				Awareness		Total
				Yes	No	
Monthly Income	Upto Rs. 10k	Count		121	20	141
		Expected Count		128.7	12.3	141.0
		% within Monthly Income		85.8%	14.2%	100.0%
		% within Awareness		33.2%	57.1%	35.3%
		% of Total		30.3%	5.0%	35.3%
	Rs. 10k-30k	Count		97	7	104
		Expected Count		94.9	9.1	104.0
		% within Monthly Income		93.3%	6.7%	100.0%
		% within Awareness		26.6%	20.0%	26.0%
		% of Total		24.3%	1.8%	26.0%
	Rs. 30k-50k	Count		67	2	69
		Expected Count		63.0	6.0	69.0
		% within Monthly Income		97.1%	2.9%	100.0%

Total	Rs. 50k-1lakh	% within Awareness	18.4%	5.7%	17.3%
		% of Total	16.8%	0.5%	17.3%
		Count	55	5	60
		Expected Count	54.8	5.3	60.0
	Above Rs. 1lakh	% within Monthly Income	91.7%	8.3%	100.0%
		% within Awareness	15.1%	14.3%	15.0%
		% of Total	13.8%	1.3%	15.0%
		Count	25	1	26
		Expected Count	23.7	2.3	26.0
		% within Monthly Income	96.2%	3.8%	100.0%
		% within Awareness	6.8%	2.9%	6.5%
		% of Total	6.3%	0.3%	6.5%
		Count	365	35	400
		Expected Count	365.0	35.0	400.0
		% within Monthly Income	91.3%	8.8%	100.0%
		% within Awareness	100.0%	100.0%	100.0%
		% of Total	91.3%	8.8%	100.0%

85.8% of respondents having monthly income of upto Rs. 10,000 were aware about mobile payment system, whereas 14.2% were unaware. In case of income group of Rs 10,001-30,000, 93.3% were aware about mobile payment system, 6.7% were unaware. For income group of Rs. 30,001-50,000, 97.1% were aware about mobile payment system and 2.9% were unaware. For income group of Rs. 50,001-1lakh, 91.7% were aware about mobile payment system, while 8.3% were unaware. For respondents earning above Rs. 1lakh, 96.2% were aware and 3.8% were unaware. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.

**Table 4.35: Chi-square test for income's influence on awareness**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	9.501 <sup>a</sup>	4	.050
Likelihood Ratio	9.933	4	.042
Linear-by-Linear Association	4.979	1	.026
N of Valid Cases	400		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 2.28.

H<sub>0</sub>6a-There is no association between the awareness about the mobile payment system and income of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .05 is equal to the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and income of the consumer.

#### 4.2.6.7 Association between Personal innovativeness and Awareness about Mobile Payment Systems

**Table 4.36: Cross tabulation personal innovation's influence on awareness**

##### Personal innovativeness \* Awareness Crosstabulation

				Awareness		Total
				Yes	No	
When a new technology is introduced in the market	I am usually among the first to use	Count	Expected Count	106	1	107
		% within Personal innovativeness		97.6	9.4	107.0
		% within Awareness		99.1%	0.9%	100.0%
		% of Total		29.0%	2.9%	26.8%
	I wait for others to	Count	Expected Count	149	14	163
				148.7	14.3	163.0

	use first	Count			
		% within			
		Personal innovativeness	91.4%	8.6%	100.0%
		% within Awareness	40.8%	40.0%	40.8%
		% of Total	37.3%	3.5%	40.8%
		Count	82	8	90
	I am among late users	Expected Count	82.1	7.9	90.0
		% within Personal innovativeness	91.1%	8.9%	100.0%
		% within Awareness	22.5%	22.9%	22.5%
		% of Total	20.5%	2.0%	22.5%
		Count	28	12	40
		Expected Count	36.5	3.5	40.0
	I prefer using old technology only	% within Personal innovativeness	70.0%	30.0%	100.0%
		% within	7.7%	34.3%	10.0%

Total	Awareness			
	% of Total	7.0%	3.0%	10.0%
	Count	365	35	400
	Expected Count	365.0	35.0	400.0
	% within Personal innovativeness	91.3%	8.8%	100.0%
	% within Awareness	100.0%	100.0%	100.0%
	% of Total	91.3%	8.8%	100.0%

99.1% of people among the first to use technology were aware about mobile payment system, while only 0.9% were unaware. In case of the one who waits for others to use first, 91.4% were aware about mobile payment system, while 8.6% were unaware. For the late users, 91.1% were aware, 8.9% were unaware. Among the ones preferring old technology, 70% were aware about mobile payment system, 30% were unaware. According to the result, 91.3% of the sample was aware about mobile payment system, whereas 8.7% were unaware.

**Table 4.37: Chi-square test for personal innovation's influence on awareness**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2- sided)</b>
Pearson Chi-Square	30.815 <sup>a</sup>	3	.000
Likelihood Ratio	27.681	3	.000
Linear-by-Linear Association	23.383	1	.000
N of Valid Cases	400		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 3.50.

H<sub>0</sub>7a-There is no association between the awareness about the mobile payment system and personal innovativeness of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is smaller than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and personal innovativeness of the consumer.



#### 4.2.7 Hypotheses testing for finding association between demographic variables and use of the mobile payment systems

##### 4.2.7.1 Association between City and Use of Mobile Payment Systems

**Table 4.38: Cross tabulation for use and city**

**City \* Do you use mobile payment system Crosstabulation**

			Do you use mobile payment system		Total
			Yes	No	
City	Ranchi	Count	129	71	200
		Expected Count	136.5	63.5	200.0
		% within City	64.5%	35.5%	100.0%
		% within Do you use mobile payment system	47.3%	55.9%	50.0%
		% of Total	32.3%	17.8%	50.0%
	Kolkata	Count	144	56	200
		Expected Count	136.5	63.5	200.0
		% within City	72.0%	28.0%	100.0%
		% within Do you use mobile payment system	52.7%	44.1%	50.0%
		% of Total	36.0%	14.0%	50.0%
Total	Count	273	127	400	

Expected Count	273.0	127.0	400.0
% within City	68.3%	31.8%	100.0%
% within Do you use mobile payment system	100.0%	100.0%	100.0%
% of Total	68.3%	31.8%	100.0%

64.5% of Ranchi respondents were using mobile payment system is, while 35.5% did not use mobile payment. In case of Kolkata city, 72% of the respondents were using mobile payment system, whereas 8% were non users. According to the result, 68.3% of the sample was using mobile payment system, whereas 31.7% were not using.

**Table 4.39: Chi-square test for use and city**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.596 <sup>a</sup>	1	.107		
Continuity Correction <sup>b</sup>	2.261	1	.133		
Likelihood Ratio	2.600	1	.107		
Fisher's Exact Test				.132	.066
Linear-by-Linear	2.589	1	.108		

Association					
N of Valid Cases	400				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 63.50.

b. Computed only for a 2x2 table

H<sub>0</sub>1b-There is no association between the use of mobile payment system and city of the consumer

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .133 is *larger* than the alpha value of .05, so we can conclude that our result is *not* significant. This means that the proportion of Ranchi people that uses the mobile payment system is not significantly different from the proportion of Kolkata people that uses the mobile payment system.

#### 4.2.7.2 Association between Gender and Use of Mobile Payment Systems

**Table 4.40: Cross tabulation for use and gender**

**Gender \* Do you use mobile payment system Crosstabulation**

			Do you use mobile payment system		Total
			Yes	No	
Gender	Male	Count	187	78	265
		Expected Count	180.9	84.1	265.0
		% within Gender	70.6%	29.4%	100.0%
		% within Do you use mobile payment system	68.5%	61.4%	66.3%

Total	Female	% of Total	46.8%	19.5%	66.3%
		Count	86	49	135
		Expected Count	92.1	42.9	135.0
		% within Gender	63.7%	36.3%	100.0%
		% within Do you use mobile payment system	31.5%	38.6%	33.8%
	Male	% of Total	21.5%	12.3%	33.8%
		Count	273	127	400
		Expected Count	273.0	127.0	400.0
		% within Gender	68.3%	31.8%	100.0%
		% within Do you use mobile payment system	100.0%	100.0%	100.0%
		% of Total	68.3%	31.8%	100.0%

70.6% of the total males were using mobile payment system, while 29.4% were not using it. For females, 63.7% were using, while, 36.3% were non users of mobile payment system. According to the result, 68.3% of the sample was using mobile payment system, whereas 31.7% were not using.

**Table 4.41: Chi-square test for use and gender**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	1.944 <sup>a</sup>	1	.163	.174	.101
Continuity Correction <sup>b</sup>	1.640	1	.200		
Likelihood Ratio	1.923	1	.166		
Fisher's Exact Test					
Linear-by-Linear Association	1.939	1	.164		
N of Valid Cases	400				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 42.86.

b. Computed only for a 2x2 table

H<sub>0</sub>2b-There is no association between the use of mobile payment system and gender of the consumer

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .200 is *larger* than the alpha value of .05, so we can conclude that our result is *not* significant. This means that the proportion of male that uses the mobile payment system is not significantly different from the proportion of female that uses the mobile payment system.

### 4.2.7.3 Association between Age and Use of Mobile Payment Systems

**Table 4.42: Cross tabulation for use and age**

**Age \* Do you use mobile payment system Crosstabulation**

			Do you use mobile payment system		Total
			Yes	No	
Age	15 to 25 yrs	Count	90	35	125
		Expected Count	85.3	39.7	125.0
		% within Age	72.0%	28.0%	100.0%
		% within Do you use mobile payment system	33.0%	27.6%	31.3%
		% of Total	22.5%	8.8%	31.3%
	26 to 40 yrs	Count	143	57	200
		Expected Count	136.5	63.5	200.0
		% within Age	71.5%	28.5%	100.0%
		% within Do you use mobile payment system	52.4%	44.9%	50.0%
		% of Total	35.8%	14.3%	50.0%
	41 to 60 yrs	Count	36	19	55
		Expected Count	37.5	17.5	55.0
		% within Age	65.5%	34.5%	100.0%

Above 61 yrs	% within Do you use mobile payment system	13.2%	15.0%	13.8%
	% of Total	9.0%	4.8%	13.8%
	Count	4	16	20
	Expected Count	13.7	6.4	20.0
	% within Age	20.0%	80.0%	100.0%
	% within Do you use mobile payment system	1.5%	12.6%	5.0%
	% of Total	1.0%	4.0%	5.0%
	Count	273	127	400
	Expected Count	273.0	127.0	400.0
	% within Age	68.3%	31.8%	100.0%
Total	% within Do you use mobile payment system	100.0%	100.0%	100.0%
	% of Total	68.3%	31.8%	100.0%

In case of age group of 15 to 25 yrs about 72% were using mobile payment system and 28% were non users. In case of age group of 26 to 40 yrs about 71.5% were users of mobile payment system and 28.5% were non users. In case of age group of 41 to 60 yrs about 65.5% were using mobile payment system and 34.5% were not using it. In case of age group of above 61 yrs only 20% were using mobile payment system and 80% were non users. According

to the result, 68.3% of the sample was using mobile payment system, whereas 31.7% were non users.

**Table 4.43: Chi-square test for use and age**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	23.472 <sup>a</sup>	3	.000
Likelihood Ratio	21.772	3	.000
Linear-by-Linear Association	11.636	1	.001
N of Valid Cases	400		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.35.

H<sub>0</sub>3b-There is no association between the use of mobile payment system and age of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the use of the mobile payment system and age of the consumer.



#### 4.2.7.4 Association between Educational Qualification and Use of Mobile Payment Systems

**Table 4.44: Cross tabulation for use and educational qualification**

**Educational qualification \* Do you use mobile payment system**

**Crosstabulation**

			Do you use mobile payment system		Total
			Yes	No	
Educational qualification	Below intermediate	Count	13	7	20
		Expected Count	13.7	6.4	20.0
		% within Educational qualification	65.0%	35.0%	100.0%
		% within Do you use mobile payment system	4.8%	5.5%	5.0%
	Intermediate	% of Total	3.3%	1.8%	5.0%
		Count	31	23	54
		Expected Count	36.9	17.1	54.0
		% within	57.4%	42.6%	100.0%

			Educational qualification			
			% within			
			Do you use			
			mobile	11.4%	18.1%	13.5%
			payment			
			system			
			% of Total	7.8%	5.8%	13.5%
			Count	167	75	242
			Expected			
			Count	165.2	76.8	242.0
Graduate			% within			
			Educational			
			qualification	69.0%	31.0%	100.0%
			% within			
			Do you use			
			mobile	61.2%	59.1%	60.5%
			payment			
			system			
			% of Total	41.8%	18.8%	60.5%
			Count	62	22	84
PG and above			Expected			
			Count	57.3	26.7	84.0
			% within			
			Educational			
			qualification	73.8%	26.2%	100.0%

Total	% within			
	Do you use			
	mobile	22.7%	17.3%	21.0%
	payment			
	system			
	% of Total	15.5%	5.5%	21.0%
	Count	273	127	400
	Expected			
	Count	273.0	127.0	400.0
	% within			
	Educational	68.3%	31.8%	100.0%
	qualification			
	% within			
	Do you use			
	mobile	100.0%	100.0%	100.0%
	payment			
	system			
	% of Total	68.3%	31.8%	100.0%

65% of below intermediate were using mobile payment system and 35% were not using it. In case of intermediate, 57.4% were users of mobile payment system and 42.6% were non users. In case of graduate, 69% were using mobile payment system and 31% were not using. Of people possessing degree of PG and above, 73.8% were users of mobile payment system, 26.2% were non users. According to the result, 68.3% of the sample was users of mobile payment system, whereas 31.7% were non users.

**Table 4.45: Chi-square test for use and education**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2- sided)</b>
Pearson Chi-Square	4.289 <sup>a</sup>	3	.232
Likelihood Ratio	4.189	3	.242
Linear-by-Linear Association	2.956	1	.086
N of Valid Cases	400		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.35.

H<sub>0</sub>4b-There is no association between the use of mobile payment system and educational qualification of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .232 is *larger* than the alpha value of .05, so we can conclude that our result is *not* significant. This means that there is no association between the use of the mobile payment system and age of the consumer.

#### 4.2.7.5 Association between Occupation and Use of Mobile Payment Systems

**Table 4.46: Cross tabulation for use and occupation**

**Occupation \* Do you use mobile payment system Crosstabulation**

			Do you use mobile payment system		Total
			Yes	No	
Occupation	Student	Count	53	21	74
		Expected Count	50.5	23.5	74.0
		% within Occupation	71.6%	28.4%	100.0%
		% within Do you use mobile payment system	19.4%	16.5%	18.5%
		% of Total	13.3%	5.3%	18.5%
	Businessman	Count	63	18	81
		Expected Count	55.3	25.7	81.0
		% within Occupation	77.8%	22.2%	100.0%
		% within Do you use	23.1%	14.2%	20.3%

	mobile payment system			
	% of Total	15.8%	4.5%	20.3%
Occupational	Count	31	14	45
	Expected Count	30.7	14.3	45.0
	% within Occupation	68.9%	31.1%	100.0%
	% within Do you use mobile payment system	11.4%	11.0%	11.3%
	% of Total	7.8%	3.5%	11.3%
Govt employee	Count	28	12	40
	Expected Count	27.3	12.7	40.0
	% within Occupation	70.0%	30.0%	100.0%
	% within Do you use mobile payment system	10.3%	9.4%	10.0%
	% of Total	7.0%	3.0%	10.0%

	Pvt employee	Count	82	30	112
		Expected Count	76.4	35.6	112.0
		% within Occupation	73.2%	26.8%	100.0%
		% within Do you use mobile payment system	30.0%	23.6%	28.0%
		% of Total	20.5%	7.5%	28.0%
	Housewife	Count	12	18	30
		Expected Count	20.5	9.5	30.0
		% within Occupation	40.0%	60.0%	100.0%
		% within Do you use mobile payment system	4.4%	14.2%	7.5%
		% of Total	3.0%	4.5%	7.5%
	Unemployed	Count	4	14	18
		Expected Count	12.3	5.7	18.0
		% within	22.2%	77.8%	100.0%

Total	Occupation			
	% within			
	Do you use			
	mobile	1.5%	11.0%	4.5%
	payment			
	system			
	% of Total	1.0%	3.5%	4.5%
	Count	273	127	400
	Expected			
	Count	273.0	127.0	400.0
	% within			
	Occupation	68.3%	31.8%	100.0%
	% within			
	Do you use			
	mobile	100.0%	100.0%	100.0%
	payment			
	system			
	% of Total	68.3%	31.8%	100.0%

71.6% of students were users of mobile payment system, 28.4% were non users. 77.8% of businessman were using mobile payment system, 22.2% were not using mobile payment. 68.9% of professionals were users mobile payment system, 31.1% were non users. 70% of government employees were using mobile payment system, 30% were non users. 73.2% of private employees were users of mobile payment system, while 26.8% were non users. 40% of housewives were using mobile payment system, 60% were non users. In the case of unemployed, only 22.2% were using mobile payment system, while



77.8% were non users. According to the result, 68.3% of the sample was users of mobile payment system, whereas 31.8% were non users.

**Table 4.47: Chi-square test for use and occupation**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	33.767 <sup>a</sup>	6	.000
Likelihood Ratio	31.595	6	.000
Linear-by-Linear Association	12.271	1	.000
N of Valid Cases	400		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.72.

H<sub>0</sub>5b-There is no association between the use of mobile payment system and occupation of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the use of the mobile payment system and occupation of the consumer.

#### 4.2.7.6 Association between Income and Use of Mobile Payment Systems

**Table 4.48: Cross tabulation for use and monthly income**

**Monthly Income \* Do you use mobile payment system Crosstabulation**

				Do you use mobile payment system		Total
				Yes	No	
Monthly Income	Upto Rs. 10k	Count		76	65	141
		Expected Count		96.2	44.8	141.0
		% within Monthly Income		53.9%	46.1%	100.0%
		% within Do you use mobile payment system		27.8%	51.2%	35.3%
		% of Total		19.0%	16.3%	35.3%
	Rs. 10k-30k	Count		80	24	104
		Expected Count		71.0	33.0	104.0
		% within Monthly Income		76.9%	23.1%	100.0%
		% within Do you use mobile payment system		29.3%	18.9%	26.0%
		% of Total		20.0%	6.0%	26.0%

	Rs. 30k-50k	Count	54	15	69
		Expected Count	47.1	21.9	69.0
		% within Monthly Income	78.3%	21.7%	100.0%
		% within Do you use mobile payment system	19.8%	11.8%	17.3%
		% of Total	13.5%	3.8%	17.3%
	Rs. 50k-1lakh	Count	42	18	60
		Expected Count	41.0	19.1	60.0
		% within Monthly Income	70.0%	30.0%	100.0%
		% within Do you use mobile payment system	15.4%	14.2%	15.0%
		% of Total	10.5%	4.5%	15.0%
	Above Rs. 1lakh	Count	21	5	26
		Expected Count	17.7	8.3	26.0
		% within Monthly Income	80.8%	19.2%	100.0%
		% within Do you use mobile	7.7%	3.9%	6.5%

Total	payment system			
	% of Total	5.3%	1.3%	6.5%
	Count	273	127	400
	Expected Count	273.0	127.0	400.0
	% within Monthly Income	68.3%	31.8%	100.0%
	% within Do you use mobile payment system	100.0%	100.0%	100.0%
	% of Total	68.3%	31.8%	100.0%

53.9% of respondents having monthly income of upto Rs. 10,000 were using mobile payment system, whereas 46.1% were non users. In case of income group of Rs 10,001-30,000, 76.9% were using mobile payment system, 23.1% were non users. For income group of Rs. 30,001-50,000, 78.3% were using mobile payment system and 21.7% were non users. For income group of Rs. 50,001-1lakh, 70% were using mobile payment system, while 30% were non users. For respondents earning above Rs. 1lakh, 80.8% were users and 19.2% were non users. According to the result, 68.3% of the sample was aware about mobile payment system, whereas 31.8% were non users.

**Table 4.49: Chi-square test for use and monthly income**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2-sided)</b>
Pearson Chi-Square	22.164 <sup>a</sup>	4	.000
Likelihood Ratio	21.990	4	.000
Linear-by-Linear Association	10.870	1	.001
N of Valid Cases	400		

0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.26.

H<sub>0</sub>6b-There is no association between the use of mobile payment system and income of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the use of the mobile payment system and income of the consumer.

#### 4.2.7.7 Association between Personal innovativeness and Use of Mobile Payment Systems

**Table 4.50: Cross tabulation for use and personal innovativeness**

**Personal innovativeness \* Do you use mobile payment system**  
**Crosstabulation**

	Do you use mobile payment system		Total
	Yes	No	
When a new technology is introduced in the market	94	13	107
I am usually among the first to use	73.0	34.0	107.0
Count Expected Count			
% within Personal innovativeness	87.9%	12.1%	100.0%
% within Do you use mobile payment system	34.4%	10.2%	26.8%
% of Total	23.5%	3.3%	26.8%

	I wait for others to use first	Count	118	45	163
		Expected Count	111.2	51.8	163.0
		% within Personal innovatines s	72.4%	27.6%	100.0 %
		% within Do you use mobile payment system	43.2%	35.4%	40.8%
		% of Total	29.5%	11.3%	40.8%
	I am among late users	Count	57	33	90
		Expected Count	61.4	28.6	90.0
		% within Personal innovatines s	63.3%	36.7%	100.0 %

		% within			
		Do you use			
		mobile	20.9%	26.0%	22.5%
		payment			
		system			
		% of Total	14.3%	8.3%	22.5%
	I prefer using old technolog y only	Count	4	36	40
		Expected	27.3	12.7	40.0
		Count			
		% within			
Total		Personal			
		innovatines	10.0%	90.0%	100.0
		s			%
		% within			
		Do you use			
		mobile	1.5%	28.3%	10.0%
		payment			
		system			
		% of Total	1.0%	9.0%	10.0%
		Count	273	127	400
		Expected			
		Count	273.0	127.0	400.0



% within Personal innovativeness	68.3%	31.8%	100.0%
% within Do you use mobile payment system	100.0%	100.0%	100.0%
% of Total	68.3%	31.8%	100.0%

87.9% of people among the first to use technology were using mobile payment system, while only 12.1% were not using it. In case of the one who waits for others to use first, 72.4% were using the mobile payment system, while 27.6% were not using it. For the late users, 63.3% were users, 36.7% were non users. Among the ones preferring old technology, 10% were using mobile payment system, 90% were not using. According to the result, 68.3% of the sample was using mobile payment system, whereas 31.7% were not using.

**Table 4.51: Chi-square test for use and personal innovativeness**  
**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	83.898 <sup>a</sup>	3	.000

Likelihood Ratio	84.443	3	.000
Linear-by-Linear Association	68.750	1	.000
N of Valid Cases	400		

0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.70.

H<sub>0</sub>7b-There is no association between the use of mobile payment system and personal innovativeness of the consumer.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the use of the mobile payment system and personal innovativeness of the consumer.

#### 4.2.7.8 Association between Awareness and Use of Mobile Payment Systems

**Table 4.52: Chi-square test for awareness and use**

Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	82.451 <sup>a</sup>	1	.000	.000	.000
Continuity Correction <sup>b</sup>	79.035	1	.000		
Likelihood Ratio	87.832	1	.000		
Fisher's Exact Test					
Linear-by-Linear Association	82.245	1	.000		
N of Valid Cases	400				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.11.

b. Computed only for a 2x2 table

Since the p- value .000 is less than the significance value .05, we can conclude that there is association between the awareness about the mobile payment system and use of mobile payments system among consumers.

#### **4.2.8 Hypothesis testing for demographic factors affecting continued use of the mobile payment systems**

##### **4.2.8.1 Impact of City on Continued use of Mobile Payment Systems**

Independent t-test was done to find out the impact of city on continued use of mobile payment. City was taken as the categorical independent variable and continued use of mobile payment system as the dependent variable. For this purpose, respondents were divided into two groups; a) Ranchi & b) Kolkata.

**Table 4.53: Group Statistics of consumers' city**

**Group Statistics**

<b>City</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
I will continue using Ranchi	129	4.047	.8087	.0712
mobile payment in Kolkata	144	3.840	.6862	.0572
future				

**Table 4.54: T-test analysis for consumer respondents' city**

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2- tailed)
I will Equal continue variances using mobile assumed payment in Equal future variances not assumed	2.285	.132	2.279	271	.023
			2.258	252.371	.025

H<sub>0</sub>1c-There is no significant difference in the continued use of mobile payment system and city of the consumer.

There was significant difference in scores for Ranchi (M=4.05, SD=.809) and Kolkata (M=3.84, SD=.686);  $t(271) = 2.28$ ,  $p = .023$ . Since  $p = 0.023$  is less than  $\alpha = 0.05$ , the null hypothesis is rejected. That means there is significant difference in the continued use of mobile payment system and city of the consumer.

#### **4.2.8.2 Impact of Gender on Continued use of Mobile Payment Systems**

Independent t-test was done to find out the impact of gender on continued use of mobile payment. Gender was taken as the categorical independent variable

and continued use of mobile payment system as the dependent variable. For this purpose, respondents were divided into two groups; a) Male & b) Female.

**Table 4.55: Group Statistics of consumers' gender**

Group Statistics				
Gender	N	Mean	Std. Deviation	Std. Error Mean
I will continue using mobile payment in future	187	3.866	.7608	.0556
Male	86	4.093	.7134	.0769
Female				

**Table 4.56: T-test analysis for consumer respondents' gender**

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
I will continue using mobile payment in future	.283	.595	2.332	271	.020
Equal variances assumed					
Equal variances not assumed			2.388	175.265	.018

H<sub>0</sub>2c-There is no significant difference in the continued use of mobile payment system and gender of the consumer.

There was significant difference in scores for males (M=3.87, SD=.76) and females (M=4.09, SD=.71);  $t(271) = 2.33$ ,  $p=.020$ . Since  $p = 0.020$  is more than  $\alpha = 0.05$ , the null hypothesis is rejected. That means there is significant

difference in the continued use of mobile payment system and gender of the consumer.

#### 4.2.8.3 Impact of Age on Continued use of Mobile Payment Systems

One way ANOVA test was done to explore the impact of age group on use of mobile payment. Age of the respondents was taken as the categorical independent variable. Subjects were divided into four groups; a) 15 to 25yrs, b) 26 to 40yrs, c) 41 to 60yrs and d) 61 and above yrs, and use of mobile payment was taken the continuous dependent variable.

**Table 4.57: Group Statistics of consumers' age**

**Group Statistics**

	N	Mean	Std. Deviation	Std. Error
15 to 25 yrs	90	4.033	.7854	.0828
26 to 40 yrs	143	3.916	.7552	.0632
41 to 60 yrs	36	3.806	.6684	.1114
Above 61 yrs	4	3.750	.5000	.2500
Total	273	3.938	.7523	.0455

**Table 4.58: Test of Homogeneity of Variances**

Levene			
Statistic	df1	df2	Sig.
.099	3	269	.961

Since the significance value is .961, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.59: One way ANOVA analysis for consumer respondents' age**

**ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.659	3	.553	.977	.404
Within Groups	152.282	269	.566		
Total	153.941	272			

H<sub>0</sub>3c-There is no significant difference in the continued use of mobile payment system and age of the consumer.

There was no statistically significant difference at the  $p < .05$  level in the scores for all 4 age groups [ $F(3, 269) = .98, p = .40$ ]. Since  $p = 0.404$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means use of mobile payment is not significantly influenced by age group.

#### **4.2.8.4 Impact of Educational qualification on Continued use of Mobile Payment Systems**

One way ANOVA test was done to explore the impact of educational qualification on use of mobile payment. Educational qualification of the respondents was taken as the categorical independent variable, which was divided into four groups; a) below inter, b) intermediate, c) graduate and d) post graduate or higher. Use of mobile payment was taken as the continuous dependent variable.

**Table 4.60: Descriptives of consumers' educational qualification****Descriptives**

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error</b>
Below intermediate	13	4.000	.7071	.1961
Intermediate	31	3.774	.8450	.1518
Graduate	167	3.970	.7479	.0579
PG and above	62	3.919	.7310	.0928
Total	273	3.938	.7523	.0455

**Table 4.61: Test of Homogeneity of Variances**

Levene Statistic	df1	df2	Sig.
.324	3	269	.808

Since the significance value is .808, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.62: One way ANOVA analysis for consumer respondents' educational qualification****ANOVA**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between Groups	1.075	3	.358	.631	.596
Within Groups	152.866	269	.568		



Total	153.941	272			
-------	---------	-----	--	--	--

H<sub>0</sub>4c-There is no significant difference in the continued use of mobile payment system and educational qualification of the consumer.

There was no statistically significant difference at the  $p < .05$  level in the scores for the qualification groups [ $F(3, 269) = 0.63, p = .6$ ]. Since  $p = 0.596$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means, use of mobile payment is not influenced by educational qualification of the respondents.

#### 4.2.8.5 Impact of Occupation on Continued use of Mobile Payment Systems

One way ANOVA test was done to explore the impact of occupation on use of mobile payment. Occupation was taken as the categorical independent variable, for which the respondents were divided into seven groups a) student, b) businessman, c) occupational, d) Government employee, e) Private employee, f) Housewife and g) Unemployed. Use of mobile payment was taken the continuous dependent variable.

**Table 4.63: Group Statistics of consumers' occupation**

	N	Mean	Std. Deviation	Std. Error
Student	53	3.981	.7719	.1060
Businessman	63	3.937	.7378	.0929
Occupational	31	3.903	.7002	.1258
Govt employee	28	4.036	.7445	.1407
Pvt employee	82	3.841	.7930	.0876
Housewife	12	4.333	.4924	.1421
Unemployed	4	3.750	.9574	.4787
Total	273	3.938	.7523	.0455

**Table 64: Test of Homogeneity of Variances**

Levene Statistic	df1	df2	Sig.
.403	6	266	.876

Since the significance value is .876, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.65: One way ANOVA analysis for consumer respondents' occupation**

**ANOVA**

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between Groups	3.185	6	.531	.936	.469
Within Groups	150.757	266	.567		
Total	153.941	272			

H<sub>05c</sub>-There is no significant difference in the continued use of mobile payment system and occupation of the consumer.

There was no statistically significant difference at the  $p < .05$  level in the scores for all occupation groups [ $F(6, 266) = .94, p = .47$ ]. Since  $p = 0.469$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means, use of mobile payment is not influenced by the respondents' occupation.

#### **4.2.8.6 Impact of Income on Continued use of Mobile Payment Systems**

One way ANOVA test was done to explore the impact of income on use of mobile payment system. Income was taken as the categorical independent variable, for this respondents were divided into five groups; a) below Rs. 10000, b) Rs.10,001 -30,000 , c) Rs. 30,001- 50,000, d) Rs. 50,001-

1,00,000 and e) above Rs. 1,00,00. Use of mobile payment systems was taken as the continuous dependent variable.

**Table 4.66: Group Statistics of consumers' income**

Descriptives				
	N	Mean	Std. Deviation	Std. Error
Upto Rs. 10k	76	3.987	.7745	.0888
Rs. 10k-30k	80	4.000	.7116	.0796
Rs. 30k-50k	54	4.019	.7646	.1040
Rs. 50k-1lakh	42	3.738	.7345	.1133
Above Rs. 1lakh	21	3.714	.7838	.1710
Total	273	3.938	.7523	.0455

**Table 4.67: Test of Homogeneity of Variances**

Levene Statistic	df1	df2	Sig.
.784	4	268	.537

Since the significance value is .537, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.68: One way ANOVA analysis for consumer respondents' income**

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.568	4	.892	1.590	.177
Within Groups	150.373	268	.561		

Total	153.941	272			
-------	---------	-----	--	--	--

H<sub>06c</sub>-There is no significant difference in the continued use of mobile payment system and income of the consumer.

There was no statistically significant difference at the  $p < .05$  level in the scores for all income groups [ $F(4, 268) = 1.6, p = .18$ . Since  $p = 0.177$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means, use of mobile payment is not influenced by the income of the respondents.

#### 4.2.8.7 Impact of Personal innovativeness on Continued use of Mobile Payment Systems

One way ANOVA test was done to explore the impact of personal innovativeness on use of mobile payment. Personal innovativeness was taken as the categorical independent variable, for this respondents were divided into four groups; a) first to use, b) wait for others to use, c) among late users and d) prefer to use older technology. Use of mobile payment was taken the continuous dependent variable.

**Table 4.69: Group Statistics of consumers' personal innovativeness**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
First to use	94	3.894	.7961	.0821	3.731	4.057

Wait for others to use	118	3.915	.7230	.0666	3.783	4.047
Among late users	57	4.070	.7526	.0997	3.870	4.270
Prefer older technology	4	3.750	.5000	.2500	2.954	4.546
Total	273	3.938	.7523	.0455	3.848	4.027

**Table 4.70: Test of Homogeneity of Variances**

Levene Statistic	df1	df2	Sig.
.226	3	269	.878

Since the significance value is .878, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.71: One way ANOVA analysis for consumer respondents' personal innovation**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.383	3	.461	.813	.488
Within Groups	152.558	269	.567		
Total	153.941	272			

H<sub>07c</sub>-There is no significant difference in the continued use of mobile payment system and personal innovativeness of the consumer.

There was no statistically significant difference at the  $p < .05$  level in the scores for TAP groups [ $F(3,269) = .81, p = .49$ ]. Since  $p = 0.488$  is more than  $\alpha = 0.05$ , the null hypothesis is rejected. That means, use of mobile payment is influenced by the technology inclination of the respondents.

#### **4.2.9 Hypothesis testing for finding the impact of the other factors on the continued use of the mobile payment systems through regression**

##### **Usefulness**

H<sub>08</sub>- Usefulness will not significantly influence the continued use of mobile payment system by the consumer

##### **Ease of Use**

H<sub>09</sub>- Ease of Use will not significantly influence the continued use of mobile payment system by the consumer

##### **Social Influence**

H<sub>010</sub>- Social Influence will not significantly influence the continued use of mobile payment system by the consumer

##### **Application Provider**

H<sub>011</sub>- Application Provide will not significantly influence the continued use of mobile payment system by the consumer

##### **Government Initiatives**

H<sub>012</sub>- Government Initiatives will not significantly influence the continued use of mobile payment system by the consumer

**Table 4.72: Correlation of all independent and dependent variables**

		<b>Correlations</b>					
		I will continue using mobile payment in future	SI	GOVT	U	EOU	APP
Pearson Correlation	I will continue using mobile payment in future	1.000	.598	.574	.637	.621	.594
	SI	.598	1.000	.565	.492	.563	.567
	GOVT	.574	.565	1.000	.487	.509	.603
	U	.637	.492	.487	1.000	.726	.521
	EOU	.621	.563	.509	.726	1.000	.530
	APP	.594	.567	.603	.521	.530	1.000
Sig. (1-tailed)	I will continue using mobile payment in future	.	.000	.000	.000	.000	.000
	SI	.000	.	.000	.000	.000	.000
	GOVT	.000	.000	.	.000	.000	.000
	U	.000	.000	.000	.	.000	.000
	EOU	.000	.000	.000	.000	.	.000
	APP	.000	.000	.000	.000	.000	.
N	I will continue using mobile payment in future	273	273	273	273	273	273
	SI	273	273	273	273	273	273
	GOVT	273	273	273	273	273	273
	U	273	273	273	273	273	273
	EOU	273	273	273	273	273	273
	APP	273	273	273	273	273	273

**Table 4.73: Model summary**

Model Summary <sup>b</sup>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756 <sup>a</sup>	.571	.563	.4974

a. Predictors: (Constant), APP, U, SI, GOVT, EOU

b. Dependent Variable: I will continue using mobile payment in future

Model summary shows R-value as 0.756, which means there is good correlation between dependent and independent variable. R-square=0.571, which means that 57.1% of the variance in the continued use of mobile payment can be explained by all the independent variables. That means, continued use of mobile payment is strongly predicted by all the independent variables.

**Table 4.74: ANOVA test**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	87.886	5	17.577	71.048	.000 <sup>b</sup>
	Residual	66.056	267	.247		
	Total	153.941	272			

a. Dependent Variable: I will continue using mobile payment in future

b. Predictors: (Constant), APP, U, SI, GOVT, EOU

ANOVA table shows the p-value as 0.00, therefore the result is significant as the p-value is less than significant value 0.05. Also F-ratio value is 71, which is considered as good.



**Table 4.75: Coefficients**

<b>Coefficients<sup>a</sup></b>					
	Unstandardized Coefficients	Standardized Coefficients			
Model	B	Std. Error	Beta	t	Sig.
(Constant)	.480	.196		2.451	.015
SI	.166	.045	.201	3.691	.000
GOVT	.134	.048	.153	2.815	.005
PU	.294	.065	.272	4.513	.000
PEOU	.143	.064	.141	2.235	.026
APP	.173	.056	.171	3.082	.002

a. Dependent Variable: I will continue using mobile payment in future

All the null hypothesis is rejected as the significance value is less than 0.05 for all independent variable. This shows that all the independent variables (usefulness, ease of use, social influence, application provider and government initiatives) have a significant positive relationship with the continued use of mobile payment.

### 4.3 Merchant Analysis

#### 4.3.1 Demographic profile of the respondents

**Table 4.76: Demographic profile of merchants**

<b>Characteristics</b>	<b>Profile</b>	<b>Ranchi</b>		<b>Kolkata</b>		<b>Total frequency</b>
		<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>	
Gender	Male	86	86	83	83	169
	Female	14	14	17	17	31

Age	15 to 25yrs	9	9	9	9	18
	26 to 40 yrs	54	54	36	36	90
	41 to 60 yrs	33	33	44	44	77
	Above 60 yrs	4	4	11	11	15
Education	Below intermediate	1	1	12	12	13
	Intermediate	15	15	21	21	36
	Graduate	79	79	61	61	140
	PG & above	5	5	6	6	11
When a new technology is introduced in the market	I am usually among the first to use	17	17	17	17	34
	I wait for others to use first	51	51	33	33	84
	I am among late users	27	27	13	13	40
	I prefer using old technology only	5	5	37	37	42

Do you keep your business updated with latest technology	Yes	62	62	19	19	81
	No	38	38	81	81	119

The above table depicts that in Ranchi, 86% of respondents are male and 14% are female respondents. In case of the age of the respondents, the table shows that 54% in the age group of 26 to 40 yrs, 33% in the age group 41 to 60 yrs, 9% of respondents are in the age groups of 15 to 25 yrs, and only 4% are in the age group of above 60. Regarding the education of the respondents, 79% had completed graduation 15% of the respondents had done intermediate, 5% have PG & above degrees, and only 1% are below intermediate. Personal innovativeness profile suggest, 51% are the ones wait for others to use first, 27% are late users, 17% of respondents are usually among the first ones to use, and only 5% preferred using old technology only.

In Kolkata, 83% of respondents are male and 17% are female respondents. In case of the age of the respondents, the table shows that 44% in the age group 41 to 60 yrs, 36% in the age group of 26 to 40 yrs, 11% are in the age group of above 60, and only 9% of respondents are in the age groups of 15 to 25 yrs. With respect to the education of the respondents, 61% had completed graduation, 21% of the respondents had done intermediate, 12% are below intermediate, and 6% have PG & above degrees. Regarding Personal innovativeness, 37% preferred using old technology, 33% are the ones wait for others to use first, 17% of respondents are usually among the first ones to use, and 13% are late users.

#### 4.3.1.1 Business Profile of the merchants

**Table 4.77: Business profile of merchants**

	<b>Ranchi</b>				<b>Kolkata</b>				
<b>Profile</b>	<b>user</b>	<b>user %</b>	<b>non user</b>	<b>non user %</b>	<b>user</b>	<b>user %</b>	<b>non-user</b>	<b>non-user %</b>	<b>Total Count</b>
electro nics	1	11%	8	89%	2	33%	4	67%	15
food stalls	13	72%	5	28%	21	78%	6	22%	45
footwa re	5	56%	4	44%	2	67%	1	33%	12
garmen ts	6	60%	4	40%	10	83%	2	17%	22
general	8	67%	4	33%	5	63%	3	37%	20
gift	2	100 %	0	0%	5	83%	1	17%	8
medica l	8	67%	4	33%	8	80%	2	20%	22
misc	6	38%	10	62%	5	63%	3	37%	24
mobile	6	100 %	0	0%	9	90%	1	10%	16
service	1	33%	2	67%	4	67%	2	33%	9
station	2	67%	1	33%	3	75%	1	25%	7

ary									
Total	58		42		74		26		200

Small scale retailers from almost all business segments were considered for the study from both the cities. The idea was to get insights of the whole market. So, retailers from food, footwear, garment, gift, medical, mobile and others were included in the study. The distribution of merchants has been shown above.

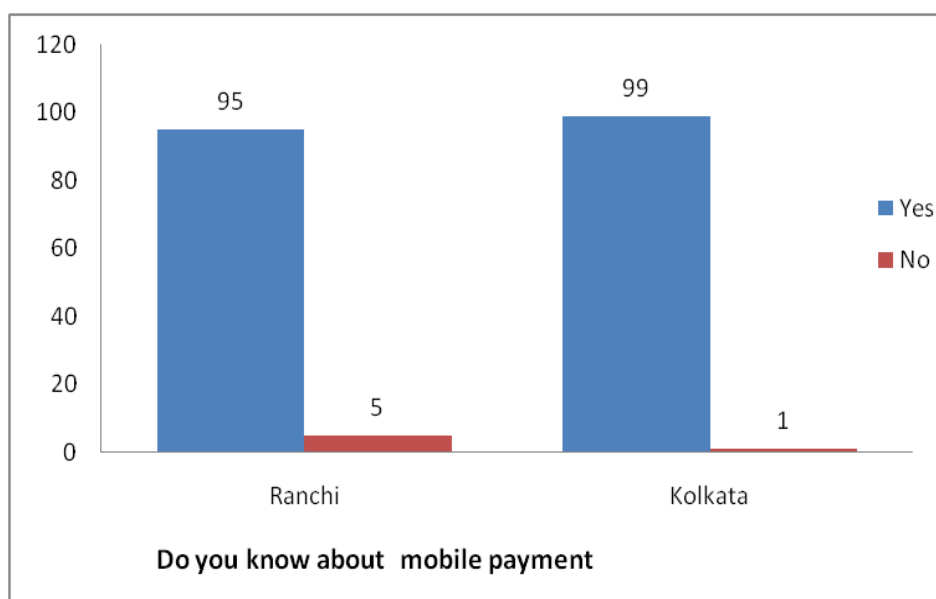
#### **4.3.2 Comparison of level of awareness, adoption and usage of mobile payment systems among merchants of Ranchi and Kolkata city**

##### **4.3.2.1 Awareness about mobile payment system among merchants**

**Table 4.78: Awareness about mobile payment among merchants**

Awareness about mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	95	95%	99	99%
No	5	5%	1	1%
Grand total	100	100%	100	100%

**Figure 4.19: Awareness about mobile payment among merchants**

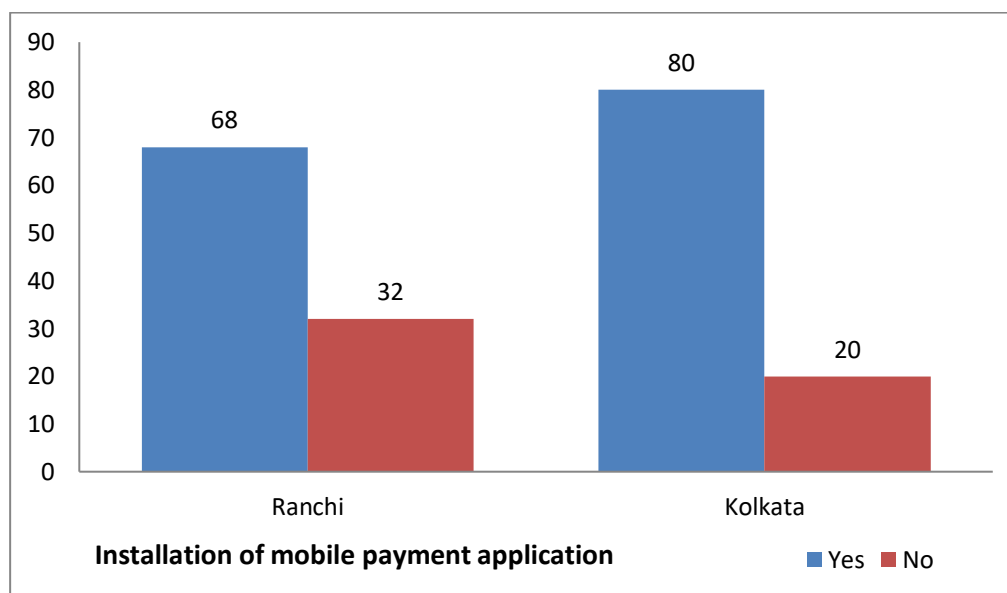


In Ranchi city, it was seen that 95% of the sample population was aware about mobile payment system and 5% were unaware, whereas 99% were aware in Kolkata city and only 1% were unaware.

**Table 4.79: Installation of mobile payment applications among merchants**

Installation of mobile payment application	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	68	68%	80	80%
No	32	32%	20	20%
Grand total	100	100%	100	100%

**Figure 4.20: Installation of mobile payment applications**



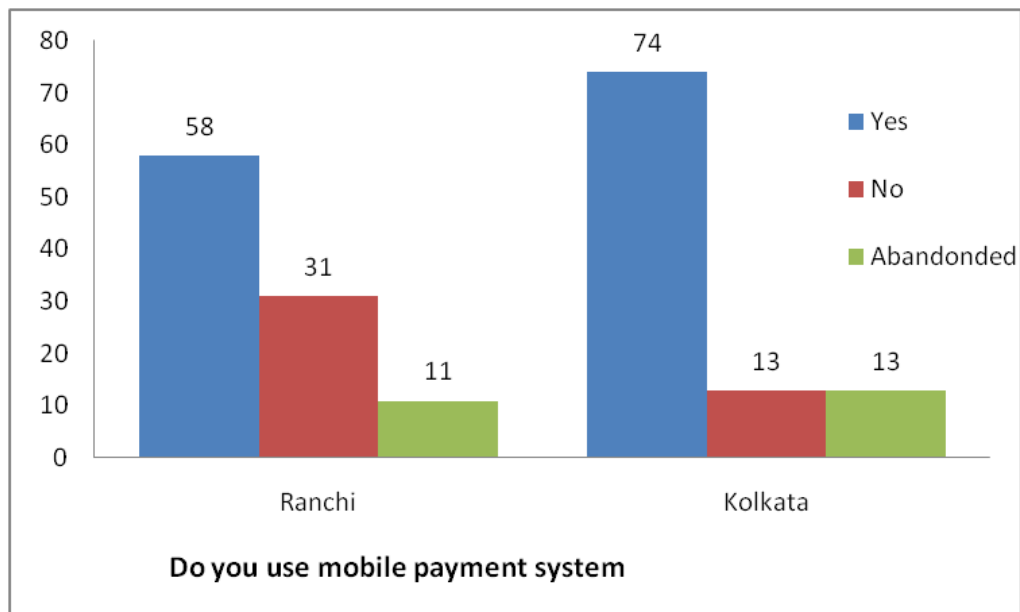
In Ranchi city, 68% of the merchants have installed mobile payment applications in their phone and 32% did not install. In the case of Kolkata city, it was seen that 80% of the merchants have installed mobile payment applications and 20% did not.

#### 4.3.2.2 Use of mobile payment by the merchants

**Table 4.80: Use of mobile payment by merchants**

Use of mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	58	58%	74	74%
No	31	31%	13	13%
Abandoned	11	11%	13	13%
Grand total	100	100%	100	100%

**Figure 4.21: Usage of mobile payment by merchants**



Out of the sample population in Ranchi, 58% were users, 31% were non users and 11% abandoned after using mobile payment system. Out of the sample population in Kolkata, 74% were users, 13% were non users and 13% abandoned after using mobile payment system.

Out of total 200 merchants, 132 were users consisting of 74 users from Kolkata & 58 from Ranchi while 68 were non-users comprising of 42 from Ranchi & 26 from Kolkata.



### 4.3.3 Non User Merchant Analysis

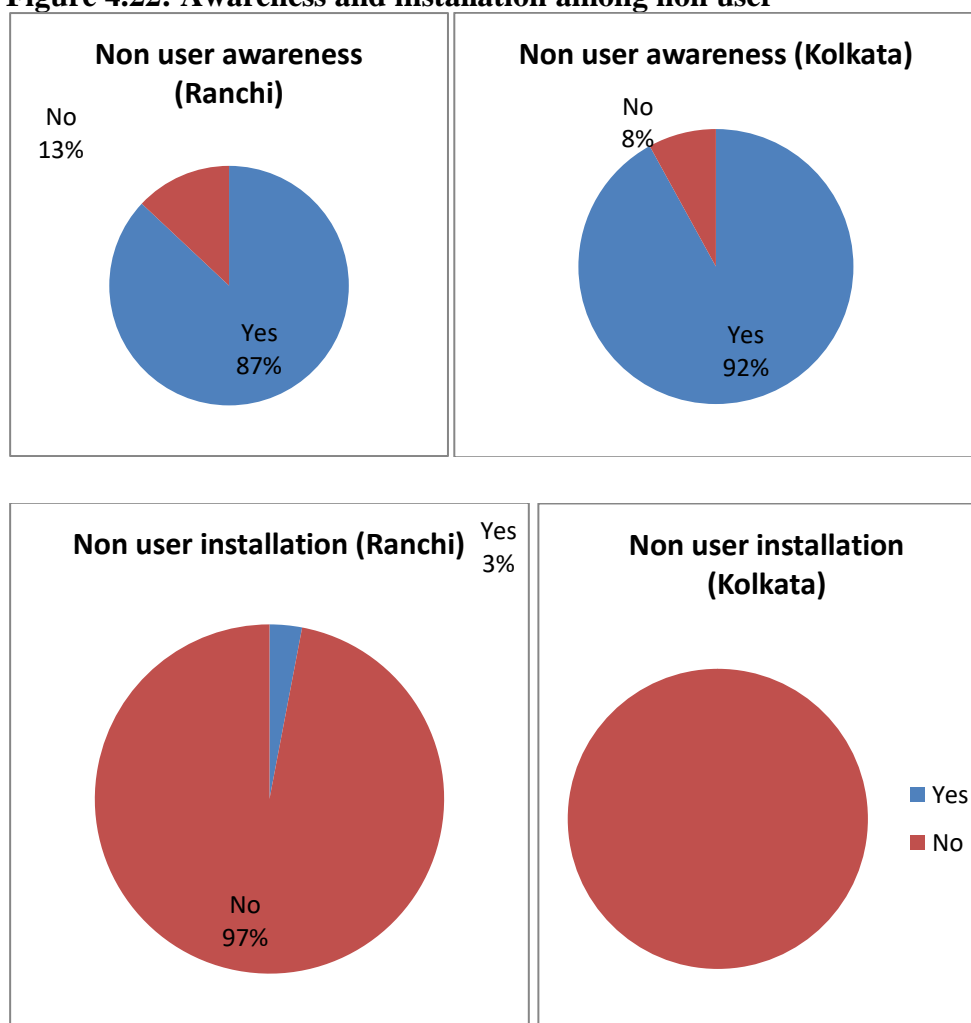
Analysis was done for total of 68 non users and the analysis is shown below.

#### 4.3.3.1 Awareness and installation among non user

**Table 4.81: Awareness and installation among non user**

City	Ranchi				Kolkata			
	Yes		No		Yes		No	
	Frequ ency	Percen tage	Frequ ency	Percen tage	Frequ ency	Percen tage	Frequ ency	Percen tage
Aware ness	27	87	4	13	12	92	1	8
Install ation	1	3	30	97	0	0	13	100

**Figure 4.22: Awareness and installation among non user**



In case of Ranchi, 87% of the total non users are aware about mobile payment system and only 13% of the respondents do not know about Mobile Payment Systems. Regarding, installation of payment apps, 97% of non users do not have any such apps installed in their mobile phones while only 3% of non users have some kind of mobile payment apps installed in their phones.

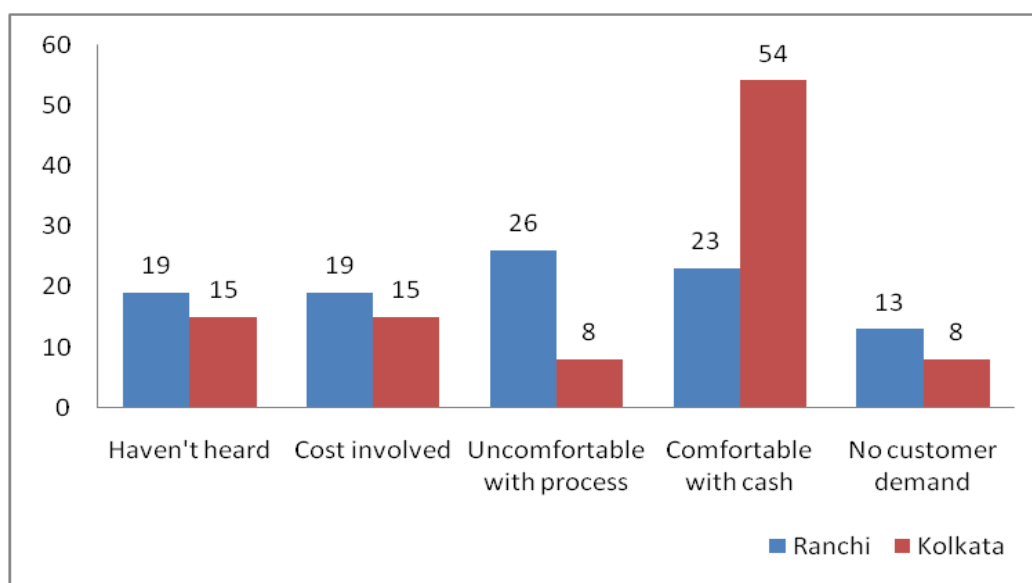
Whereas, in case of Kolkata 92% of the total respondents are aware about mobile payment system and only 8% of the respondents do not know about Mobile Payment Systems. Regarding, installation of payment apps, 100% of non users do not have any such apps installed in their mobile phones.

#### 4.3.3.2 Reason for not using Mobile Payment Systems

**Table 4.82: Reason for not using mobile payment system**

Reasons	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Haven't heard of MPS	6	19%	2	15%
Cost involved to use	6	19%	2	15%
Not comfortable with MPS	8	26%	1	8%
Comfortable with cash mode only	7	23%	7	54%
No customer demand	4	13%	1	8%
Total	31	100%	13	100%

**Figure 4.23: Reason for not using mobile payment by merchants**



Merchant who do not accept mobile payment systems were asked about reason behind it. Being comfortable with cash is most prominent reason for not using mobile payment in Kolkata with 54% of the non users felt the same as compared to 23% in Ranchi. In Ranchi uncomfortable process of mobile payment was faced by 26% of the non users, whereas in Kolkata only 8% felt the same. No consumer demand, haven't heard and cost involved where other issues due to which merchants were not using mobile payment.

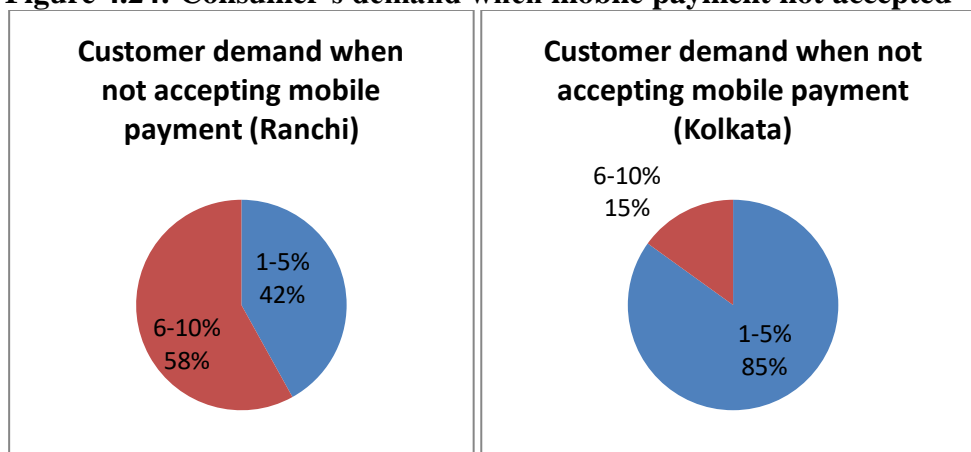
#### **4.3.3.3 Consumer's demand when Mobile Payments Systems is not accepted by the Merchant**

**Table 4.83: Consumer demand when Mobile Payments Systems is not accepted**

Customer demand when not accepting	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
1-5%	13	42	11	85

6-10%	18	58	3	15
Total	31	100	13	100

**Figure 4.24: Consumer's demand when mobile payment not accepted**



In case of Ranchi, 58% of the total non user merchants said that about 6-10% customer demand for mobile payments when they don't accept such payments, and 42% said that 1-5% customer demand for it.

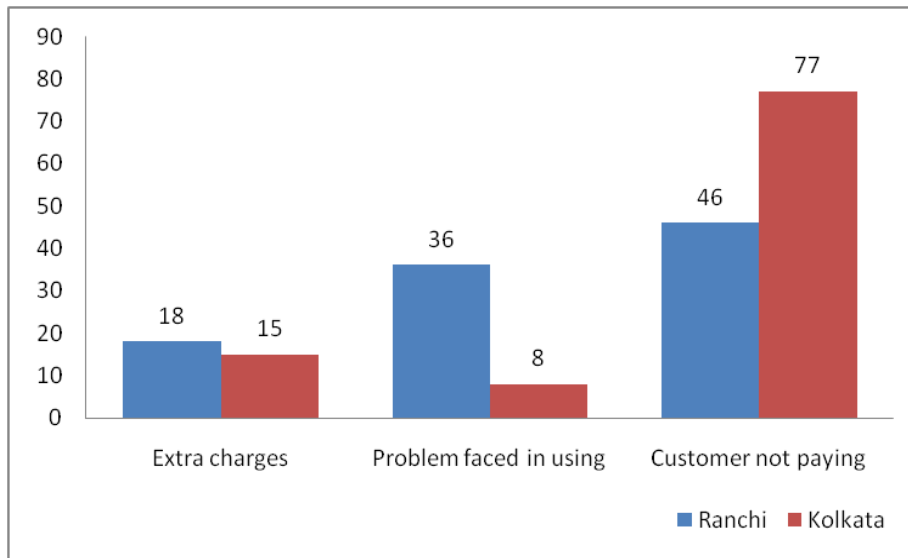
Whereas, in case of Kolkata 85% of the total non user merchants said that about 1-5 % customer demand for mobile payments when they don't accept such payments, while 15% said that 6-10% customer demand for it.

#### 4.3.3.4 Reason for abandoning Mobile Payment Systems

**Table 4.84: Reason for abandoning mobile payment**

City	Ranchi		Kolkata	
Reasons	Frequency	Percentage	Frequency	Percentage
Extra charges	2	18	2	15
Problems faced in using	4	36	1	8
Customer not using	5	46	10	77
Total	11	100	13	100

**Figure 4.25: Reason for abandoning mobile payment**



The merchants who used mobile payment systems before hand and then abandoned later were asked about reason behind it. Consumer not paying through mobile payments is the most important reason due to which merchants have abandoned the mobile payment system in both cities i.e. 46% in Ranchi and 77% in Kolkata city. More merchants in Ranchi faced problem in using mobile payment systems than that in Kolkata as 36% of the Ranchi merchants faced this issue whereas 8% of the Kolkata merchant felt the same. Extra charges had similar impact in both cities.

#### **4.3.4 User Merchant Analysis**

Analysis was done for total of 132 users and the analysis is shown below.

##### **4.3.4.1 Preference in payment option accepted by merchants**

To know about the preference of Mobile Payment System as payment options among the merchants question was asked where respondents were asked to rank their preference from 1 as most preferred to 4 as least preferred. Based on the merchants' responses, observation about both the cities is given below.

**Table 4.85: Payment preference by merchants**

Payment option	Ranchi		Kolkata	
	Mean Rank	Rank	Mean Rank	Rank
Cash	1.14	1	1.22	1
Debit/ Credit card	2.45	2	2.18	2
Net banking	3.83	4	3.23	4
Mobile payment	2.59	3	3.32	3

In case of Ranchi merchants, cash is given the first preference for accepting payments followed by debit/ credit cards, mobile payments is preferred after cards and net banking is the least preferred method.

In case of Kolkata merchants, also cash is given the first preference for accepting payments followed by debit/ credit cards, mobile payments is the third preferred option and net banking is least preferred.

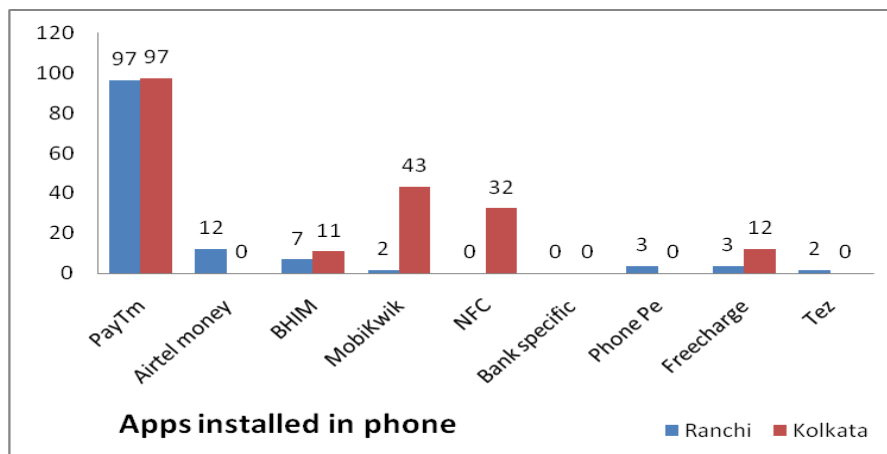
#### **4.3.4.2 Mobile payment application installed by merchants**

Table below exhibits the mobile payment apps installed by merchant to accept payments for their business transactions.

**Table 4.86: Payment application installed by merchants**

Which mobile payment apps have you installed	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
PayTm	56	97%	72	97%
Airtel Money	7	12%	0	0%
BHIM	4	7%	8	11%
MobiKwik	1	2%	32	43%
NFC	0	0%	24	32%
Bank Specific	0	0%	0	0%
PhonePe	2	3%	0	0%
FreeCharge	2	3%	9	12%
Tez	1	2%	0	0%

**Figure 4.26: Payment application installed by merchants**



To know about most accepted Mobile Payment System among Merchants, question was asked about the various Mobile Payments option provided by them to the consumers. PayTm is the most installed and accepted mode among numerous mobile payments options available in both the cities with 97% of the merchants installing it. In Ranchi, apart from PayTm, Airtel Money, BHIM, Mobikwik, Phone Pe, Freecharge and Google Pay are also provided by

few merchants. Whereas in Kolkata few merchants provide options of BHIM, Mobikwik, NFC, Phone Pe, and Freecharge.

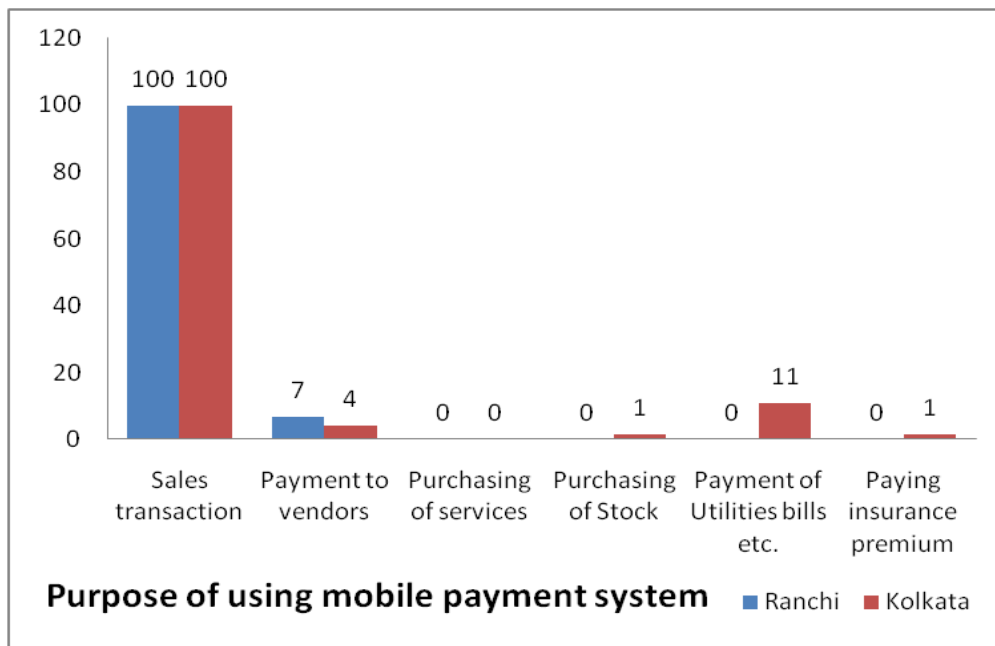
#### 4.3.4.3 Purposes for which mobile payment system is used by merchants

Table below exhibits the purposes for which mobile payment systems is used by the merchants.

**Table 4.87: Purpose of use of mobile payment by merchants**

For what purpose do you use mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Sales transaction	58	100%	74	100%
Payment to vendors	4	7%	3	4%
Purchasing of services	0	0%	0	0%
Purchasing of stock	0	0%	1	1%
Payment of utilities	0	0%	8	11%
Paying insurance premium	0	0%	1	1%

**Figure 4.27: Purpose of use of mobile payment by merchants**





Based on the Question about for what purposes was mobile payment used among by merchants in their business it was revealed that in Ranchi mobile payments were mostly used for sales transactions as 100% respondents uses it for sales transaction. Very few for about 7 % of respondents used it for payments to vendors. None uses it for purchasing of services, purchasing of stocks, payments of utilities and paying insurance premium.

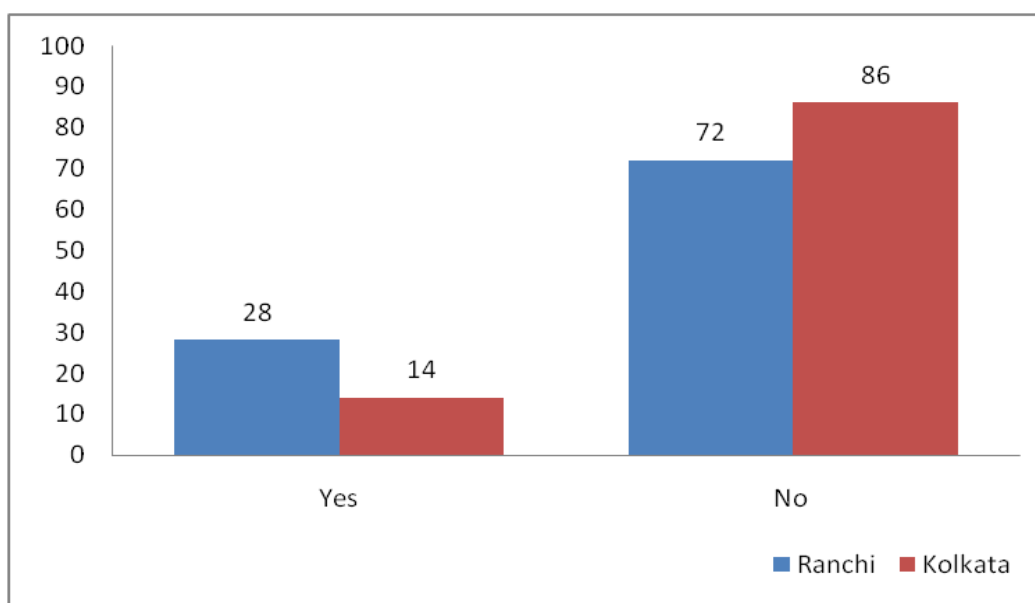
In Kolkata also 100% of respondents use mobile payments for sales transaction followed by payments of utilities of business by 11 % respondents. Payments to vendor is done by only 4 % respondents of Kolkata while only 1 % respondents uses Mobile Payments for purchasing stock and paying insurance premium. None of the merchants uses mobile payment systems for purchasing of services.

#### 4.3.4.4 Feeling of risk while using mobile payment systems

**Table 4.88: Risk feeling in use of mobile payment by merchants**

Do you feel risk while using mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	16	28%	10	14%
No	42	72%	64	86%
Grand total	58	100%	74	100%

**Figure 4.28: Risk feeling in use of mobile payment by merchants**



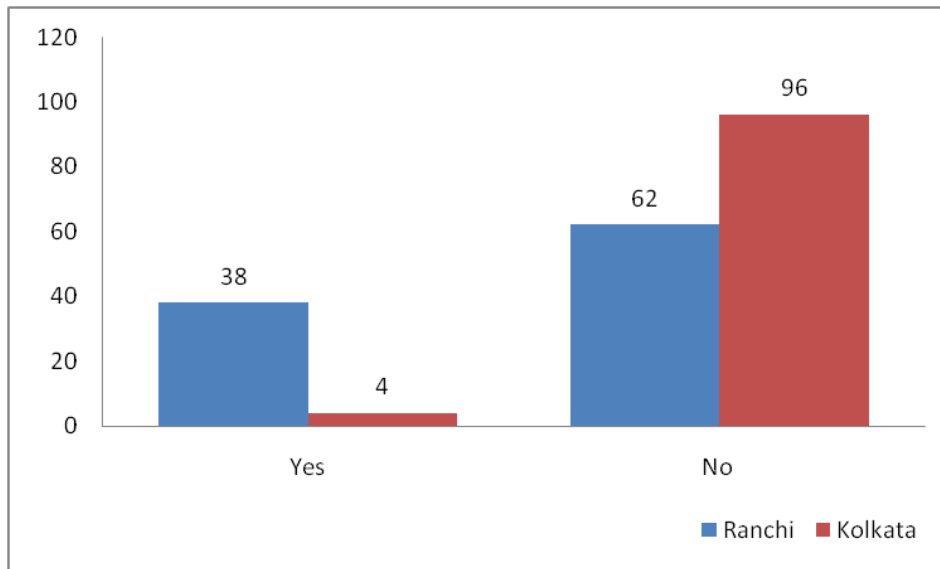
When asked about the feeling of risk in using mobile payment system about 28% of the Ranchi merchants feel risk in using mobile payment systems and rest 72 percent feel no risk. Only 14% of merchants in Kolkata feel risk in using mobile payment systems whereas majority of respondents, for about 86% feel safe in using mobile payment systems.

#### 4.3.4.5 Encouragement by merchants for using mobile payment systems

**Table 4.89: Encouragement to customers for use of mobile payment**

Do you encourage consumer to pay through mobile payment	Ranchi		Kolkata	
	Frequency	Percentage	Frequency	Percentage
Yes	22	38%	3	4%
No	36	62%	71	96%
Grand total	58	100%	74	100%

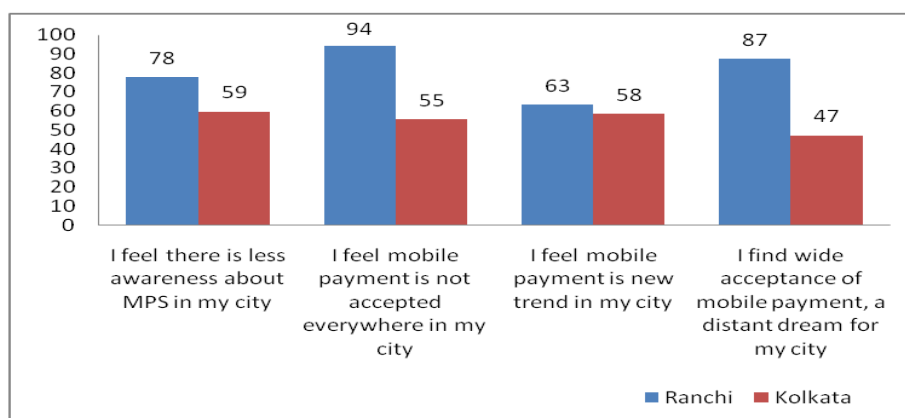
**Figure 4.29: Encouragement for use of mobile payment by merchants**



To know about Merchant role in motivating consumers to use mobile payment systems question was asked about if they encourages payments through mobile payment systems. 38% of Ranchi merchants encourage consumers to pay through mobile payment systems whereas rest 62% does not encourage consumers from their side. In case of Kolkata only 4% merchants encourage through mobile payment systems whereas most of the merchants for about 96 % of them do not encourage such payments on their own.

#### 4.3.4.6 Mobile payment scenario in both the cities

**Figure 4.30: Mobile payment scenario in Ranchi and Kolkata**



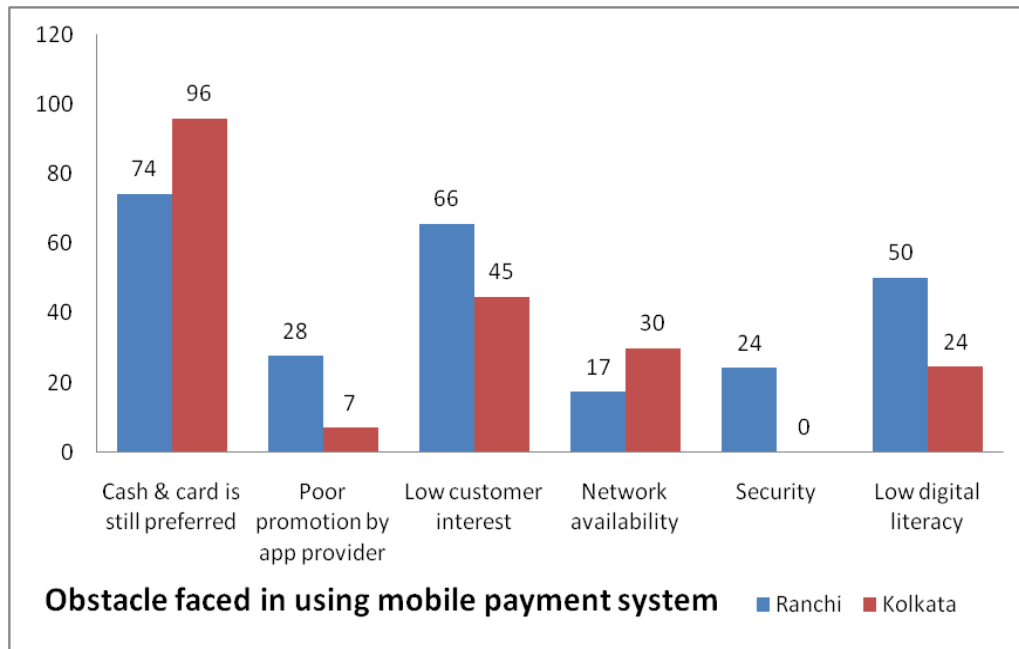
78% of the Ranchi merchants have the feeling of less awareness about mobile payment in the city, whereas only 59% of the Kolkata merchants agree to it. The feeling of mobile payment being not accepted everywhere in the city is among 94% of the Ranchi merchants and only 55% of the Kolkata merchants feel so. Majority of the respondents in both the cities felt that mobile payment is a new trend in their city, with 63% merchants in Ranchi and 58% in Kolkata agreeing to this. About 87% of Ranchi merchants think that mobile payment is a distant dream in their city, while only 47% of Kolkata merchants felt so.

#### **4.3.5 Problems faced by merchants while operating mobile payment systems**

**Table 4.90: Problems in use of mobile payment by merchants**

<b>Problems while using mobile payment</b>	<b>Ranchi</b>		<b>Kolkata</b>	
	<b>Frequency</b>	<b>Percentage</b>	<b>Frequency</b>	<b>Percentage</b>
Cash & card still preferred	43	74%	71	96%
Poor promotion by app provider	16	28%	5	7%
Low consumer interest	38	66%	33	45%
Network availability	10	17%	22	30%
Security	14	24%	0	0%
Low digital literacy	29	50%	18	24%

**Figure 4.31: Problems faced in use of use of mobile payment by merchants**



Preference of cash and card is major obstacle faced by the merchant of both the cities as 74% of the Ranchi merchants and 96% of the Kolkata merchants faced this issue. Low consumer interest (66% for Ranchi and 50% in Kolkata) and low digital literacy (50% in Ranchi and 24% in Kolkata) are next major obstacles faced by merchants.

#### 4.3.6 Results of Factor analysis

As we are analyzing only the users of mobile payment, further analysis is done on 132 respondents, who are users and not total 200.

#### 4.3.6.1 KMO Bartlett's test results

**Table 4.91: KMO Bartlett's test of merchants**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.906
Bartlett's Test of Sphericity	Approx. Chi-Square	1985.193
	Df	231
	Sig.	.000

In the case of merchants, KMO value is 0.906 (which is above 0.6), we have p-value 0.000 (which is  $\leq 0.5$ ), and therefore factor analysis is appropriate.

#### 4.3.6.2 Exploratory Factor Analysis

**Table 4.92: Total variance test of merchants**  
**Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.964	45.291	45.291	9.964	45.291	45.291	6.914	31.425	31.425
2	2.386	10.846	56.137	2.386	10.846	56.137	2.874	13.062	44.487
3	1.359	6.179	62.316	1.359	6.179	62.316	2.869	13.040	57.527
4	1.099	4.995	67.311	1.099	4.995	67.311	2.152	9.783	67.311
5	.877	3.987	71.298						
6	.774	3.520	74.818						

7	.721	3.277	78.095						
8	.633	2.879	80.974						
9	.583	2.649	83.623						
10	.473	2.149	85.772						
11	.461	2.095	87.867						
12	.410	1.866	89.733						
13	.355	1.615	91.347						
14	.320	1.455	92.802						
15	.291	1.324	94.126						
16	.252	1.145	95.270						
17	.237	1.078	96.348						
18	.223	1.014	97.362						
19	.201	.915	98.277						
20	.165	.750	99.026						
21	.116	.527	99.553						
22	.098	.447	100.000						

Extraction Method: Principal Component Analysis.

Percentage of variance as shown above, shows total variance attributed to each factor. Principal components analysis revealed the presence of four components with eigenvalues exceeding 1, explaining 31.43 per cent, 13.06 per cent, 13.04 per cent and 9.78 per cent of the variance respectively.

**Table 4.93: Rotated component matrix of merchants**

**Rotated Component Matrix<sup>a</sup>**

	Component			
	1	2	3	4
To keep out of change issue (v1)	.729	.060	.290	.257
The problem of accepting card in case of small penny transaction is now resolved by mobile payment (v2)	.799	.112	.203	.101
It has reduced time in processing payment (v3)	.811	.032	.319	.158
It has made money transfer very easy (v4)	.776	.081	.291	.105
Very useful during rush hours (v5)	.664	.104	.179	.250
To avoid card transaction failures (v6)	.774	.094	.174	.196
It helps me to go digital, without paying PoS terminal charges to bank (v7)	.812	.164	.269	.124
It adds on to my business sales volume (v8)	.433	.036	.219	.433
It was easy for me to adapt mobile payment (v9)	.663	.351	.173	-
				.005
Receiving money through mobile payment is very easy (v10)	.789	.342	.200	-
				.047
I find it very convenient as I don't have to handle cash or swipe card (v11)	.768	.290	.263	.041
My customers insist to pay through it (v12)	.309	.025	.156	.699
To give customer an extra payment option (v13)	.095	.351	-	.737
			.033	
I don't want lose customers to other merchants (v14)	-	.308	.110	.746
	.014			
I feel merchant technical- support of mobile payment system is appropriate (v15)	.257	.745	.224	.118
I have full trust on my mobile payment app provider (v16)	.233	.778	.116	.190
I am fully satisfied from the current offerings by app provider (v17)	.200	.722	-	.145
			.001	
I feel that per day/month limit should be increased (v18)	-	.701	.017	.151
	.011			
I accept mobile payment to support cashless India (v19)	.533	.124	.669	.076
I accept mobile payment to curb black money (v20)	.440	.193	.712	.039
I have started accepting mobile payment after demonetisation (v21)	.348	-	.785	.139
		.051		
I still think government should give more relaxation to merchant community for accepting mobile payment (v22)	.284	.178	.751	.149



Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Interpretation – From the above table, it is found that v1, v2, v3, v4, v5, v6, v7, v8, v9, v10 & v11 show more loadings under the first component and thus it can be named as Usability Factors. These are the variables that have utility on use of mobile payment system. Similarly, v15, v16, v17 & v18 show more loadings under the second component and thus it can be named as Application Providers Factors. Likewise, v19, v20, v21 & v22 have more loadings under the third component and thus it can be named as Government Initiatives Factors. It was further found that v12, v13 & v14 have more loadings under the fourth component and thus it can be named as Consumer Influence. So total of four factors were extracted.

#### 4.3.7 Reliability Analysis

Cronbach's alpha was used to check the reliability of all the factors taken in the questionnaire and to check the internal consistency within each factor. The factors with Cronbach's value equal to or greater than 0.7, are considered as reliable and shall be considered for further analysis. The Cronbach's alpha value of the items of each factor is mentioned below.

**Table 4.94: Cronbach's alpha value of merchant responses**

S.No.	Description	Cronbach's Alpha value
Usability	I accept mobile payment to keep out of change issue	0.943
	The problem of accepting card in case of small penny transaction is	

	now resolved by mobile payment	
	I accept mobile payment because it has reduced time in processing payment	
	I use mobile payment as it has made money transfer very easy	
	I find mobile payment very useful during rush hours	
	I accept mobile payment to avoid card transaction failures	
	I accept mobile payment as it helps me to go digital, without paying PoS terminal charges to bank	
	I accept mobile payment as it adds on to my business sales volume	
	I accept mobile payment because it was easy for me to adapt mobile payment systems	
	I accept mobile payment because receiving money through mobile payment is very easy	
	I accept mobile payment because I find it very convenient as I don't have to handle cash or swipe card	
Consumer influence	I accept mobile payment because my consumers insist to pay through it	0.720
	I accept mobile payment to give consumer an extra payment option	
	I accept mobile payment so that I don't lose consumers to other merchants	
Application provider	I feel merchant technical- support of mobile payment system is appropriate	0.792
	I have full trust on my mobile	

	payment app provider	
	I am fully satisfied from the current offerings by app provider	
	I feel that per day/month limit should be increased	
Government initiative	I accept mobile payment to support cashless India	0.866
	I accept mobile payment to curb black money	
	I have started accepting mobile payment after demonetisation	
	I still think government should give more relaxation to merchant community for accepting mobile payment	

#### 4.3.8 Hypothesis testing for finding association between demographic variables and awareness about mobile payment systems among merchant

##### 4.3.8.1 Association between City and Awareness about Mobile Payment Systems

**Table 4.95: Cross tabulation for awareness and city**

City \* Awareness Crosstabulation

			Awareness		Total
			Yes	No	
City	Ranchi	Count	95	5	100
		Expected Count	97.0	3.0	100.0
		% within City	95.0%	5.0%	100.0%

Total	Kolkata	% within Awareness	49.0%	83.3%	50.0%
		% of Total	47.5%	2.5%	50.0%
		Count	99	1	100
		Expected Count	97.0	3.0	100.0
		% within City	99.0%	1.0%	100.0%
		% within Awareness	51.0%	16.7%	50.0%
	Total	% of Total	49.5%	0.5%	50.0%
		Count	194	6	200
		Expected Count	194.0	6.0	200.0
		% within City	97.0%	3.0%	100.0%
		% within Awareness	100.0%	100.0%	100.0%
		% of Total	97.0%	3.0%	100.0%

95% of Ranchi respondents were aware of what mobile payment system is, while 5% did not know that payment can be made through their mobile phone. In case of Kolkata city, 99% of the respondents knew about mobile payment system, whereas 1% did not know about mobile payment.

**Table 4.96: Chi square test for awareness and city**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	2.749 <sup>a</sup>	1	.097		
Continuity Correction <sup>b</sup>	1.546	1	.214		
Likelihood Ratio	2.994	1	.084		
Fisher's Exact Test				.212	.106
Linear-by-Linear Association	2.735	1	.098		
N of Valid Cases	200				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 3.00.

b. Computed only for a 2x2 table

H<sub>0</sub>13a-There is no association between the awareness about the mobile payment system and city of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .214 is larger than the alpha value of .05, so we can conclude that our result is not significant. This means that the proportion of Ranchi's merchants that are aware about the mobile payment system is not significantly different

from the proportion of Kolkata's merchants that are aware about the mobile payment system.

#### 4.3.8.2 Association between Gender and Awareness about Mobile Payment Systems

**Table 4.97: Cross tabulation for awareness and gender**

##### **Gender \* Awareness Crosstabulation**

			Awareness		Total
			Yes	No	
Gender	Male	Count	165	4	169
		Expected Count	163.9	5.1	169.0
		% within Gender	97.6%	2.4%	100.0%
		% within Awareness	85.1%	66.7%	84.5%
		% of Total	82.5%	2.0%	84.5%
	Female	Count	29	2	31
		Expected Count	30.1	.9	31.0
		% within Gender	93.5%	6.5%	100.0%
		% within Awareness	14.9%	33.3%	15.5%
		% of Total	14.5%	1.0%	15.5%
Total	Count		194	6	200
	Expected Count		194.0	6.0	200.0
	% within Gender		97.0%	3.0%	100.0%
	% within Awareness		100.0%	100.0%	100.0%

% of Total	97.0%	3.0%	100.0%
------------	-------	------	--------

97.6% of the total males were aware about mobile payment system, while 2.4% were unaware. For females, 93.5% were aware while, 6.5% were aware about mobile payment system. According to the result, 97% of the sample was aware about mobile payment system, whereas 3% were unaware.

**Table 4.98: Chi square test for awareness and gender**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	1.502 <sup>a</sup>	1	.220		
Continuity Correction <sup>b</sup>	.426	1	.514		
Likelihood Ratio	1.212	1	.271		
Fisher's Exact Test				.234	.234
Linear-by-Linear Association	1.494	1	.222		
N of Valid Cases	200				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is .93.

b. Computed only for a 2x2 table

H<sub>0</sub>14a-There is no association between the awareness about the mobile payment system and gender of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .514 is larger than the alpha value of .05, so we can conclude that our result is not significant. This means that the proportion of male that are aware about the mobile payment system is not significantly different from the proportion of female that are aware about the mobile payment system.

#### 4.3.8.3 Association between Age and Awareness about Mobile Payment Systems

**Table 4.99: Group statistics of merchants' age**

	N	Mean	Std. Deviation	Std. Error
15 to 25 yrs	11	3.455	.9342	.2817
26 to 40 yrs	65	3.523	.6871	.0852
41 to 60 yrs	50	3.440	.6749	.0954
Above 61 yrs	6	3.167	.7528	.3073
Total	132	3.470	.7037	.0613

**Table 4.100: Cross tabulation for awareness and age**

#### Age \* Awareness Crosstabulation

				Awareness		Total
				Yes	No	
Age	15 to 25	Count		17	1	18
	yrs	Expected Count		17.5	.5	18.0



	% within Age	94.4%	5.6%	100.0%
	% within Awareness	8.8%	16.7%	9.0%
	% of Total	8.5%	0.5%	9.0%
26 to 40 yrs	Count	89	1	90
	Expected Count	87.3	2.7	90.0
	% within Age	98.9%	1.1%	100.0%
	% within Awareness	45.9%	16.7%	45.0%
	% of Total	44.5%	0.5%	45.0%
41 to 60 yrs	Count	75	2	77
	Expected Count	74.7	2.3	77.0
	% within Age	97.4%	2.6%	100.0%
	% within Awareness	38.7%	33.3%	38.5%
	% of Total	37.5%	1.0%	38.5%
Above 61 yrs	Count	13	2	15
	Expected Count	14.6	.5	15.0
	% within Age	86.7%	13.3%	100.0%
	% within Awareness	6.7%	33.3%	7.5%
	% of Total	6.5%	1.0%	7.5%
Total	Count	194	6	200

Expected Count	194.0	6.0	200.0
% within Age	97.0%	3.0%	100.0%
% within Awareness	100.0%	100.0%	100.0%
% of Total	97.0%	3.0%	100.0%

In case of age group of 15 to 25yrs about 94.4% were aware about mobile payment system and 5.6% were unaware. In case of age group of 26 to 40 yrs 98.9% were aware about mobile payment system and 1.1% were unaware. In case of age group of 41 to 60 yrs about 97.4% were aware about mobile payment system and 2.6% were unaware. In case of age group of above 61 yrs about 86.7% were aware about mobile payment system and 13.3% were unaware. According to the result, 97% of the sample was aware about mobile payment system, whereas 3% were unaware.

**Table 4.101: Chi square test for awareness and age**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.054 <sup>a</sup>	3	.070
Likelihood Ratio	4.854	3	.183
Linear-by-Linear Association	1.609	1	.205
N of Valid Cases	200		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .45.

H<sub>0</sub>15a- There is no association between the awareness about the mobile payment system and age of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .070 is *larger* than the alpha value of .05, so we can conclude that our result is significant. This means that there is *no* association between the awareness about the mobile payment system and age of the merchant.

#### 4.3.8.4 Association between Educational qualification and Awareness about Mobile Payment Systems

**Table 4.102: Group statistics of merchants' educational qualification**

	N	Mean	Std. Deviation	Std. Error
Below intermediate	4	2.750	.5000	.2500
Intermediate	19	3.263	.7335	.1683
Graduate	101	3.515	.6872	.0684
PG and above	8	3.750	.7071	.2500
Total	132	3.470	.7037	.0613

**Table 4.103: Cross tabulation for awareness and qualification**

#### Qualification \* Awareness Crosstabulation

			Awareness		Total
			Yes	No	
Qualification	Below intermediate	Count	12	1	13
		Expected Count	12.6	.4	13.0
		% within Qualification	92.3%	7.7%	100.0%

Intermediate	n			
	% within Awareness	6.2%	16.7%	6.5%
	% of Total	6.0%	0.5%	6.5%
	Count	34	2	36
	Expected Count	34.9	1.1	36.0
	% within Qualification	94.4%	5.6%	100.0%
	% within Awareness	17.5%	33.3%	18.0%
	% of Total	17.0%	1.0%	18.0%
	Count	137	3	140
	Expected Count	135.8	4.2	140.0
Graduate	% within Qualification	97.9%	2.1%	100.0%
	% within Awareness	70.6%	50.0%	70.0%
	% of Total	68.5%	1.5%	70.0%
	Count	11	0	11
PG and above	Expected Count	10.7	.3	11.0

Total	% within Qualification	100.0 %	0.0%	100.0 %
	% within Awareness	5.7%	0.0%	5.5%
	% of Total	5.5%	0.0%	5.5%
	Count	194	6	200
	Expected Count	194.0	6.0	200.0
	% within Qualification	97.0%	3.0%	100.0 %
	% within Awareness	100.0 %	100.0 %	100.0 %
	% of Total	97.0%	3.0%	100.0 %

92.3% of below intermediate were aware about mobile payment system and 7.7% were unaware. In case of intermediate, 94.4% were aware about mobile payment system and 5.6% were unaware. In case of graduate, 97.9% were aware about mobile payment system and 2.1% were unaware. Of people possessing degree of PG and above, 100% were aware about mobile payment system. According to the result, 97% of the sample was aware about mobile payment system, whereas 3% were unaware.

**Table 4.104: Chi square test for awareness and educational qualification**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2- sided)</b>
Pearson Chi-Square	2.485 <sup>a</sup>	3	.478
Likelihood Ratio	2.404	3	.493
Linear-by-Linear Association	2.426	1	.119
N of Valid Cases	200		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .33.

H<sub>0</sub>16a-There is no association between the awareness about the mobile payment system and educational qualification of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .478 is larger than the alpha value of .05, so we can conclude that our result is *not* significant. This means that there is *no* association between the awareness about the mobile payment system and educational qualification of the merchant.

#### 4.3.8.5 Association between Personal innovativeness and Awareness about Mobile Payment Systems

**Table 4.105: Group statistics of merchants' personal innovativeness**

	N	Mean	Std. Deviation	Std. Error
First to use	32	3.781	.6082	.1075
Wait for others	57	3.439	.6818	.0903
Late users	25	3.440	.7118	.1424
Prefer old	18	3.056	.7254	.1710
Total	132	3.470	.7037	.0613

**Table 4.106: Cross tabulation awareness and personal innovativeness**

#### Personal innovation \* Awareness Crosstabulation

			Awareness		Total
			Yes	No	
When a new technolog	I am usually among the first to use	Count	34	0	34
y is introduce		Expected Count	33.0	1.0	34.0
d in the market		% within Personal innovativeness	100.0%	0.0%	100.0%
		% within Awareness	17.5%	0.0%	17.0%
		% of Total	17.0%	0.0%	17.0%
	I wait for	Count	82	2	84

	others to use first	Expected Count	81.5	2.5	84.0
		% within Personal innovativeness	97.6%	2.4%	100.0%
		% within Awareness	42.3%	33.3%	42.0%
	I am among late users	% of Total	41.0%	1.0%	42.0%
		Count	38	2	40
		Expected Count	38.8	1.2	40.0
		% within Personal innovativeness	95.0%	5.0%	100.0%
		% within Awareness	19.6%	33.3%	20.0%
		% of Total	19.0%	1.0%	20.0%
	I prefer using old technology only	Count	40	2	42
		Expected Count	40.7	1.3	42.0
		% within Personal innovativeness	95.2%	4.8%	100.0%



Total	% within Awareness	20.6%	33.3%	21.0%
	% of Total	20.0%	1.0%	21.0%
	Count	194	6	200
	Expected Count	194.0	6.0	200.0
	% within Personal innovativeness	97.0%	3.0%	100.0%
	% within Awareness	100.0%	100.0%	100.0%
	% of Total	97.0%	3.0%	100.0%

100% of people among the first to use technology were aware about mobile payment system. In case of the one who waits for others to use first, 97.6% were aware about mobile payment system, while 2.4% were unaware. For the late users, 95% were aware, 5% were unaware. Among the ones preferring old technology, 95.2% were about mobile payment system, 4.8% were unaware. According to the result, 97% of the sample was aware about mobile payment system, whereas 3% were unaware.

**Table 4.107: Chi square test for awareness and personal innovativeness**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2- sided)</b>
Pearson Chi-Square	2.160 <sup>a</sup>	3	.540
Likelihood Ratio	3.032	3	.387
Linear-by-Linear Association	1.848	1	.174
N of Valid Cases	200		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.02.

H<sub>0</sub>17a-There is no association between the awareness about the mobile payment system and personal innovativeness of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .540 is *larger* than the alpha value of .05, so we can conclude that our result is *not* significant. This means that there is *no* association between the awareness about the mobile payment system and personal innovativeness of the merchant.

#### 4.3.8.6 Association between Technology inclination and Awareness about Mobile Payment Systems

**Table 4.108: Independent sample test for technology inclination**  
**Independent Samples Test**

	Levene's Test for Equality of Variances		t-test for Equality of Means	
	F	Sig.	t	df
I will continue using mobile payment	.266	.607	2.610	130
Equal variances assumed			2.605	119.825
Equal variances not assumed				

**Table 4.109: Cross tabulation awareness and technology inclination**  
**Technology updated \* Awareness Crosstabulation**

			Awareness		Total
			Yes	No	
Technology updated	Yes	Count	80	1	81
		Expected Count	78.6	2.4	81.0
		% within Technology updated	98.8%	1.2%	100.0%
		% within Awareness	41.2%	16.7%	40.5%
		% of Total	40.0%	0.5%	40.5%

Total	No	Count	114	5	119
		Expected Count	115.4	3.6	119.0
		% within			
		Technology updated	95.8%	4.2%	100.0%
		% within			
		Awareness	58.8%	83.3%	59.5%
		% of Total	57.0%	2.5%	59.5%
		Count	194	6	200
		Expected Count	194.0	6.0	200.0
		% within			
		Technology updated	97.0%	3.0%	100.0%
		% within			
		Awareness	100.0%	100.0%	100.0%
		% of Total	97.0%	3.0%	100.0%

98.8% of the merchants who kept their business updated with new technology were aware about mobile payment system, while 1.2% did not know about mobile payment system. 95.8% of respondents who did not kept business updated with new technology were aware about mobile payment system, while 4.2% were unaware.

**Table 4.110: Chi square test for awareness and technology inclination**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2- sided)	Exact Sig. (1- sided)
Pearson Chi-Square	1.458 <sup>a</sup>	1	.227		
Continuity Correction <sup>b</sup>	.617	1	.432		
Likelihood Ratio	1.637	1	.201		
Fisher's Exact Test				.404	.222
Linear-by-Linear Association	1.451	1	.228		
N of Valid Cases	200				

Sa. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 2.43.

b. Computed only for a 2x2 table

H<sub>0</sub>18a-There is no association between the awareness about the mobile payment system and technology inclination of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .432 is *larger* than the alpha value of .05, so we can conclude that our result is significant. This means that there is *no* association between the awareness about the mobile payment system and personal innovativeness of the merchant.

### 4.3.9 Hypothesis testing for finding association between demographic variables and acceptance of the mobile payment systems by merchant

#### 4.3.9.1 Association between City and Acceptance of Mobile Payment Systems

**Table 4.111: Cross tabulation of use and city**

**City \* Do you accept payment through mobile payment system**  
**Crosstabulation**

		Do you accept payment through mobile payment system			Total
		Yes	No	Abandoned	
City Ranchi	Count	58	31	11	100
	Expected Count	66.0	22.0	12.0	100.0
	% within City	58.0%	31.0%	11.0%	100.0%
	% within Do you accept payment through mobile payment system	43.9%	70.5%	45.8%	50.0%
	% of Total	29.0%	15.5%	5.5%	50.0%
Kolkata	Count	74	13	13	100
	Expected Count	66.0	22.0	12.0	100.0
	% within City	74.0%	13.0%	13.0%	100.0%
	% within Do you accept payment through mobile payment system	56.1%	29.5%	54.2%	50.0%
	% of Total	37.0%	6.5%	6.5%	50.0%
Total	Count	132	44	24	200
	Expected Count	132.0	44.0	24.0	200.0
	% within City	66.0%	22.0%	12.0%	100.0%

% within Do you accept payment through mobile payment system	100.0%	100.0%	100.0%	100.0%
% of Total	66.0%	22.0%	12.0%	100.0%

58% of Ranchi respondents were accepting mobile payment system, while 31% did not accept mobile payment and 11% abandoned accepting such payments. In case of Kolkata city, 74% of the respondents were accepting mobile payments, while 13% of the respondents were not accepting it and 13% have abandoned using it.

**Table 4.112: Chi square test for use and city**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2- sided)</b>
Pearson Chi-Square	9.470 <sup>a</sup>	2	.009
Likelihood Ratio	9.695	2	.008
Linear-by-Linear Association	1.997	1	.158
N of Valid Cases	200		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.00.

H<sub>0</sub>13b-There is no association between the use of mobile payment system and city of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .009 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and city of the merchant.

#### 4.3.9.2 Association between Gender and Acceptance of Mobile Payment Systems

**Table 4.113: Cross tabulation of use and gender**

**Gender \* Do you accept payment through mobile payment system**

**Crosstabulation**

			Do you accept payment through mobile payment system			Total
			Yes	No	Abandoned	
Gender	Male	Count	116	34	19	169
		Expected Count	111.5	37.2	20.3	169.0
		% within Gender	68.6%	20.1%	11.2%	100.0%
		% within Do you accept payment through	87.9%	77.3%	79.2%	84.5%



		mobile payment system				
		% of Total	58.0%	17.0%	9.5%	84.5%
	Femal	Count	16	10	5	31
	e	Expecte d Count	20.5	6.8	3.7	31.0
		% within Gender	51.6%	32.3%	16.1%	100.0 %
		% within Do you accept payment through mobile payment system				
		% of Total	8.0%	5.0%	2.5%	15.5%
	Total	Count	132	44	24	200
		Expecte d Count	132.0	44.0	24.0	200.0
		% within	66.0%	22.0%	12.0%	100.0 %

Gender				
% within				
Do you accept payment through mobile payment system	100.0 %	100.0 %	100.0%	100.0 %
% of Total	66.0%	22.0%	12.0%	100.0 %

68.6% of the male respondents were accepting payment mobile, while 20.1% were not accepting and 11.2% have abandoned using it. For females, 51.6% were accepting mobile payment, 32.3% were not accepting payment through mobile and 16.1% have abandoned using it. According to the result, 66% of the sample was accepting mobile payment system, whereas 22% were not accepting it and 12% have abandoned using it .

**Table 4.114: Chi square test for use and gender**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.427 <sup>a</sup>	2	.180
Likelihood Ratio	3.282	2	.194

Linear-by-Linear Association	2.562	1	.109
N of Valid Cases	200		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.72.

H<sub>0</sub>14b-There is no association between the use of mobile payment system and gender of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .180 is *larger* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and gender of the merchant.

#### 4.3.9.3 Association between Age and Acceptance of Mobile Payment Systems

**Table 4.115: Cross tabulation of use and age**

**Age \* Do you accept payment through mobile payment system**

**Crosstabulation**

			Do you accept payment through mobile payment system			Total
			Yes	No	Abandoned	
Age	15 to	Count	11	3	4	18
	25 yrs					
		Expected Count	11.9	4.0	2.2	18.0

26 to 40 yrs	% within Age	61.1%	16.7%	22.2%	100.0%
	% within Do you accept payment through mobile payment system	8.3%	6.8%	16.7%	9.0%
	% of Total	5.5%	1.5%	2.0%	9.0%
	Count	65	18	7	90
	Expected Count	59.4	19.8	10.8	90.0
	% within Age	72.2%	20.0%	7.8%	100.0%
	% within Do you accept payment through mobile payment system	49.2%	40.9%	29.2%	45.0%
	% of Total	32.5%	9.0%	3.5%	45.0%

41 to 60 yrs	Count	50	16	11	77
	Expected Count	50.8	16.9	9.2	77.0
	% within Age	64.9%	20.8%	14.3%	100.0%
	% within Do you accept payment through mobile payment system	37.9%	36.4%	45.8%	38.5%
	% of Total	25.0%	8.0%	5.5%	38.5%
Above 61 yrs	Count	6	7	2	15
	Expected Count	9.9	3.3	1.8	15.0
	% within Age	40.0%	46.7%	13.3%	100.0%
	% within Do you accept payment through mobile payment	4.5%	15.9%	8.3%	7.5%

Total	system				
	% of Total	3.0%	3.5%	1.0%	7.5%
	Count	132	44	24	200
	Expected Count	132.0	44.0	24.0	200.0
	% within Age	66.0%	22.0%	12.0%	100.0%
	% within Do you accept payment through mobile payment system	100.0%	100.0%	100.0%	100.0%
	% of Total	66.0%	22.0%	12.0%	100.0%

In case of age group of 15 to 25yrs about 61.1% were accepting mobile payment system, while 16.7% were not accepting mobile payment and 22.2% have abandoned accepting it. In case of age group of 26 to 40 yrs 72.2% were accepting mobile payment system, 20% were not accepting and 7.8% have abandoned accepting it. In case of age group of 41 to 60 yrs, 64.9% were accepting payment through mobile payment system, 20.8% were not accepting

payments through it and 14.3% have abandoned accepting payments through it. In case of age group of above 61 yrs about 40% were accepting mobile payment system, 46.7% were not accepting it and 13.3% have abandoned accepting it. According to the result, 66% of the sample was accepting mobile payment, 22% were not accepting it, whereas 12% have abandoned accepting it.

**Table 4.116: Chi square test for use and age**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2- sided)</b>
Pearson Chi-Square	10.002 <sup>a</sup>	6	.125
Likelihood Ratio	9.103	6	.168
Linear-by-Linear Association	1.147	1	.284
N of Valid Cases	200		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 1.80.

H<sub>0</sub>15b-There is no association between the use of mobile payment system and age of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .125 is *larger* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and age of the merchant.

#### 4.3.9.4 Association between Educational qualification and Acceptance of Mobile Payment Systems

**Table 4.117: Cross tabulation use and education qualification**

**Qualification \* Do you accept payment through mobile payment system Crosstabulation**

		Do you accept payment through mobile payment system			Total
		Yes	No	Abandoned	
Qualification	Count	4	6	3	13
	Expected Count	8.6	2.9	1.6	13.0
	% within Qualification	30.8%	46.2%	23.1%	100.0%
	% within Do you accept payment through mobile payment system	3.0%	13.6%	12.5%	6.5%



	% of Total	2.0%	3.0%	1.5%	6.5%
	Count	19	11	6	36
	Expected Count	23.8	7.9	4.3	36.0
	% within Qualification	52.8%	30.6%	16.7%	100.0%
Intermediate	% within Do you accept payment through mobile payment system	14.4%	25.0%	25.0%	18.0%
Graduate	% of Total	9.5%	5.5%	3.0%	18.0%
	Count	101	26	13	140
	Expected Count	92.4	30.8	16.8	140.0
	% within Qualification	72.1%	18.6%	9.3%	100.0%

PG and above	% within Do you accept payment through mobile payment system	76.5%	59.1%	54.2%	70.0%
	% of Total	50.5%	13.0%	6.5%	70.0%
	Count	8	1	2	11
	Expected Count	7.3	2.4	1.3	11.0
	% within Qualification	72.7%	9.1%	18.2%	100.0%
	% within Do you accept payment through mobile payment system	6.1%	2.3%	8.3%	5.5%
	% of	4.0%	0.5%	1.0%	5.5%

Total	Total				
	Count	132	44	24	200
	Expected Count	132.0	44.0	24.0	200.0
	% within Qualification	66.0%	22.0%	12.0%	100.0%
	% within Do you accept payment through mobile payment system	100.0%	100.0%	100.0%	100.0%
	% of Total	66.0%	22.0%	12.0%	100.0%

30.8% of the respondents having degree below intermediate were accepting mobile payment, 46.2% were not accepting mobile payment and 23.1% have abandoned using it. In case of intermediate, 52.8% were accepting mobile payment system, while 30.6% were not accepting it and 16.7% have abandoned accepting it. In case of graduate, 72.1% were accepting mobile payment system, 18.6% were not accepting it and 9.3% have abandoned accepting it. Of people possessing degree of PG and above, 72.7% were accepting mobile payment, 9.1% were not accepting it and 18.2% have abandoned accepting it. According to the result, 66% of the sample was

accepting mobile payment, 22% were not accepting it, whereas 12% have abandoned accepting it.

**Table 4.118: Chi square test for use and educational qualification**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	13.693 <sup>a</sup>	6	.033
Likelihood Ratio	13.331	6	.038
Linear-by-Linear Association	8.143	1	.004
N of Valid Cases	200		

a. 5 cells (41.7%) have expected count less than 5. The minimum expected count is 1.32.

H<sub>0</sub>16b-There is no association between the use of mobile payment system and educational qualification of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .033 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is *no* association between the awareness about the mobile payment system and educational qualification of the merchant.

#### 4.3.9.5 Association between Personal innovativeness and Acceptance of Mobile Payment Systems

**Table 4.119: Cross tabulation use and personal innovativeness**

**Personal innovativeness \* Do you accept payment through mobile payment system Crosstabulation**

			Do you accept payment through mobile payment system			Total
			Yes	No	Abandoned	
When a new technology is introduced in the market	I am usually among the first to use	Count	32	1	1	34
		Expected Count	22.4	7.5	4.1	34.0
		% within Technology Adoption Phase	94.1%	2.9%	2.9%	100.0%
		% within Do you accept payment through mobile payment system	24.2%	2.3%	4.2%	17.0%
		% of	16.0%	0.5%	0.5%	17.0%

I wait for others to use first	Total				
	Count	57	19	8	84
	Expected Count	55.4	18.5	10.1	84.0
	% within Personal innovativeness	67.9%	22.6%	9.5%	100.0%
	% within Do you accept payment through mobile payment system	43.2%	43.2%	33.3%	42.0%
	% of Total	28.5%	9.5%	4.0%	42.0%
	Count	25	11	4	40
	Expected Count	26.4	8.8	4.8	40.0
	% within Personal innovativeness	62.5%	27.5%	10.0%	100.0%
I am among late users	Count	25	11	4	40
	Expected Count	26.4	8.8	4.8	40.0
	% within Personal innovativeness	62.5%	27.5%	10.0%	100.0%

I prefer using old technology only	% within				
	Do you accept payment through mobile payment system	18.9%	25.0 %	16.7%	20.0%
	% of Total	12.5%	5.5%	2.0%	20.0%
	Count	18	13	11	42
	Expected Count	27.7	9.2	5.0	42.0
	% within Personal innovativeness	42.9%	31.0 %	26.2%	100.0 %
	% within				
	Do you accept payment through mobile payment system	13.6%	29.5 %	45.8%	21.0%
	% of Total	9.0%	6.5%	5.5%	21.0%

Total	Count	132	44	24	200
	Expected Count	132.0	44.0	24.0	200.0
	% within Personal innovativeness	66.0%	22.0%	12.0%	100.0%
	% within Do you accept payment through mobile payment system	100.0%	100.0%	100.0%	100.0%
	% of Total	66.0%	22.0%	12.0%	100.0%

94.1% of people among the first to use technology were accepting mobile payment, while 2.9% were not accepting it, and 2.9% have abandoned accepting mobile payment. In case of the one who waits for others to use first, 67.9% were accepting mobile payment, while 22.6% were not accepting it and 9.5% have abandoned accepting it. For the late users, 62.5% were accepting it, 27.5% were not accepting and 10% have abandoned using it. Among the ones preferring old technology, 42.9% were accepting mobile payment, 31% were not accepting it and 26.2% have abandoned accepting mobile payment. According to the result, 66% of the sample was accepting mobile payment, 22% were not accepting it, whereas 12% have abandoned accepting it.



**Table 4.120: Chi square test for use and personal innovativeness**

**Chi-Square Tests**

	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2-sided)</b>
Pearson Chi-Square	25.243 <sup>a</sup>	6	.000
Likelihood Ratio	27.626	6	.000
Linear-by-Linear Association	20.111	1	.000
N of Valid Cases	200		

a. 2 cells (16.7%) have expected count less than 5. The minimum expected count is 4.08.

H<sub>0</sub>17b-There is no association between the use of mobile payment system and personal innovativeness of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .000 is *smaller* than the alpha value of .05, so we can conclude that our result is significant. This means that there is association between the awareness about the mobile payment system and personal innovativeness of the merchant.

#### 4.3.9.6 Association between Technology inclination and Acceptance of Mobile Payment Systems

**Table 4.121: Cross tabulation use and technology inclination**

**Technology updated \* Do you accept payment through mobile payment system Crosstabulation**

			Do you accept payment through mobile payment system			Total
			Yes	No	Abandoned	
Technology updated	Yes	Count	57	18	6	81
		Expected Count	53.5	17.8	9.7	81.0
		% within Technology updated	70.4%	22.2%	7.4%	100.0%
		% within Do you accept payment through mobile payment system	43.2%	40.9%	25.0%	40.5%
		% of Total	28.5%	9.0%	3.0%	40.5%
	No	Count	75	26	18	119
		Expected	78.5	26.2	14.3	119.0

Total	Count				
	% within Technology updated	63.0%	21.8%	15.1%	100.0%
	% within Do you accept payment through mobile payment system	56.8%	59.1%	75.0%	59.5%
	% of Total	37.5%	13.0%	9.0%	59.5%
	Count	132	44	24	200
	Expected Count	132.0	44.0	24.0	200.0
	% within Technology updated	66.0%	22.0%	12.0%	100.0%
	% within Do you accept payment through mobile payment system	100.0%	100.0%	100.0%	100.0%

% of Total	66.0%	22.0%	12.0%	100.0%
------------	-------	-------	-------	--------

70.4% of the merchants who kept their business updated with new technology were accepting mobile payment, 22.2% were not accepting mobile payment and 7.4% abandoned accepting mobile payment. 63% of respondents who did not kept business updated with new technology were accepting mobile payment, while 21.8% were not accepting mobile payment and 15.1% have abandoned accepting mobile payment.

**Table 4.122: Chi square test for use and technology inclination**

**Chi-Square Tests**

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.790 <sup>a</sup>	2	.248
Likelihood Ratio	2.940	2	.230
Linear-by-Linear Association	2.228	1	.136
N of Valid Cases	200		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.72.

H<sub>0</sub>18b-There is no association between the use of mobile payment system and technology inclination of the merchant.

To be significant the Sig. value needs to be .05 or smaller. In this case the value of .248 is *larger* than the alpha value of .05, so we can conclude that our

result is significant. This means that there is association between the awareness about the mobile payment system and technology inclination of the merchant.

#### **4.3.9.7 Association between Awareness and Acceptance of Mobile Payment Systems**

**Table 4.123: Cross tabulation awareness and acceptance**

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	14.771 <sup>a</sup>	2	.001
Likelihood Ratio	14.427	2	.001
Linear-by-Linear Association	6.293	1	.012
N of Valid Cases	200		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is .72.

Since the p- value .001 is less than the significance value .05, we can conclude that there is association between the awareness about the mobile payment system and use of mobile payments system among merchants.

#### **4.3.10 Hypotheses testing for finding the impact of the demographic factors on the continued use of the mobile payment systems**

##### **4.3.10.1 Impact of City on Continued use of Mobile payment systems**

Independent t-test was done to find out the impact of city on continued use of mobile payment. City was taken as the categorical independent variable and continued use of mobile payment system as the dependent variable. For this purpose, respondents were divided into two groups a) Ranchi & b) Kolkata.

**Table 4.124: Group statistics for merchants' city**

Group Statistics					
City	N	Mean	Std. Deviation	Std. Error Mean	
I will continue using mobile payment Ranchi	58	3.707	.6491	.0852	
Kolkata	74	3.284	.6928	.0805	

**Table 4.125 : T test for merchants' continued use with city**

Independent Samples Test					
	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
I will continue using mobile payment	1.696	.195	3.580	130	.000
Equal variance assumed					
Equal variance not assumed			3.608	125.874	.000

H<sub>0</sub>13c-There is no significant difference in the continued use of mobile payment system and city of the merchant.

There was significant difference in scores for males ( $M=3.71$ ,  $SD=.65$ ) and females ( $M=3.28$ ,  $SD=.69$ );  $t(130)=1.7$ ,  $p=.000$ .

Since  $p = 0.00$  is less than  $\alpha = 0.05$ , the null hypothesis is rejected. That means there is significant difference in the continued use of mobile payment system and city of the merchant.

#### 4.3.10.2 Impact of Gender on Continued use of Mobile payment systems

Independent t-test was done to find out the impact of gender on continued use of mobile payment. Gender was taken as the categorical independent variable, for this respondents were divided into two groups a) Male & b) Female, and continued use of mobile payment was taken the continuous dependent variable.

**Table 4.126: Group statistics for merchants' gender**

Group Statistics					
Gender		N	Mean	Std. Deviation	Std. Error Mean
I will continue using mobile payment	Male	116	3.448	.7021	.0652
	Female	16	3.625	.7188	.1797

**Table 4.127 : T test for merchants' continued use with gender**

Independent Samples Test						
		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
I will continue using mobile payment	Equal variances assumed	.125	.724	-.941	130	.348

Equal variances not assumed				-.924	19.165	.367
--------------------------------------	--	--	--	-------	--------	------

H<sub>0</sub>14c-There is no significant difference in the continued use of mobile payment system and gender of the merchant.

There was significant difference in scores for Ranchi (M=3.44, SD=.702) and Kolkata (M=3.63, SD=.72);  $t(130) = .125$   $p = .348$ .

Since  $p = 0.348$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means there is no significant difference in the continued use of mobile payment system and gender of the merchant.

#### 4.3.10.3 Impact of Age on Continued use of Mobile payment systems

One way ANOVA test was done to explore the impact of age group on use of mobile payment. Age was taken as the categorical independent variable, for this respondents were divided into four groups a) 15 to 25yrs, b) 26 to 40yrs, c) 41 to 60yrs and d) 61 and above yrs, and continued use of mobile payment was taken the continuous dependent variable.

**Table 4.128: Group statistics for merchants' age**

	N	Mean	Std. Deviation
15 to 25yrs	11	3.455	.9342
26 to 40yrs	65	3.523	.6871
41 to 60yrs	50	3.440	.6749
61 and above yrs	6	3.167	.7528
Total	132	3.470	.7037



**Table 4.129: Test of Homogeneity of Variances age**

**I will continue using mobile payment**

Levene Statistic	df1	df2	Sig.
1.011	3	128	.390

Since the significance value is .390, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.130: One way ANOVA test for use and age**

**ANOVA**

**I will continue using mobile payment**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.783	3	.261	.521	.669
Within Groups	64.096	128	.501		
Total	64.879	131			

H<sub>0</sub>15c-There is no significant difference in the continued use of mobile payment system and age of the merchant.

There was no statistically significant difference at the  $p < .05$  level in the scores for all 4 age groups [ $F(3, 128) = .52, p = .67$ ].

Since  $p = 0.669$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means age group of the respondents has no significance impact on the continued use of mobile payment system.

#### **4.3.10.4 Impact of Educational qualification on continued use of mobile payment systems**

One way ANOVA test was done to explore the impact of educational qualification on use of mobile payment. Educational qualification was taken as the categorical independent variable, for this respondents were divided into four groups a) below inter, b) intermediate, c) graduate and d) post graduate or higher, and use of mobile payment was taken the continuous dependent variable.

**Table 4.131: Group statistics for merchants' educational qualification**

	N	Mean	Std. Deviation	Std. Error
Below intermediate	4	2.750	.5000	.2500
Intermediate	19	3.263	.7335	.1683
Graduate	101	3.515	.6872	.0684
Post graduate or higher	8	3.750	.7071	.2500
Total	132	3.470	.7037	.0613

**Table 4.132: Test of Homogeneity of Variances**

**I will continue using mobile payment**

Levene Statistic	df1	df2	Sig.
.707	3	128	.549

Since the significance value is .549, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.133: One way ANOVA test for use and educational qualification**

**ANOVA**

**I will continue using mobile payment**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.717	3	1.239	2.593	.056
Within Groups	61.162	128	.478		
Total	64.879	131			

H<sub>0</sub>16c-There is no significant difference in the continued use of mobile payment system and educational qualification of the merchant.

There was no statistically significant difference at the  $p < .05$  level in the scores for all 4 age groups [ $F(3, 128) = 2.59, p = .06$ ].

Since  $p = 0.056$  is more than  $\alpha = 0.05$ , the null hypothesis is accepted. That means continued use of mobile payment is not influenced by educational qualification of the merchant.

#### **4.3.10.5 Impact of Personal innovativeness on continued use of Mobile payment systems**

One way ANOVA test was done to explore the impact of personal innovativeness on use of mobile payment. Personal innovativeness was taken as the categorical independent variable, for this respondents were divided into four groups a) first to use, b) wait others to use, c) among late users and d) prefer to

use older technology, use of mobile payment was taken the continuous dependent variable.

**Table 4.134: Group statistics for merchants' personal innovativeness**

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error</b>
First to use	32	3.781	.6082	.1075
Wait others to use	57	3.439	.6818	.0903
Among late users	25	3.440	.7118	.1424
Prefer to use older technology	18	3.056	.7254	.1710
Total	132	3.470	.7037	.0613

**Table 4.135: Test of Homogeneity of Variances**

**I will continue using mobile payment**

<b>Levene Statistic</b>	<b>df1</b>	<b>df2</b>	<b>Sig.</b>
1.631	3	128	.185

Since the significance value is .185, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.136: One way ANOVA test for use and personal innovativeness**

**ANOVA**

**I will continue using mobile payment**

	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between	6.271	3	2.090	4.565	.005

Groups					
Within Groups	58.608	128	.458		
Total	64.879	131			

H<sub>0</sub>17c-There is no significant difference in the continued use of mobile payment system and personal innovativeness of the merchant.

There was no statistically significant difference at the  $p < .05$  level in the scores for all 4 age groups [ $F(3, 128=4.57, p=.005)$ ].

Since  $p = 0.005$  is less than  $\alpha = 0.05$ , the null hypothesis is rejected. That means continued use of mobile payment is influenced by personal innovativeness of the merchant.

#### **4.3.10.6 Impact of Technology inclination on Continued use of Mobile payment systems**

One way ANOVA test was done to explore the impact of technology inclination on use of mobile payment. Technology inclination was taken as the categorical independent variable, for this respondents were divided into two groups a) people who kept their business updated with new technology, and b) people who preferred old technology only, use of mobile payment was taken the continuous dependent variable.

**Table 4.137: Group statistics for merchants' technology inclination**

	N	Mean	Std. Deviation	Std. Error
Yes	57	3.649	.6941	.0919
No	75	3.333	.6844	.0790
Total	132	3.470	.7037	.0613

**Table 4.138: Test of Homogeneity of Variances**

**I will continue using mobile payment**

<b>Levene Statistic</b>	<b>df1</b>	<b>df2</b>	<b>Sig.</b>
.266	1	130	.607

Since the significance value is .607, which is greater than .05, there is no violation of homogeneity test of variance assumption.

**Table 4.139: One way ANOVA test for use and technology inclination**

**ANOVA**

**I will continue using mobile payment**

	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between Groups	3.230	1	3.230	6.810	.010
Within Groups	61.649	130	.474		
Total	64.879	131			

H<sub>0</sub>18c-There is no significant difference in the continued use of mobile payment system and technology inclination of the merchant.

There was no statistically significant difference at the  $p < .05$  level in the scores for all 4 age groups [ $F(3, 130) = 6.81, p = .01$ ].

Since  $p = 0.010$  is less than  $\alpha = 0.05$ , the null hypothesis is accepted. That means continued use of mobile payment is not influenced by technology inclination of the merchant.

#### 4.3.10.7 Hypothesis testing for finding the impact of other factors on the continued use of the mobile payment systems

H<sub>0</sub>19-Usability will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>0</sub>20-Consumer influence will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>0</sub>21-Government initiatives will not significantly influence the continued use of mobile payment system by the merchant.

H<sub>0</sub>22-Application provider will not significantly influence the continued use of mobile payment system by the merchant.

**Table 4.140: Correlation of all independent and dependent variables**

		Correlations				
		I will continue using mobile payment	U	CUST	APP	GOVT
Pearson Correlation	I will continue using mobile payment	1.000	.628	.568	.616	.597
	U	.628	1.000	.380	.429	.732
	CUST	.568	.380	1.000	.449	.304
	APP	.616	.429	.449	1.000	.325
	GOVT	.597	.732	.304	.325	1.000
Sig. (1-tailed)	I will continue using mobile payment	.	.000	.000	.000	.000
	U	.000	.	.000	.000	.000
	CUST	.000	.000	.	.000	.000

	APP	.000	.000	.000	.	.000
	GOVT	.000	.000	.000	.000	.
N	I will continue using mobile payment	132	132	132	132	132
	U	132	132	132	132	132
	CUST	132	132	132	132	132
	APP	132	132	132	132	132
	GOVT	132	132	132	132	132

**Table 4.141: Model summary**

Model Summary <sup>b</sup>				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.796 <sup>a</sup>	.633	.622	.4328

a. Predictors: (Constant), GOVT, CUST, APP, U

b. Dependent Variable: I will continue using mobile payment

Model summary shows R-value as 0.796, which means there is good correlation between dependent and independent variable. R-square=0.633, which means that 63.3% of the total variance in the continued use of mobile payment can be explained by all the independent variables. That means, continued use of mobile payment is strongly predicted by all the four independent variables.

**Table 4.142: ANOVA test**

ANOVA <sup>a</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.093	4	10.273	54.852	.000 <sup>b</sup>
	Residual	23.786	127	.187		
	Total	64.879	131			



a. Dependent Variable: I will continue using mobile payment

b. Predictors: (Constant), GOVT, CUST, APP, U

ANOVA table shows the p-value as 0.00, therefore the result is significant as the p-value is less than significant value 0.05. Also F-ratio value is 54.9, which is considered as good.

**Table 4.143: Regression coefficients**

**Coefficients<sup>a</sup>**

	<b>Unstandardized Coefficients</b>		<b>Standardized Coefficients</b>		
<b>Model</b>	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>	<b>t</b>	<b>Sig.</b>
(Constant)	-1.155	.374		-3.087	.002
U	.154	.069	.186	2.231	.027
CUST	.420	.097	.267	4.311	.000
APP	.439	.085	.327	5.174	.000
GOVT	.233	.067	.274	3.471	.001

All the null hypothesis is rejected as the significance value is less than 0.05 for all independent variable. This shows that all the independent variables (usability, customer influence, application provider and government initiatives) have a significant positive relationship with the continued use of mobile payment.

#### **4.4 Summary**

In this chapter analysis of data was done for both consumers and merchants using MS Excel for tables and graphs, whereas one way ANOVA, regression ANOVA, T-test and Chi- square tests were done using IBM SPSS ver. 23. The hypotheses thus accepted or rejected have been documented in the next chapter.

# **CHAPTER 5: RESULT, DISCUSSIONS & CONCLUSIONS**

# **CHAPTER 5: RESULT, DISCUSSIONS & CONCLUSIONS**

## **5.1 Overview**

This chapter concludes the major findings of the research. This study analyzed demographic factors influencing the awareness and use of mobile payments among consumers and merchants of Ranchi and Kolkata cities. Also the impact of independent variables on the continued use of mobile payments was studied. The result of comparison between the merchants and consumers of mobile payment has been documented. This chapter also provided practical implications for mobile payment stakeholders and came up with suggestions too. The chapter concluded with the limitations of the research methodology, geographical location, time framework and thus finally recommended the scope for the future researcher.

## **5.2 Results & Discussions**

This study covered both Merchants and Consumers of Ranchi and Kolkata city. This study aimed at understanding the actual level of awareness and usage of mobile payment system with the problems faced while using for both consumers and merchants and comparing it in two different cities. The study also tried to find the impact of independent factors and demographic factors on the use of mobile payment systems. The study was done to meet four objectives of the research and the summary is presented below for all the objectives.

### **5.2.1 Results of objective one**

Objective one-To study the awareness, adoption and usage of consumer and merchants about mobile payment system and compare the awareness and usage level of mobile payment systems in Ranchi and Kolkata.

Statistical tools used- Frequency and mean

Consumer analysis results – There is a high level of awareness among the consumers of the both the cities as almost 90 percent of the sample population is aware about the mobile payment system and more than 60 percent of people are actually using it in both the cities but the usage level is high in Kolkata in comparison to Ranchi by 8 percent.

Cash is the most preferred payment option for both Ranchi and Kolkata. Mobile payment is preferred to net banking and credit cards in Ranchi while the case is opposite in Kolkata where mobile payment is the last preferred payment method.

Mobile payment seems to be recent trend in Ranchi as almost 65% of users are using mobile payment from last 2 years. Whereas, opposite case is seen in Kolkata where more than 55% of the users have been using mobile payment for more than 2 years. In case of expenditure, only 50% of the users in Ranchi used mobile payment for payments of more than Rs 2000, whereas 67% of the users in Kolkata pay through mobile payment for such transactions.

PayTm was used by almost all the respondents of both the cities. Freecharge, PhonePe, BHIM, Jio Money, G-Pay were the other used payment apps but these were used by very fewer respondents in both the cities.

Merchants Analysis- It revealed that almost every merchant was aware about mobile payment system in Kolkata with 99% of awareness level whereas, 95% of merchants were aware about the mobile payment system in Ranchi. The number of merchants accepting mobile payments is much higher in Kolkata as compared to Ranchi. 74% of merchants are accepting payments through mobile in Kolkata whereas only 58% of merchants are accepting such payments in Ranchi. In both the cities significant percentage of merchants have used and abandoned mobile payment as 11% of Ranchi merchants have abandoned the use of mobile payments and 13% of Kolkata merchants have done so.

Mobile payment is the third preferred payment options among merchants of both the cities. Cash was found to be the most preferred option for accepting payments in both the cities followed by card payments, whereas net banking is least preferred by merchants. Findings indicate that traditional payment methods are still popular among merchants. PayTm is accepted by almost every merchant in both the cities with 97% of merchants accepting payTm in both the cities. Further research done on PayTM (Vikas & Kumar, 2018) has found Paytm app more secure than cash and encourages cashless economy in India. Also after talking to merchants it was found that PayTM is preferred because of good image building through advertisement.

NFC is accepted in Kolkata by significant numbers of merchants but it is not accepted by Ranchi merchants. Mobikwik is also accepted by good numbers of merchants in Kolkata but insignificant number of merchants accepts it in Ranchi. All other mobile payment systems have quite low acceptance among merchants in both cities.

Mobile payment is used mainly for sales transaction by all the merchants in both cities. Majority of merchants find it safe to use mobile payment system. 72% of Ranchi merchants and 86% of Kolkata merchants feel so. Ranchi

merchants somewhat encourage their consumers to pay through their mobile as 38% encourages their customers, while, hardly there is such encouragement by Kolkata merchant as only 4% of merchants actually encourages their customer to make mobile payments.

### 5.2.2 Results of objective two

Objective two: To find the influence of demographic factors on the awareness and use of mobile payment system

Statistical Tools used- Chi-square was used to find the association between the demographic variables and awareness about the mobile payment system and demographic variables and use of mobile payment system among the consumers and merchant group. Secondly, t-test and one –way Anova was used to find the impact of demographic variables on continued use of mobile payment system.

Results- Table below depicts the summary of the findings from chi-square.

#### 5.2.2.1 Chi- square for Consumers

**Table 5.1: Chi square table for consumer awareness and consumer use**

Variable	Awareness		Use	
	p-value	Null hypothesis Accept/Reject	p-value	Null hypothesis Accept/Reject
City	.723	Accept	.133	Accept
Gender	.315	Accept	.200	Accept

Age	.000	Reject	.000	Reject
Qualification	.155	Accept	.232	Accept
Occupation	.005	Reject	.000	Reject
Income	.050	Reject	.000	Reject
Personal Innovativeness	.000	Reject	.000	Reject

Results from the above table 5.1, with regard to awareness about Mobile Payment Systems, show demographic factors city, gender and qualification had p-value 0.723, 0.315 and 0.155 respectively. Since the p-value is more than the significance value 0.05, we accept the null hypothesis. This means that demographic variables city, gender and qualification have no significant relationship with the awareness about mobile payment system for consumers. While, demographics age, occupation, income and personal innovativeness had p-value 0.000, 0.005, 0.050 and 0.000 respectively. Since the p-value is less than the significance value 0.05, we reject the null hypothesis. This means that demographic variables, occupation, income and personal innovativeness have a significant relationship with the awareness about mobile payment system for consumers.

Similarly, for use of mobile payment systems, demographic factors city, gender and qualification had p-value 0.133, 0.200 and 0.232 respectively. Since the p-value is more than the significance value 0.05, we accept the null hypothesis and reject the alternate hypothesis. This means there is no relationship between the use of mobile payment system and demographic variables city, gender and qualification for consumers. While, demographics age, occupation, income and personal innovativeness had p-value 0.000,



0.000, 0.000 and 0.000 respectively. Since the p-value is less than the significance value 0.05, we reject the null hypothesis and accept the alternate hypothesis. This means there is relationship between the demographic variables age, occupation, income and personal innovativeness, and use of mobile payment system for consumers.

#### 5.2.2.2 Chi-square for merchants

**Table 5.2: Chi square table for merchant awareness and merchant use**

Variable	Awareness		Use	
	p-value	Null hypothesis Accept/Reject	p-value	Null hypothesis Accept/Reject
City	.214	Accept	.009	Reject
Gender	.514	Accept	.180	Accept
Age	.070	Accept	.125	Accept
Qualification	.478	Accept	.033	Reject
Personal Innovativeness	.540	Accept	.000	Reject
Technology inclination	.432	Accept	.248	Accept

Results from the above table 5.2, shows demographic factors city, gender, age, qualification, personal innovativeness and technology inclination had p-value 0.214, 0.514, 0.070, 0.478, 0.540, and 0.432 respectively. Since the p-value is more than the significance value 0.05, we accept the null hypothesis and reject the alternate hypothesis. This means that there is no relationship between the awareness of mobile payment system and demographic variables for merchants.

Similarly, demographic factors gender, age, and technology inclination had p-value 0.180, 0.125 and 0.248 respectively. Since the p-value is more than the significance value 0.05, we accept the null hypothesis. This means there is no relationship between the use of mobile payment system and demographic variables gender, age, and technology inclination for merchants. While, demographics factors city, qualification and personal innovativeness had p-value 0.009, 0.033, and 0.000 respectively. Since the p-value is less than the significance value 0.05, we reject the null hypothesis. This means there is a relationship between the demographic variables city, qualification and personal innovativeness, and use of mobile payment systems for merchants.

### 5.2.2.3 Results from independent sample T-test and ANOVA for consumers

**Table 5.3: Demographic factors affecting continued use of mobile payment by consumers**

Variables	Null hypothesis	P value	Accept/Reject
City	H <sub>01c</sub> -There is no significant difference in the continued use of mobile payment and city	0.023	Reject null hypothesis

Gender	H <sub>0</sub> 2c-There is no significant difference in the continued use of mobile payment and gender	0.020	Reject null hypothesis
Age	H <sub>0</sub> 3c-There is no significant difference in the continued use of mobile payment and age of the consumer	0.404	Accept Null hypothesis
Educational qualification	H <sub>0</sub> 4c-There is no significant difference in the continued use of mobile payment and educational qualification of the consumer	0.596	Accept Null hypothesis
Occupation	H <sub>0</sub> 5c- There is no significant difference in the continued use of mobile payment and occupation of the consumer	0.469	Accept Null hypothesis
Income	H <sub>0</sub> 6c- There is no significant difference in the continued use of mobile payment and income of the consumer	0.177	Accept Null hypothesis
Personal innovativeness	H <sub>0</sub> 7c- There is no significant difference in the continued use of mobile payment and personal innovativeness of the consumer	0.488	Accept Null hypothesis

Results from above table shows, demographic factors age, qualification, occupation, income and personal innovativeness had p-value 0.404, 0.596, 0.469, 0.177 and 0.488 respectively. Since the p-value is more than the significance value 0.05, we reject the alternate hypothesis. This means that age, qualification, occupation, income and personal innovativeness do not impact continued use of mobile payment system for consumer. While, demographics factors city and gender had p-value 0.023, and 0.020 respectively. Since the p-value is less than the significance value 0.05, we

reject the null hypothesis. This means that city and gender significantly impact the continued use of mobile payments for consumer.

#### 5.2.2.4 Results from independent sample T-test and ANOVA for merchants

**Table 5.4: Demographic factors affecting continued use of mobile payment by merchants**

Variables	Hypothesis	p value	Accept/Reject
City	H <sub>013c</sub> -There is no significant difference in the continued use of mobile payment and city	0.000	Reject null hypothesis
Gender	H <sub>014c</sub> -There is no significant difference in the continued use of mobile payment and gender	.348	Accept null hypothesis
Age	H <sub>015c</sub> -There is no significant difference in the continued use of mobile payment and age	.669	Accept Null hypothesis
Educational Qualification	H <sub>016c</sub> -There is no significant difference in the continued use of mobile payment and educational qualification	0.056	Accept Null hypothesis
Personal innovativeness	H <sub>017c</sub> -There is no significant difference in the continued use of mobile payment and personal innovativeness	0.005	Reject Null hypothesis
Technology Inclination	H <sub>018c</sub> -There is no significant difference in the continued use of mobile payment and technology inclination	0.010	Reject Null hypothesis

Results from the above table, demographic factors gender, age and qualification had p-value 0.348, 0.669 and 0.060 respectively. Since the p-value is more than the significance value 0.05, we accept the null hypothesis. This means that gender, age and qualification do not impact continued use of mobile payment system for merchants. While, demographics factors city, personal innovativeness and technology inclination had p-value 0.000, 0.005, and 0.010 respectively. Since the p-value is less than the significance value 0.05, we reject the null hypothesis. This means that city, personal innovativeness and technology inclination significantly impact the continued use of mobile payments for merchants.

### 5.2.3 Results of objective three

Objective three: To find the impact of other variables on the continued use of mobile payment system

Statistical tools used- linear regression

**Table 5.5: Linear Regression of Consumers**

	Standardized Coefficients			Hypothesis support
Model	Beta	t	Sig.	
(Constant)		2.451	.015	
SI	.201	3.691	.000	H <sub>10</sub> : supported
GOVT	.153	2.815	.005	H <sub>12</sub> : supported
PU	.272	4.513	.000	H <sub>8</sub> : supported
PEOU	.141	2.235	.026	H <sub>9</sub> : supported
APP	.171	3.082	.002	H <sub>11</sub> : supported
MODEL DETAILS				
Adjusted R square= 0.563; F= 71.04 : Significance= 0.00				

Linear regression was done where I will continue using mobile payment was taken as the dependent variable and usefulness, ease of use, social influence, application provider and government initiatives as the five independent variables. The resultant model significantly predicted the continued use of mobile payment system by the consumers explaining 56.3% of the total variance. All the five variables were found to have a significant impact on the dependent variable.

**Table 5.6: Linear Regression of Merchants**

Model	Standardized Coefficients			Hypothesis support
	Beta	t	Sig.	
(Constant)		-3.087	.002	
U	.186	2.231	.027	H <sub>1</sub> 19: supported
CUST	.267	4.311	.000	H <sub>1</sub> 20: supported
APP	.327	5.174	.000	H <sub>1</sub> 21: supported
GOVT	.274	3.471	.001	H <sub>1</sub> 22: supported
MODEL DETAILS				
Adjusted R square= 0.622; F=54.85 : Significance=0.00				

Linear regression was done where I will continue using mobile payment was taken as the dependent variable and usability, consumer influence, application provider and government initiatives as the four independent variables. The resultant model significantly predicted the continued use of mobile payment system by the merchants explaining 62.2% of the total variance. All the four variables were found to have a significant impact on the continued use of mobile payment.

#### **5.2.4 Results of objective four**

Objective four: To find out the obstacles faced by merchants and consumers while using mobile payments.

Statistical tool used- Frequency

Result for consumers- Transaction failure and network failure were the most common obstacles for the respondents of both the city with more than 50% of the users facing these issues while accepting mobile payments.

Result for Merchants- Merchants of both the cities, prefer cash and card still to mobile payments. They also feel that there is less demand for mobile payments by the consumers group.

#### **5.2.5 Reasons of the non users for not using mobile payment system**

About 76% of consumers in Kolkata have installed mobile payment app in their mobile phone but 72% are using, while 68% of consumers have installed mobile payment app in Ranchi among which 64% are using it. So there is a gap of about 4% in both the city. According to techARC DIGIT report, there are some people who install app but never use it as they tend to install apps without giving much thought about it.

Maximum non-using consumers are the one who are still convenient with cash and card transactions. People are not using mobile payment because they are not convenient with either using a mobile phone or using mobile payment system, and finding mobile payment both useless and insecure. Further people who have abandoned mobile payment found mobile payment complex, time taking, insecure and useless. The feeling of insecurity among the non users is very high in case of Ranchi consumers, whereas for Kolkata non users, mobile payment is viewed as a complex procedure by majority of them. Most of the non users, who abandoned it are not willing to use mobile payment even if their issues get resolved.

Merchants too are mostly not using mobile payment due to their comfort with cash. Charges involved and no consumer demand were also reasons for not accepting mobile payment. Many merchants of Ranchi are not comfortable

with mobile payment, indicating a less tech-savvy population. Consumers demand for mobile payment is much higher in Ranchi city than in Kolkata.

## 5.2.6 Summary of Findings and Comparison with previous research findings

### 5.2.6.1 Summary of findings for Consumers and Merchants

**Table 5.7: Summary of findings**

Parameters	Ranchi Consumer		Kolkata Consumer		Ranchi Merchant		Kolkata Merchant	
	Yes	No	Yes	No	Yes	No	Yes	No
Awareness	90%	10%	92%	8%	95%	5%	99%	1%
Installation	68%	32%	76%	24%	68%	32%	80%	20%
Use	64%	36%	72%	28%	58%	42%	74%	26%
Feeling of risk by users	38%	62%	32%	68%	28%	72%	14%	86%

**Table 5.8: Summary of findings**

Parameters	Ranchi customer	Kolkata customer	Ranchi merchant	Kolkata merchant
Most preferred payment mode	Cash	Cash	Cash	Cash
Least preferred payment mode	Credit card	Net banking	Net banking	Net banking
Most used mobile payment app	PayTm	PayTm	PayTm	PayTm
Obstacles faced while using	Transaction & Network failure	Transaction & Network failure	Cash & cards still preferred, and less customer demand	Cash & cards still preferred, and less customer demand
Reason for not using	Convenient with cash and card	Convenient with cash and card	Not comfortable with mobile payment	Convenient with cash and card



### 5.2.6.2 Comparison of result with the previous literature findings

**Table 5.9: Result comparison with previous literature findings for consumers**

Customer	My findings	Similar to	Contradictory to
demographic variable of consumer with the awareness about mobile payment system	city, gender, and qualification have no significant relationship	Sumathy & Vipin (2017) for gender and qualification.  Kesh (2017) for gender	Kesh (2017) for qualification  Tiwari et al., 2019 for gender
	occupation, age, income and personal innovativeness have a significant relationship	Kesh (2017) for age & occupation  Tiwari et al., 2019 for age	
demographic variable of consumer with use of mobile payment system	there is no relationship of city,gender and educational qualification	Gender- mobile payment (Kabata,2015; Hamza and Shah,2015).Mobile banking( Vanisree,2013)	Vanisree, 2013 for education.
	there is relationship between age, occupation, income and personal innovativeness	Age- mobile banking (Vanisree,2013: Ashoka & Ramaprabha,2018) ; m-wallet – (Kabata,2015; Vasantha & Sarika., 2019)  Occupation-( Ashoka & Ramaprabha,2018)	Vanisree (2013)regarding income and profession
Other factors with continued use	usefulness, ease of use, social influence, application provider and government	PU & PEOU- internet banking (Yadav et al., 2015); e- payment/ m-payment (Sinha 2015; Bailey et al. 2017;Roy, 2017; Roy & Sinha, 2017);	Social influence- Roy & Sinha, 2017;  Vasantha & Sarika., 2019

	initiatives significantly impact the continued use of mobile payments for consumers.	Social Influence- internet banking (Yadav et al., 2015); Mobile payments (Thakur,2013;Phonthanuk itithaworn et al.,2016)	
--	--	--	--

**Table 5.10: Result comparison with previous literature findings for merchants**

Merchant	My findings	Other researcher
relationship between the use of mobile payment system and demographic variables	Gender, age, and technology inclination for merchants has no relationship with use  Use of mobile payment systems for merchants has significant association with city, qualification and personal innovativeness	Omotayo & Dahunsi, 2015 found no impact of demographics on use of mobile payments  Chogo and Sedoyeka, 2015, found age and qualification impact the use of m-payment.
Other factors with continued use	All the independent variables usability, consumer influence, application provider and government initiatives significantly impact the continued use of mobile payments for merchants.	Otieno and Kahonge, 2014 supported the impact of independent variables on use of m-payment

### 5.3 Managerial Implications and Suggestions

This research provides new dimensions in the mobile payment adoption research where the focus is primarily on the actual awareness and usage of mobile payment system with a comparative study within two cities with

different living standards, in India. Previous studies mostly focus on pre adoption of mobile payment systems not the actual use or post adoption (Yu et al., 2018). The geographical location selected for this study, i.e. Ranchi was never considered for any research of such kind in the past. This study presented the actual scenario of the mobile payment system of both cities and problems faced while using it. This would help in the formulation of strategies to boost mobile payments in the country and eliminate the obstacles in the growth of mobile payment systems. This research studied government initiatives which were new in the country so this can help in using this variable for another context of technology continuance study. Also, this research has worked on a major gap of not considering merchants in the mobile payment study by taking both merchant and consumers for the study. This new perspective could be used in the future in different contexts like mobile banking.

This research included the study of characteristics of both merchants and consumers and its impact on the usage of the mobile payment system. It is very important for the consumers and merchants to accept mobile payments in their lives for the vision of Digital India to come true. The more efficient and technologically upgraded the society is, the more advanced the nation will become. Also in this dynamic and evolving technological era, it is very important to be up-to-date with the current technology so that the nation should not be left behind in the race.

There is high level of awareness among both consumers and merchants but usage among both consumers and merchants are not upto the awareness level which means that though much of consumers and merchants are aware, all of them are not using it. So there is a gap which needs to be addressed. Further, significance percentage of merchant from both the city has abandoned the use of mobile payment due to insecurity in Ranchi and it was considered as a complex process for merchants of Kolkata.

As one of the most important factor affecting the continuance use of mobile payment is usefulness for consumers, mobile payment service providers need to advertise more on creating awareness about the benefits of the mobile payment systems (F. Liebana- Cabanillas et al., 2017; Humbani and Weise, 2017) to capture the vast market.

### **5.3.1 Implications for the Service Providers**

Both merchants and consumers feel that mobile payment is not widely accepted and used in their cities so it is high time that service providers try to capture both merchants and consumers simultaneously. Still, there is a tough competition to the mobile payment systems by the traditional modes of payment like cash and cards so mobile payment industry needs to work a lot on their promotions. Also, as both merchant and consumer that use mobile payment systems, showed trust in the service provider and do not find much risk in the use of mobile payment, this is the right time to expand the market with proper safe infrastructure to gain more trust.

These findings will help the mobile payment service providers companies to efficiently make strategies for the retention, growth and expansion of m-payments by solving the issues and making it penetrate well in the market, after clearly understanding the reasons for acceptance and non –acceptance of m-payments and why some people abandon the use of m-payments. Also as PayTm was found to be the most accepted mobile payments among both merchant and consumers group. PayTM is the most downloaded mobile payment app (Regalix, 2018) and seventh most Indian downloaded application among all kinds of apps (source: 42 matters). Also, PayTm has 50% of market share of merchant, till Aug 2020 (source: yourstory). This will help the other service providers to strategize their marketing plans and understand why still PayTm is the king and what keeps them lagging behind.

### **5.3.2 Implications for Government, Regulatory bodies and Policy makers**

As government initiative showed a positive impact on continuance of mobile payments for both merchants and consumers, government should continue creating awareness about the benefits of mobile payment systems for economy and giving relaxation to both merchants and service providers to facilitate wider acceptance of mobile payment systems. Also central government along with the state government should work on better safe infrastructure for the mobile payment system.

The study may be helpful to regulatory body and policy makers to create confidence in customer regarding mobile payment system. With the help of this study regulatory body can identify factors which play an important role in adoption of payment system. RBI can look into more strict policies and restriction on the mobile payment service providers to provide safe interface for the users so that more people could be motivated to use it for daily payments.

### **5.3.3 Implications for Merchants**

This research provides thorough study about the reasons why consumers do not use mobile payments and what are the problems faced by consumer while making payments through mobile. These findings can help merchant group to solve those issues at their end to enhance consumer's payment process experience.

### **5.3.4 Implications for Academic Institution**

The study can also help the institutions to design the courses related to technology used in financial services. Special course could be added in institution for imparting digital literacy and mobile technology. Knowledge about mobile payments is important as mobile payment is the future of

FINTECH in India. One such course for students will bridge the gap we find in the usage level of different tier cities so that each one is aware beforehand.

### **5.3.5 Implications for Researchers**

This research study has several important implications. From a theoretical perspective, the present study provides an important empirical step towards understanding the adoption and uses of Mobile payment system. The findings of this research bring out the significance of various factors which impact the actual use of mobile payment system which were not tested before. Factors of TAM Model and Government initiatives could be used as a starting point for models to include various other factors that have not been tested or evaluated before. Hence, the present study adds to the ongoing research on Mobile payment system.

### **Suggestions**

Following suggestion will lead to expansion and flourishing of m-payments industry and thus help in better financial inclusion which is urged by the present government to boost our economy.

- All the stakeholders involved need to play their role in the upliftment of the m-payments industry and try out ways to promote m-payments to boost the economy. Vigorous promotion of m-payments is needed by not only the government but also the m-payment service providers including the independent third party, banks, mobile network service providers. The finding of the research suggests that there is quite awareness about mobile payment system in both cities but the use is limited. The proper advertisement should be done and awareness should be created of the benefits of using m-payment and its impact on

boosting the economy. The awareness about the benefits of m-payments to the low income people and older people should be made and they should be further encouraged and provided with extra offers as these group are less using the mobile payment systems in comparison to the other groups.

- Network failure was found to be a major obstacle in this study, therefore, government and mobile network operators should strive to provide a secure and efficient infrastructure for m-payments. Transaction cost was a hindrance for few merchants so government and mobile network service providers should also make efforts to minimize it. Poor internet facility was further thought as a barrier by few people which is supported by Shukla, 2017 where he found that poor internet connectivity was major hinderance for m-payments success, so there is a need for strong secure and free wi-fi availability everywhere from big cities to small towns. Internet provider should work on their servers to give high-speed internet at every place.
- As maximum consumers feel that there is less encouragement from their merchants to use m-payments, more and more Merchants should be brought on board by the service provider and government because m-payment adoption is a two-way process. The more the merchant will adopt more the consumer will. M-payments should be accepted by every Kirana shop and Pan shops. Also, the merchant should take up the responsibility in uplifting the economy and encourage the consumers to use M-payments. Whereas the consumer too should opt for M-payments and demand M-payment platform from the merchants.

- Application service providers and payment gateways (e.g. Visa, RuPay) should try to make the transactions safe and secure for the user. They should call for immediate and successful transaction from their end to avoid multiple drops of transactions.
- The merchants who deal in heavy amount of transactions like electronics etc. do not accept mobile payment. So, this implies that mobile service providers should encourage and motivate merchants and consumers to opt mobile payment for heavy transactions also. Also, cashback and coupons were seen as a positive construct for use of mobile payment, so the mobile payment service provider can continue giving such lucrative offers to sustain their consumers and add on new consumers too. Also, the daily transaction limit was concern for the merchants and therefore government should push the limit to high so the larger amount transaction can be made through m-payments.
- In the future there can be the creation of one single solution m-payments where people will not have to download multiples of payment apps as this research study found out that consumers need cross wallet transfer.

## **5.4 Limitations & Future Scope**

### **5.4.1 Limitations of the research**

While this research was a new of its kind it also has multiple limitations which need to be mentioned below to provide fruitful avenues for future research.



First and foremost the researcher studied the acceptance of mobile payments by two most vital elements for the prosperity of mobile payments industry among the various players of mobile payments ecosystem i.e, merchant and consumer which bring in the limitation of not considering the other elements of the ecosystem like mobile payment service providers, mobile network operators, financial institution, govt etc.

Second limitation was that this study has focused on detail study for users while only few questions were asked to the non users therefore non users are not much explored in this study which brings in another limitation.

Thirdly, another limitation is that India though being home of many cities this study was conducted within geographical boundaries of only two capital cities of two states of India. The results may vary if larger geographical area is considered. Also, total sample size of the respondent was taken as 600, which is very less to generalise the vast population of both the cities.

Fourth limitation was with the sampling technique used which was convenience sampling which further adds to the limitation of this research.

The research has been carried considering only smart phone as a mobile payment option, and not normal feature phones and any other PDAs. Also, time frame of data collection is another limitation as there may be variations in the finding due to changes made after the data collection period in the mobile payment industry. As after 2018 many changes have taken place in this industry such as new entrants in mobile payment providers, conversion of wallets to UPI, change in KYC rules, increased relaxation for merchants, recent COVID pandemic etc. Also this research lacked development of theoretical model which the researchers are working on currently.

#### **5.4.2 Future Recommendations**

This study has primarily focused on dual aspects of mobile payment systems and two parties of the mobile payment ecosystem i.e. merchants and consumer providing a valuable insight about the merchants and consumers acceptance in the Indian context. The findings can be used as a foundation for such type of

research in future. In future researcher could further explore various stakeholders of mobile payments together in the Indian context.

Also, comparison study could be made upon more than 2 states and cities in India to get a broader generalized picture about the acceptance of mobile payments system. Moreover rural and urban areas could also be compared to understand the penetration of mobile payment. Mobile payments can be studied in multi countries in same continent or different continents with different cultures and city.

The future researcher could also study and compare various technologies used in mobile payment simultaneously and various m-payments available in market.

The future study could be done focusing on the non users, with detailed study in this field. Also a comparative study can be done among the challenges and issues faced by both users and non users regarding mobile payments.

Data could be collected in different times and pos scenarios in the future and assessed to understand if there is an impact of different scenarios like busy pos or no busy pos and long queues at pos or short queues at pos.

Also different types of merchants like small, medium, big enterprises can be considered for future study and compared for acceptance level of mobile payment systems.

Also the recent pandemic COVID became a blessing in disguise for mobile payments where people feared use of cash and cards. So, a fresh study can be done to study the impact of COVID on mobile payment industry. Also, comparison can be done between the scenario of post and pre COVID pandemic.

## **5.5 Conclusion**

Mobile payment industry has witnessed a lot of transformation in the last two decades. A lot of reforms came in last five years from launch of UPI to demonetization, lowering of MDR charges to making it zero for UPI.

Government has tried hard to educate people about benefits of going cashless and digital through its various tutorials, awareness programmes. RBI too through its campaigns such as UPI chalega etc has promoted mobile payments. Further reform in its ecosystem with cheaper internet plans to cheaper smartphones, have all made a favourable scenario for this industry to blossom. Mobile payment service providers are competing with each other by luring customers with offers and discounts of all kinds. Also they are trying hard in getting merchants on board. PayTm which was king till 2018 is getting tough competition from Google Pay in customer segments and PhonePe in merchants segments. Recently Whatsapp too have launched its mobile payments which may become a big threat to all existing players as the kind of popularity it has among Indians.

Consumers have accepted the benefits of mobile payments and are using it for many things such as payment for utilities to payment of shopping, entertainments, mobile recharge, shopping etc. These days mobile payments have come up with various other options than just payments such as mutual fund investments with freecharge, PayTm has opened its payment bank, offers digital gold, insurance, shopping, investments etc. So there are yet lots of opportunities to be catered by this industry in near future from just a payment service provider.

The most important reasons for using mobile payment among consumers were easy to use and quicker payment option. Getting cashbacks and giving support to cashless India also were found to be the reasons of usage. Moreover, merchant uses mobile payment system as their customers demand for such payments. Also they find it easy to adopt and transferring money through it is easy.

For consumers, demographic factors such as gender and educational qualification has no influence on the awareness and use of mobile payment

system whereas it was found that people above the age of 60 are less aware and thus are less using the mobile payments. The one who are not much technically inclined are also not using mobile payment much. People with monthly income below rs 10000 and unemployed are also among the less users. So, these sections of people should be targeted and utility of mobile payments should be explained to them. Merchants of both gender, all age groups and with any type of educational qualification are well aware about mobile payment but the one with lower degree than intermediate are less using it. Service providers should target the merchants who are not that educated and make them aware about the benefits of using mobile payments for their business and society. Further it was found out that consumers of both cities are equally aware about mobile payment system and using it but in case of merchants though there is no difference in the awareness level about mobile payments within the cities but there is significance difference in the use of mobile payments by merchants of both the city where Ranchi merchants are less using it. Therefore, Ranchi merchants need to be focused more by the service providers.

Also all the other variables like usefulness, ease of use, social influence, government initiatives, application providers were found to have strong influence on the continuance use of mobile payments by consumers. Usefulness and social influence were the strongest predictors among all five variables. For merchants, consumer influence and application provider were the strongest predictors of continued use mobile payment systems, followed by government initiatives and usability.

Both merchants and consumers have shown trust in their application providers and majority of them do not find risk in using mobile payments. Also maximum people keep their wallet preloaded which is further sign of trust on their app providers. Major hinderance is regarding the network failure and transaction failure so the service providers have to collaborate well with

the telecom providers to solve these issues and provide hassle free transactions to the users. In spite of all benefits mobile payment offer and the fact that the users trust their mobile payment service providers, cash still is the ruler because of the habit, ease and free from technical glitches. Therefore, it is important for the other payment methods to cope up with cash.

It is understood from this research that mobile payment is a known terminology for Indians and people have also accepted it for daily payments. Further as mobile phones are the new habit and lifestyle of people, mobile payments can be expected to grow exponentially in coming future. Mobile payment has proved to be a savior in tough times like demonetization in past and COVID recently. ATM cash withdrawals have witnessed a drop after the hit of COVID and there has been a tremendous increase in the UPI transactions since then. According to Business standard UPI volume has almost doubled since last year. So, its high time mobile payment service provider should utilize these opportunity and make mobile payment part and parcel of everybody's life. Also its important for all players of the mobile payment ecosystem to join hands and play their part and create not only the awareness but educate people how to operate such payment system along with its utilities for both people and economy.

# **BIBLIOGRAPHY**

## **Books**

1. Malhotra, N. K., & Dash, S., (2011) Marketing Research, An Applied Orientation. 6<sup>th</sup> Edition, Pearson, India.
2. Kothari, C.R. & Garg, G. (2014). Research Methodology: Methods and Techniques (3rd edition). New Delhi: New Age International (P) Ltd.

## **E-Books**

3. Bhattacharjee, Anol. (2012). Social Science Research: Principles, Methods, and Practices Textbooks Collection. Book3
4. Creswell, J. W. (2009). Research Design: Qualitative and Quantitative Approaches (Second Edition). Thousand Oaks, CA, USA: SAGE Publications Inc.
5. Creswell, J. W. (2014) Research design: qualitative, quantitative and mixed methods approaches (fourth edititon). *Sage publications*,
6. Mack, N., Woodsong, C., MacQueen, K.M., Guest, G., & Namey, E., (2005), Qualitative Research Methods: A Data Collector's Field Guide. ISBN: 0-939704-98-6.
7. Pallant, J. (2005). SPSS survival manual: a step by step guide to data analysis using SPSS. Allen & Unwin Publication
8. Turowski, K., & Pousttchi, K. (2004). Mobile Commerce: Basics and Techniques. (Mobile Commerce: Grundlagen und Techniken), Springer, Heidelberg, Germany.
9. Rogers, E. M. (2010). *Diffusion of innovations* (4th ed.). Simon and Schuster.

## **Ph. D Thesis**

1. Abadzhmarinova, R.S. (2014). Exploring the effect of speed of purchase on consumers' intention to adopt NFC mobile payments, *Copenhagen Business School*.
2. Ahrenstedt, S., Huang, J., & Wollny, L. (2015). A study on factors influencing the acceptance of mobile payment applications in Sweden. *Jonkoping University*.
3. Au, Y.A., & Zafar, H. (2008). A Multi-Country Assessment of Mobile Payment Adoption. *UTSA College of Business Working Paper Series*.
4. Kesh, S.P. (2017). Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Bengaluru City. *ICFAI University Jharkhand Ranchi*.
5. Hampshire, C. (2016). Exploring UK consumer perceptions of mobile payments using smart phones and contactless consumer devices through an extended technology adoption model. (Doctoral dissertation). *University of Chester, United Kingdom*.
6. Luna, I.R., (2017). Mobile payments at the point of sale: Key issues, perspectives and guidelines for future users adoption, *University of Granada*
7. Shaw, B. (2018). Moderating Effects of Situational Variable and Smartphone Addiction on the Factors Influencing Consumers' Intention to Continued Use of Mobile Payment Services in India. *ICFAI Foundation for Higher Education, Hyderabad*.
8. Sidek, N. (2015). Determinants of Electronic Payment Adoption in Malaysia: The Stakeholders' Perspectives. *The University of Queensland, School of Agriculture and Food Science*.



9. Thoi, M. (2016). Exploring merchants' adoption of mobile payments: A qualitative study on Swedish merchants' perspectives. *University of Gothenburg, Sweden.*

## Conferences

1. Ahsan, A., Chang, V., & Issa, T. (2012). Community Perception of Mobile Payment in Government Services. *23rd Australasian Conference on Information Systems. 3-5 Dec 2012, Geelong.*
2. Amoroso, D. L. (2010). Mobile Payment Industry: Toward a Comprehensive Research Model, *Annual Conference of Japan Society for Management Information 2010 Autumn.*
3. Andreev, P., Duane, A., and O'Reilly, P., (2011). Conceptualising consumer perceptions of contactless m-payments through smart phones. *International Federation for Information Processing: IFIP WG8.2.*
4. Aydin, G., and Burnaz, S. (2016). Innovativeness Impact on Attitude Development Towards Mobile Payment Applications. *Conference Paper, 204-211.*
5. Chen, J.J., & Adams, C. (2005). User Acceptance of Mobile Payments: A Theoretical Model for Mobile Payments. *Proceedings of the Fifth International Conference on Electronic Business, 619 - 624.*
6. Dahlberg, T., & Mallat, N. (2002). Mobile Payment Service Development- Managerial Implications of Consumer Value Perceptions, *ECIS. 649-657.*
7. Dahlberg, T., & Oorni, A. (2006). *Understanding Changes in Consumer Payment Habits- Do Mobile Payments Attract*

- Consumers?* Proceedings of Helsinki Mobility Roundtable. Sprouts: Working Papers on Information Systems, 6(36).
8. Dahlberg, T., & Oorni, A., (2007). Understanding changes in consumer payment habits: Do mobile payments and electronic invoices attract consumers? In: Proceedings of the 40<sup>th</sup> Annual Hawaii International Conference on System Sciences. 1-10.
  9. Dai, H., Singh, R., & Iyer, L. (2007). Intention to Use Mobile Commerce: A Demographic Analysis of the Chinese Market. *AMCIS 2007 Proceedings*. 263.
  10. Diniz, E.H., Albuquerque, J.P., & Cernev, A.K. (2011). Mobile Money and Payment: a literature review based on academic and practitioner-oriented publications (2001-2011). *Proceedings of SIG GlobDev Fourth Annual Workshop, Shanghai, China*.
  11. Gan, C. (2016). The Impact of Use Context on Mobile Payment User Adoption: An Empirical Study in China. *The Fifteenth Wuhan International Conference on E-Business — Mobile Technologies and Ubiquitous Services Proceedings*, 31, 264-271.
  12. Harris, M A., Chin, A. G., & Beasley, J. (2019). Mobile Payment Adoption: An Empirical Review and Opportunities For Future Research. *Proceedings of the Southern Association for Information Systems Conference, St. Simon's, Island, GA, USA March 22nd–23rd, 2019*, 1-6.
  13. Heijden, H. (2002). Factors Affecting the Successful Introduction of Mobile Payment Systems. *15th Bled Electronic Commerce Conference Reality: Constructing the eEconomy Bled, Slovenia*.

14. Hu, X., Li, W., & Hu, Q. (2008). Are Mobile Payment and Banking the Killer Apps for Mobile Commerce? Proceedings of the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008).
15. Jinkyung, H. (2018). Consumer valuation of Fintech: The case of Mobile Payment in Korea. *22nd Biennial Conference of the International Telecommunications Society (ITS): "Beyond the Boundaries: Challenges for Business, Policy and Society"*, Seoul, Korea, 24th-27th June, 2018, *International Telecommunications Society (ITS)*, Calgary.
16. Karsen, M., Chandra, Y. U., & Juwitasary, H. (2019). Technological Factors of Mobile Payment: A Systematic Literature Review. *4th International Conference on Computer Science and Computational Intelligence 2019 (ICCSCI)*, 12–13 September.
17. Krueger, M. (2001). The future of m-payments – business options and policy issues. *Electronic Payment Systems Observatory (ePSO) Institute for Prospective Technological Studies*.
18. Kurnia, S. & Ali, M. (2012). B2B e-commerce adoption by the grocery industry in developing countries: Indonesia versus Bahrain. Paper presented at System Science (HICSS) 45th Hawaii International Conference on. 4-7 Jan. 2012.
19. Lai, P.M., & Chuah, K.B. (2010). Developing an Analytical Framework for Mobile Payments Adoption in Retailing: A Supply-Side Perspective. *International Conference on Management of e-Commerce and e-Government*, 356-361.

20. Li, H., Liu, Y. and Heikkila, J. (2014). Understanding the factors driving NFC-enabled mobile payment adoption: An empirical investigation. *Pacific Asia Conference on Information Systems (PACIS) 2014 Proceedings*, 231.
21. Mallat, N. (2006). Exploring Consumer Adoption of Mobile Payments – A Qualitative Study. Proceedings of Helsinki Mobility Roundtable. Sprouts: Working Papers on *Information Systems*, 6(44).
22. Ondrus, J., Lyytinen, K., & Pigneur, Y. (2009). Why mobile payments fail? towards a dynamic and multi--perspective explanation. In: Proceedings of the 42nd Annual Hawaii International Conference on System Sciences (HICSS). IEEE Computer Society Press, Washington, DC.
23. Pal, D., Vanijja, D., & Papasratorn, B. (2015). An Empirical Analysis towards the Adoption of NFC Mobile Payment System by the End User. *The 7th International Conference on Advances in Information Technology*, Procedia Computer Science 69 (2015) 13 – 25.
24. Petrova, K., & Mehra, R. (2010). Mobile Payment: An Exploratory Study of Consumer Attitudes. Wireless and Mobile Communications (ICWMC), 2010 6th International Conference.
25. Pham, T. T. T., & Ho, J. C. (2015, July). What are the core drivers in consumer adoption of NFC-based mobile payments?: A proposed research framework. In *Management of engineering & technology (PICMET), Portland International Conference on*, 3041-3049.

26. Pousttchi, K. (2003). Conditions for acceptance and usage of mobile payment procedures. *In proceedings of the Second International Conference on Mobile Business (mBusiness)*. 201-210.
  
27. Pousttchi, K., & Schurig, M. (2004). Assessment of today's mobile banking applications from the view of consumer requirements. *Proceedings of the 37th Annual Hawaii International Conference on System Sciences*. IEEE, 1-10.
  
28. Pousttchi, K., & Wiedemann, D. G. (2007). What Influences Consumers' Intention to Use Mobile Payments. *LA Global Mobility Round table*.
  
29. Resendiz, R.M. (2017). The role of payment systems and services in financial inclusion – the Latin American and Caribbean perspective. *IFC Satellite Seminar*.
  
30. Rogers, E.M. (2002). Diffusion of preventive innovations. Addictions 2002 Conference on Integrating Substance Abuse Treatment and Prevention in the Community, Eindhoven, The Netherlands, September 15–17.
  
31. Sahu, G., & Singh. N. K. (2017). Paradigm Shift of Indian Cash-Based Economy to Cash-Less Economy: A Study on Allahabad City. *16th Conference on e-Business, e-Services and e-Society (I3E)*, 453-461.
  
32. Satinder & Niharika, (2015). The Impact of Mobile Commerce In India: A SWOT Analysis. *2nd International Conference on Science, Technology and Management*, New Delhi. 2503-2513.

33. Shaw, N. & Sergueeva, K., (2016). Convenient or Useful?. Consumer Adoption of Smartphones for Mobile Commerce. *DIGIT 2016 Proceedings*.
34. Shaw, N. (2015). Younger Persons are More Likely to Adopt the Mobile Wallet than Older Persons, or are they? The Moderating Role of Age. *Twenty-first Americas Conference on Information Systems, Puerto Rico*, 1-15.
35. Tiwari, P., Garg, V., & Singhal, A. (2019). A study of Consumer adoption of Digital Wallet special Reference to NCR. 9th International Conference on Cloud Computing, Data Science & Engineering (Confluence) IEEE 2019, 664-669
36. Tiwari, R., Buse, S., & Herstatt, C.H. (2007). Mobile services in banking sector: the role of innovative business solutions in generating competitive advantage. Proceedings of the International Res Conference on Quality, Innovation and Knowledge Management. New Delhi; 200, 886–94.
37. Williams, M., Rana, N., Dwivedi, Y. & Lal, B. (2011). Is UTAUT really used or just cited for the sake of it? A systematic review of citations of UTAUT's originating articles. *ECIS 2011 Proceedings*. 231. <https://aisel.aisnet.org/ecis2011/231>.
38. Yeh, M.L., & Tseng, Y.L. (2017). The College Students' Behavior Intention of Using Mobile Payments In Taiwan: An Exploratory Research. Proceedings of IASTEM International Conference, Singapore, January 2017.
39. Zhong, J. (2009). A comparison of mobile payment procedures in Finnish and Chinese markets. Proceedings of the 22nd Bled

eConference eEnablement: Facilitating an Open, Effective and Representative eSociety, Bled.

### **Journals/Articles**

40. Abayomi, A. C., Olabode, A.C., Reyad, M. A. H., Teye, E.T., Haq, M. N, & Mensah, E. T. (2019). Effects of Demographic Factors on Consumers' Mobile Banking Services Adoption in Nigeria. *International Journal of Business and Social Science*, 10(1), 63-71.
41. Ajzen, I. (1991).The theory of planned behavior.*Organisational Behaviour and Human Decision Process*, 50(2), 179-211.
42. Alafeef, M., Singh, D., & Ahmad, K. (2011). Influence of demographic factors on the adoption level of mobile banking applications in Jordan.*Research Journal of Applied Sciences*, 6(6), 373-377.
43. de Albuquerque, J.P., Diniz, E.H., & Cernev, A.K.(2016). Mobile payments: a scoping study of the literature and issues for future research. *Information Development*, 32(3), 527-553.
44. Anthony, D., & Mutalemwa, D. K. (2014). Factors influencing the Use of Mobile Payments in Tanzania: Insights from Zantel's Z-pesa services. *The Journal of Language, Technology & Entrepreneurship in Africa*, 5(2), 69-90.
45. Arun, T., & Kamath, R. (2015). Financial inclusion: Policies and practices. *IIMB Management Review*, 27(4), 267-287.

46. Arvidsson, N. (2014). Consumer attitudes on mobile payment services – results from a proof of concept test. *International Journal of Bank Marketing*, 32 (2), 150-170.
47. Ashoka, M.L., & Ramaprabha, D. (2018). A study of tam model in the usage of mobile banking services. *International Journal of Advanced Research and Development*, 3(1), 109-113.
48. Au, Y. A., & Kauffman, R. J. (2008). The economics of mobile payments: Understanding stakeholder issues for an emerging financial technology application. *Electronic Commerce Research and Applications*, 7 (2), 141–164.
49. Aydin, G., & Burnaz, S. (2016). Adoption of Mobile Payment Systems: A Study On Mobile Wallets. *Journal of Business, Economics and Finance*, 5(1), 73-92.
50. Bailey, A. A., Pentina, I., Mishra, A. S., & Mimoun, M. S. B. (2017). Mobile payments adoption by US consumers: an extended TAM. *International Journal of Retail & Distribution Management*, 45 (6), 1-17.
51. Balachandran, D., & Tan, G-W-H. (2015). Regression modelling of predicting NFC mobile payment adoption in Malaysia. *International Journal Modelling in Operations Management*, 5(2), 100–116.
52. Barutcu, S. (2008). Consumers’ attitudes towards mobile marketing and mobile commerce in consumer markets. *Ege Academic Review*, 8 (1), 15–32.
53. Begonha, D.B., Hoffmann, A., & Melin, P. (2002). M-Payments: Hang up, try again. *Credit Card Management*, 15(4), 40-44.



54. De Bel, J., & Gâza, M. (2011). Mobile Payments 2012 - My mobile, my wallet? *Innopay*. Version 1.01.
55. Bezhovski, Z. (2016). The Future of the Mobile Payment as Electronic Payment System. *European Journal of Business and Management*, 8(8), 127-132.
56. Bourreau, M., & Verdier, M. (2010). Cooperation for Innovation in Payment Systems: The Case of Mobile Payments. *Communications & strategies*, 79(3), 95-113
57. Brahmabhatt, M. (2018). A Study on Consumers' Perception towards E-Wallets in Ahmedabad City, *IUJ Journal of Management*. 6(1), 11-15
58. Burhan, U. I. K., Olanrewaju, R. F., Baba, A. M., Langoo, A. A., & Assad., S. (2017). A Compendious Study of Online Payment Systems: Past Developments, Present Impact, and Future Considerations. *International Journal of Advanced Computer Science and Applications*, 8(5), [256-271](#).
59. Burke, R.R. (2002). Technology and the Consumer Interface: What Consumers Want in the Physical and Virtual Store. *Journal of the Academy of Marketing Science*, 30(4), 411-432.
60. Cabanillas, F.L., Luna, I. R., & Ríos, F. M. (2017). Intention to use new mobile payment systems: a comparative analysis of SMS and NFC payments. *Economic Research-Ekonomska Istraživanja*, 30(1), 892-910.
61. Cabanillas, F. L., Leiva, F.M., & Fernández, J.S. (2017). Examining Merchants' Refusal to Adopt Mobile Payment Systems in Spain. *Intech*, 113-136.

62. Carr, M. (2007). Mobile Payment Systems and Services: An Introduction. In *Mobile Payment Forum*, 1-12.
63. Chale, P.R., & Mbamba, U. (2014). The Role of Mobile Money Services on Growth of Small and Medium Enterprises in Tanzania: Evidence from Kinondoni District in Dar Es Salaam Region. *Business Management Review*, 17, 81-96.
64. Chandrasekhar, U., & Nandagopal, R. (2013). Mobile Payments At Retail Point Of Sale - An Indian Perspective. *Life Science Journal* 2013, 10(2).2684- 2688.
65. Chandra, S., Srivastava, S.C., & Theng, Y. L. (2010). Evaluating the Role of Trust in Consumer Adoption of Mobile Payment Systems: An Empirical Analysis. *Communications of the Association for Information Systems*, 27(1), 561-588.
66. Chan, F., & Chong, Y. (2013). Analysis of the determinants of [consumers'](#) m-commerce usage activities. *Emerald Group Publishing Limited, Online Information Review*, 37(3), 441–466.
67. Chen, L., & Nath, R. (2008). Determinants of Mobile Payments: An Empirical Analysis. *Journal of International Technology and Information Management*, 17(1), 9-20.
68. Cheong, J., & Park. M. (2005). Mobile Internet acceptance in Korea. *Internet Research*, 15 (2), 125–140.
69. Chogo, P.J., & Sedoyeka, E. (2015). Exploring Factors Affecting Mobile Money Adoption in Tanzania. *International Journal of Computing and ICT Research*, 8(2), 53-64.

70. Chong, S.C., Tan, K.S., Lin, B., & Eze, U.C. (2010). Internet-based ICT adoption among SMEs Demographic versus benefits, barriers, and adoption intention. *Journal of Enterprise Information Management*, 23(1), 27-55.
71. Choudrie, J., & Dwivedi, Y. K. (2005). Investigating the research approaches for examining technology adoption issues. *Journal of Research Practice*, 1(1), D1: 1-12.
72. Cliquet, G., Picot-Coupey, K., Hure, E., & Gahinet, M. (2014). Shopping with a Smartphone: A French-Japanese Perspective. *Marketing ZFP*, 36(2), 96 – 106.
73. Cracknell, D. (2004). Electronic banking for the poor- panacea, potential and pitfalls. *Small Enterprise Development*, 15(4), 8-24.
74. Crowe, M., Rysman, M., & Stavins, J.(2010). Mobile Payments at the retail point of sale in the United States: Prospects for adoption. *Review of Network Economics*, 9(4), Art.2.
75. Dahlberg, T., Guo, J., & Ondrus, J.(2015). A critical review of mobile payment research. *Electronic Commerce Research and Applications*, 14(5), 265-284.
76. Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2007). Past, present and future of mobile payments research: A literature review.*Electron. Comm. Res. Appl*, 10(10),16-21.
77. Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Mobile Payment Market and Research - Past, Present and Future. *All Sprouts Content*. 6(48), 1-16.
78. Dai, H., & Palvia, P. C. (2009). Mobile Commerce Adoption in China and the United States: A Cross-Cultural Study. *The DATA BASE for Advances in Information Systems*, 40(4), 43-61.

79. Dash, M., Bibhuti, B., & Samal, S. (2014). Determinants of Consumers' Adoption of Mobile Banking: An Empirical Study by Intergrating Diffusion of Innovation with Attitude. *Journal of Internet Banking and Commerce*, 19(3), 1-21.
80. Davis, F. (1989). Perceived usefulness, perceived ease of use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319–340.
81. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Manage. Sci.*, 35(8), 982–1003.
82. Dennehy, D. & Sammon, D. (2015). Trends in mobile payments research: A literature review. *Journal of Innovation Management*, 3(1). 49-61
83. Deutskens, E., Ruyter, K., Wetzels, M, & Oosterveld, P. (2004). Response rate and response quality of internet-based surveys: An experimental study. *Marketing Letters*, 15(1), 21-36
84. Dewan, S. G., & Chen, L. D. (2005). Mobile payment adoption in the US: A cross-industry, cross-platform solution, *Journal of Information Privacy and Security*, 1(2), 4-28.
85. Donner, J.,& Tellez, C.A. (2008). Mobile banking and economic development: Linking adoption, impact, and use. *Asian Journal of Communication*, 18 (4), 318-322.
86. Dr. S. Manikandan., & J.Mary Jayakodi. (2017). An Empirical Study On Consumers Adoption of Mobile Wallet with Special

- Reference to Chennai City. *International Journal of Research-Granthaalayah*, 5(5), 107-115.
87. Duane, A., O'Reilly, P., & Andreev, P. (2014). Realising M-Payments: modelling consumers' willingness to M-pay using Smart Phones. *Behaviour & Information Technology*, 33(4), 318-334.
  88. Eswaran, K.K. (2019). Consumer Perception Towards Digital Payment Mode with Special Reference to Digital Wallets. *Research Explorer-A Blind Review & Refereed Quarterly International Journal*, 5(22), 13-20.
  89. Falke, O., Rukzio, E., Dietz, U., Holleis, P., and Schmidt, A., Mobile Services for Near Field Communication. *Technical Report, Ludwig-Maximilians-Universität (LMU) Munich, Germany, March 2007, LMU-MI-2007-1, ISSN 1862-5207.*
  90. Foroughi, B., Iranmanesh, M., & Hyun, S.S. (2019). Understanding the determinants of mobile banking continuance usage intention. *Journal of Enterprise Information Management*, 32(6), 1015-1033.
  91. Gallardo, R. K., Olanie, A., Ordóñez R., & Ostrom M. (2015). The Use of Electronic Payment Machines at Farmers Markets: Results from a Choice Experiment Study. *International Food and Agribusiness Management Review*, 18(1), 79-102.
  92. Ghezzi, A, Renga, F, Balocco, R & Pescetto, P. (2010). Mobile payment applications: offer state of the art in the Italian market. *info*, 12(5), 3-22.

93. Goundar, S. (2012). Cloud Computing: Understanding the Technology before Getting “Clouded”. In *Recent Progress in Data Engineering and Internet Technology*, 217-222.
94. Goyal, V., Pandey U.S., & Batra, S. (2012). Mobile banking in India: Practices, Challenges and security issues, *International Journal of Advanced Trends in Computer Science and Engineering*, 1(2), 56-64.
95. Gupta, R., Gupta, B.M., & Kumar, A. (2017). Mobile Payment Research: A Scientometric Assessment of Global Publications Output during 2007-16. *International Journal of Information Dissemination and Technology*, 7(2). 110-115.
96. Grover, V. K. (2015). Research Approach: An Overview. *Golden Research Thought*, 4(8), 1-8.
97. Guo, J., & Bouwman, H. (2015). An analytical framework for an m-payment ecosystem: A merchants' perspective. *Telecommunications Policy Elsevier*, 40(2), 147–167.
98. Hamza, A., & Shah, A. (2014). Gender and Mobile Payment System Adoption among Students of Tertiary Institutions in Nigeria. *International Journal of Business and Management*, 3(1), 13-20.
99. Hanafizadeh, P., Keating, B. W., & Khedmatgozar, H. R. (2013) A systematic review of Internet banking adoption. *Telematics and Informatics*, 31(3), 492-510.

100. Hayashi, F. (2012). Mobile Payments: What's in It for Consumers? *Federal Reserve Bank Of Kansas City, Economic Review*, 97( 1), 35-66.
101. Hayashi, F., & Bradford, T. (2014). Mobile Payments: Merchants' Perspectives. *Federal Reserve Bank of Kansas City, Economic Review*, Q2, 5-30.
102. Humbani, M., & Wiese, M. (2018). A Cashless Society for All: Determining Consumers' Readiness to Adopt Mobile Payment Services. *Journal of African Business*, 19(3), 409-429.
103. Im, I., Hong, S., & Kang, M. S. (2011). An international comparison of technology adoption: Testing the UTAUT model. *Information & Management*, 48(1), 1-8.
104. Islam, M.A., Khan, M.A., Ramayah, T., & Hossain, M. M. (2011). The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh: Self-efficacy as A Moderator. *International Business Research*, 4(2), 80-89.
105. Islam, M. M. (2016). An Investigation of Drivers and Barriers Stimulating in the Acceptance of Mobile Payment in Bangladesh. *Universal Journal of Industrial and Business Management*, 4(4), 104-113.
106. Ivatury, G., & Mas, I. (2008). The early experience with branchless banking. *CGAP Focus Note*, (46), 1-16.
107. Jain, P., & Singhal, S. (2019). Digital Wallet Adoption: A Literature Review. *International Journal of Management Studies*, 6(1), 1-11.

108. Jaradat, M. I. R. M., & Faqih, K. M. S. (2014). Investigating the Moderating Effects of Gender and Self-Efficacy in the Context of Mobile Payment Adoption: A Developing Country Perspective. *International Journal of Business and Management*, 9(11), 147-169.
109. Jeong, B. K., & Yoon, T. E. (2013). An empirical investigation on consumer acceptance of mobile banking services. *Business and Management Research*, 2(1), 31-40.
110. Kabata, D. (2015). Determinants of mobile payment use by consumers in Kenya. *International Journal of Computer Applications & Information Technology*, 8(1), 152–159.
111. Kapoor, K., Dwivedi, Y.K., & Williams, M.D. (2013). Role of Innovation Attributes in Explaining the Adoption Intention for the Interbank Mobile Payment Service in an Indian Context. *Berlin Heidelberg: Springer*, 203–220.
112. Kapoor, K., Dwivedi, Y. & Williams, M. D. (2015). Examining the role of three sets of innovation attributes for determining adoption of the interbank mobile payment service. *Information Systems Frontiers*, 17(5), 1039-1056.
113. Karnouskos, S. & Fokus, F. (2004). Mobile Payment: A Journey Through Existing Procedures And Standardization Initiatives. *IEEE Communications Surveys & Tutorials*, 6(4), 44-66.
114. Karnouskos, S., & András Vilmos, A., Universal Approach to Mobile Payments. *Mobile Computing: Concepts, Methodologies, Tools, and Applications*, Pages: 9 DOI: 10.4018/978-1-60566-054-7.ch182



115. de Kerviler, G., Demoulin, N.T.M., & Zidda, P. (2016). Adoption of in-store mobile payment: Are perceived risk and convenience the only drivers? *Journal of Retailing and Consumer Services*, 31(C), 334-344.
116. Kim, Y. (2010). The Pilot Study in Qualitative Inquiry: Identifying Issues and Learning Lessons for Culturally Competent Research. *Qualitative Social Work OnlineFirst*, 10(2), 190-206.
117. Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior*, 26(3), 310-322.
118. Kim, C., Tao, W., & Shin Kim, K. (2010). An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic Commerce Research and Applications*, 9(1), 84-95.
119. Kim, Y., Choi, J., Park, Y.J., & Yeon, J. (2016). The Adoption of Mobile Payment Services for "Fintech". *International Journal of Applied Engineering Research*, 11(2), 1058-1061.
120. Kumar, R., Rishi, R., & Kumar, M. (2012). Impact of Mobile Commerce & Its Application with Security in Indian Context. *International Journal of Recent Trends in Mathematics & Computing*, 1(1), 1-5.
121. Kumar, K., Sivashanmugam, C., & Venkataraman, A. (2017). Intention to Use Mobile Wallet: Extension of Tam Model. *International Journal of Current Engineering and Scientific Research*, 4 (12), 5-11.

122. Lai, W., & Li, C. (2015). Technology Acceptance Model for Internet Banking: An Invariance Analysis, *Information & Management*, 42(2), 373-386.
123. Lai, P. C. (2017). The Literature Review Of Technology Adoption Models And Theories For The Novelty Technology. *Journal of Information Systems And Technology Management*, 14(1), 21-38.
124. Lee, Y., Park, J., Chung, N., & Blakeney, A. (2012). A unified perspective on the factors influencing usage intention toward mobile financial services. *Journal of Business Research* 65(11), 1590–1599.
125. Lee, H. J., Shin, J. I., Kou, K. S., & Ryu, C. H. (2014). Criteria Requirements of Mobile Payment Application. *Journal of Security Engineering*, 11(1), 79-88.
126. Leong, L. Y., Ooi, K. B., Chong, A. Y. L., & Lin, B. (2013). Modeling the stimulators of the behavioral intention to use mobile entertainment: Does gender really matter? *Computers in Human Behavior*, 29(5), 2109–2121.
127. Lesa, E., & Tembo, S. (2016). Study on Factors Affecting Mobile Payment Systems Diffusion in Zambia. *Management*, 6(2), 36-45.
128. Leung, L., & Wei, R. (2000). More than just talk on the move: Uses and gratifications of the cellular phone. *Journalism and Mass Communication Quarterly*, 77(2), 308-320.
129. Li, J., Liu, J. L., Yong, J. H. (2014). Empirical Study of Influence Factors of Adaption Intention of M-payment based on TAM Model in China. *International Journal of u- and e- Service, Science and Technology*, 7(1), 119–132.

130. Liaw, S. (2002). An Internet Survey for Perceptions of Computers and the World Wide Web: Relationship, Prediction and Difference. *Computers in Human Behavior*, 18(1), 17-35.
131. Liébana-Cabanillas, F., Muñoz-Leiva, F., & Sánchez-Fernández, J. (2015). Influence of age in the adoption of new mobile payment systems. *Revista brasileira de gestão de negócios*, 17(58), 1390–1407.
132. Liébana-Cabanillas, F., Ramos de Luna, I., Montoro-Ríos, F. (2017). Intention to use new mobile payment systems: a comparative analysis of SMS and NFC payments. *Econ.Res. Ekonomska istraživanja*, 30 (1), 892–910.
133. Liébana-Cabanillas, F., & Rubio J. L. (2017). Predictive and explanatory modeling regarding adoption of mobile payment systems. *Technological Forecasting & Social Change*, 120, 32-40.
134. Liébana-Cabanillas, F., Sanchez-Fernandez, J., & Munoz-Leiva, F. (2014). Role of gender on acceptance of mobile payment. *Ind. Manag. Data Syst.* 114 (2), 220–240.
135. Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). Antecedents of the adoption of the new mobile payment systems: The moderating effect of age. *Computers in Human Behavior*, 35(1), 464–478.
136. Lin, C., & Nguyen, C. (2011). Exploring e-payment Adoption in Vietnam and Taiwan. *Journal of Computer Information System*, 51(4), 41-52.

137. Lonare, A., Yadav, A., & Sindhu, S. (2018). E-Wallets: Diffusion and Adoption in Indian Economy. *Indian Journal of Commerce & Management Studies*, 9(2), 9-16.
138. Lu, Y., Yang, S., Chau, P., & Cao, Y. (2011). Dynamics between the trust transfer process and intention to use mobile payment services: A cross-environment perspective. *Information & Management*, 48(8), 393-403.
139. Lubrano, S. P. (2010). Mobile Payments: Moving Towards a Wallet in the Cloud? *Communications & strategies*, 79(3), 63-71.
140. Luna, I.R., Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2019). Mobile payment is not all the same: The adoption of mobile payment systems depending on the technology applied. *Technological Forecasting & Social Change*, 146, 931-944.
141. Luna, I.R., Montoro-Ríos, F., & Liébana-Cabanillas, F. (2016). Determinants of the intention to use NFC technology as a payment system: An acceptance model approach. *Information Systems and e-Business Management*, 14(2), 293-314.
142. Malhotra, P., & Singh, B. (2010). An analysis of Internet banking offerings and its determinants in India. *Internet Research*, 20(1), 87 – 106.
143. Mallat, N. (2007). Exploring consumer adoption of mobile payments: A qualitative study. *The Journal of Strategic Information Systems*, 16 (4), 413–432.

144. Makame, W.H., Kang J., & Park, S. (2014). Factors influencing electronic commerce adoption in developing countries: The case of Tanzania. *South African Journal of Business Management*, 45(2), 83-96.
145. Manikandan, M., & Chandramohan, S. (2015). Mobile Wallet- A Virtual Physical Wallet to the Consumers. *Paripex - Indian Journal of Research*, 4(9), 146-147.
146. Martins, C., Oliveira, T., & Popović, A. (2014). Understanding the internet banking adoption: a unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, 34(1), 1-13.
147. Mattila, M., Karjaluoto, H., & Pento, T. (2003). Internet Banking Adoption Among Mature Consumers: Early Majority Or Laggards? *Journal of Services Marketing*, 17(5), 514 – 528.
148. Mbogo, M. (2010). The impact of mobile payments on the success and growth of micro-business: The case of M-Pesa in Kenya. *The Journal of Language, Technology and Entrepreneurship in Africa*, 2(1). 180-203.
149. Mondego, D., & Gide, E. (2018). The Effect of Trust on Mobile Payment Adoption: A Comprehensive Review of Literature. *International Journal of Arts & Sciences*, 11(1), 375–390.
150. Monsuwe, T.P., Dellaert, B. G .C., & Ruyter, K. (2004). What drives consumers to shop online? A literature review. *International Journal of Service Industry Management*, 15(1), 102-121.
151. Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information

- technology innovation. *Information systems research*, 2(3), 192-222.
152. Mu, H., & Lee, Y. (2017). Examining the Influencing Factors of Third-Party Mobile Payment Adoption: A Comparative Study of Alipay and WeChat Pay. *The Journal of Information Systems*, 26(4), 247-284.
  153. Muthure, M.P., Ofafa, G.A., Stephen, M.A.M., & Muli, J. (2013). An Emprical Investigation on The Relationship Between Technological Infrastructure and Government Regulations on Effective Operations of M-Payment Systems in Kenya. *International Journal of Arts and Commerce*, 2(1), 186-196.
  154. Nguyen, T.N., Cao, T. K., Dang, P. L., & Nguyen, H. A. (2016). Predicting Consumer Intention to Use Mobile Payment Services: Empirical Evidence from Vietnam. *International Journal of Marketing Studies*, 8(1), 117-124.
  155. Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2016). Mobile payment: Understanding the determinants of consumer adoption and intention to recommend the technology. *Computers in Human Behavior*, 61, 404-414.
  156. Omotayo, F., & Dahunsi, O. (2015). Factors Affecting Adoption of Point of Sale Terminals by Business Organisations in Nigeria. *International Journal of Academic Research in Business and Social Sciences*, 5(10), 115-136.
  157. Ondrus, J., & Pigneur, Y. (2006). Towards a holistic analysis of mobile payments: A multiple perspectives approach. *Electronic Commerce Research and Applications*, 5(3), 246-257.

158. Ondrus, J., & Pigneur, Y. (2009). Near Field Communication: An Assessment for Future Payment Systems. *Information Systems and E-Business Management*, 7(3), 347-361.
159. Otieno, E.O., & Kahonge, A.M.(2014). Adoption of Mobile Payments in Kenyan Businesses: A Case Study of Small and Medium Enterprises (SME) in Kenya. *International Journal of Computer Applications*, 107(7) , 5-12.
160. Ouma, S.A., Odongo, T.M., & Were, M. (2017). Mobile financial services and financial inclusion: Is it a boon for saving mobilization? *Review of Development Finance*, 7(1), 29-35.
161. Ozili, P.K. (2017). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review*, 18(4), 329-340.
162. Padashetty, S., & Kishore S. V. K. (2013). An Empirical Study on Consumer Adoption of Mobile Payments In Bangalore City – A Case Study. *International Refereed Research Journal*, 4(1), 83-94.
163. Pal, A., De, R., Herath, T., & Rao, H. R. (2019). A Review of Contextual Factors Affecting Mobile Payment Adoption and Use. *Journal of Banking and Financial Technology*, 3(1), 43-57.
164. Park, J., Yang, S., & Lehto, X. (2007). Adoption of Mobile Technologies for Chinese Consumers. *Journal of Electronic Commerce Research*, 8(3), 196-206.
165. Peng, R., Xiong, L., & Yang, Z. (2012). Exploring tourist adoption of tourism mobile payment: An empirical analysis. *Journal of theoretical and applied electronic commerce research*, 7(1), 21-33.

166. Penttilä, M., Siira, E., & Tihinen, M. (2016). Mobile Payment Ecosystems in Transition. *International journal of scientific and technical research in engineering*, 1(6), 1-15.
167. Petrova, K., & Wang, B. (2013). Retailer Adoption of Mobile Payment: A Qualitative Study. *Journal of Electronic Commerce in Organizations*, 11(4), 70-89.
168. Phonthanakitithaworn, C., Sellitto, C., & Fong, M.W. (2014). User intentions to adopt mobile payment services: a study of early adopters in Thailand. *Journal of Internet Banking and Commerce*, 20(1), 1-29.
169. Phonthanakitithaworn, C., Sellitto, C., & Fong, M. W. L. (2016). A Comparative Study of Current and Potential Users of Mobile Payment Services. *SAGE Open*, 6(4) 1– 14.
170. Pinchot, J. L., Mishra, S., Paullet, K. L., & Kohun, F. G. (2016). Exploring Barriers To Adoption Of Mobile Payments For University Students: Lack Of Awareness, Lack Of Availability, And Perceived Security Risks. *Issues In Information Systems*, 17(3), 20-30.
171. Podile, V., & Rajesh, P. (2017). Public Perception on Cashless Transactions in India. *Asian Journal of Research in Banking and Finance*, 7(7), 63-77.
172. Pousttchi, K., Schiessler, M., & Wiedemann, D. G. (2009). Proposing a comprehensive framework for analysis and engineering of mobile payment business models. *Information Systems and e-Business Management*, 7(3), 363-393.



173. Raina, V.K. (2014). Overview of Mobile Payment: Technologies and Security. *IGI Global*, Chapter 11, 186-222.
174. Vohra, N., & Hazra, K. (2018). The state of e-wallets and digital payments in India 2018. *Regalix Research*.
175. Routray, S., Khurana, R., Payal, R., & Gupta, R. (2019). A Move towards Cashless Economy: A Case of Continuous Usage of Mobile Wallets in India. *Theoretical Economics Letters*, 9(4), 1152-1166.
176. Roy, S., & Sinha, I. (2014). Determinants of Consumers' Acceptance of Electronic Payment System in Indian Banking Sector – A Study. *International Journal of Scientific & Engineering Research*, 5(1), 177-187.
177. Roy, S., & Sinha, I. (2017). Factors affecting Consumers' adoption of Electronic Payment: an Empirical Analysis. *IOSR Journal of Business and Management*, 19(12), 76-90.
178. Roy, S. (2017). Factors Affecting Customers' Adoption Of Electronic Payment: An Empirical Analysis. *International Journal of Multidisciplinary Research & Advances In Engineering*, 9(3), 71-81.
179. Ruangkanjanases, A., & Wongprasopchai, S.(2017). Adoption of Mobile Banking Services: An Empirical Examination between Gen Y and Gen Z in Thailand. *Journal of Telecommunication, Electronic and Computer Engineering*, 9(3-5), 197-202.
180. Sarvepalli, S. K. K., & Prakash, N. R. M. (2016). A Study on the Scope of the Virtual Wallets in Indian Market -Issues and

Challenges. *International Journal Of Multifaceted And Multilingual Studies*, 3(8), 1-10.

181. Sarwar, M., & Soomro, T. R. (2013). Impact of Smartphone's on Society. *European Journal of Scientific Research*, 98(2), 216-226.
182. Sauermann, H., & Roach, M. (2013). Increasing web survey response rates in innovation research: An experimental study of static and dynamic contact design features. *Research Policy*, 42(1), 273-286.
183. Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, 9(3), 209-216.
184. Shaikh, A., & Karjaluoto, H. (2015). Mobile banking adoption: A literature review. *Telematics and Informatics*, 32 (1), 129-142.
185. Shankar, A., & Kumari, P. (2016). Factors Affecting Mobile Banking Adoption Behavior in India. *Journal of Internet Banking and Commerce*, 21(1), 1-24.
186. Shankar, V., Venkatesh, A., Hofacker, C., & Naik, P. (2010). Mobile Marketing in the Retailing Environment: Current Insights and Future Research Avenues. *Journal of Interactive Marketing*, 24(2), 111-120.
187. Shaouf, A., & Altaqqi, O. (2018). The Impact of Gender Differences on Adoption of Information Technology and Related Responses: A Review. *International Journal of Management and Applied Research*, 5(1), 22-41.

188. Shaw, N. (2014). The mediating influence of trust in the adoption of mobile wallet. *Journal of Retailing & Consumer Services*, 21(4), 449-459.
189. Shin, S., Lee, W. & Odom, D. (2014). A Comparative Study Of Smartphone User's Perception And Preference Towards Mobile Payment Methods In The U.S. And Korea. *The Journal of Applied Business Research*, 30(5). 1365-1376.
190. Shin, D.-H. (2010). Modeling the Interaction of Users and Mobile Payment System: Conceptual Framework. *International Journal of Human-Computer Interaction* 26 (10), 917–940.
191. Shukla, U. N. (2017). An Empirical Study on Future of Mobile - Wallets in India : A Gateway for Cashless Payments. *Arthshastra Indian Journal of Economics & Research*, 6 (6), 51-62.
192. Sikdar, P., & Makkad, M. (2015). Online banking adoption A factor validation and satisfaction causation study in the context of Indian banking customers. *International Journal of Bank Marketing*, 33 (6), 760-785.
193. Singh, N., Srivastava, S. & Sinha, N. (2017). Consumer preference and satisfaction of Mswallets: a study on North Indian consumers. *International Journal of Bank Marketing*, 35 (6), 944-965.
194. Sinha, I. (2016). Mobile Wallet service Utilisation in India: emperical analysis of user trust and acceptance factors. *International Journal of Scientific & Engineering Research*, 7(4), 1762-1771.

195. Sinha, M., Majra, H., Hutchins, J. & Saxena, R. (2018). Mobile payments in India: the privacy factor. *International Journal of Bank Marketing*, 37(1), 192-209.
196. Singh, S., & Islam, J. (2015). Emergence of M-commerce in India. *Advances in Economics and Business Management*, 2(5), 529-533
197. Slade, E.L., Williams, M.D., & Dwivedi, Y.K. (2013). Mobile payment adoption: Classification and review of the extant literature. *The Marketing Review*, 13(2), 167-190
198. Slade, E.L., Dwivedi, Y.K., Piercy, N.C., & Williams, M.D. (2015). Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: extending UTAUT with innovativeness, risk, and trust. *Psychol. Market.* 32 (8), 860–873.
199. Slade, E., Williams, M. D., Dwivedi, Y., & Piercy, N. (2015). Exploring consumer adoption of proximity mobile payments. *Journal of Strategic Marketing*, 23(3), 209-223.
200. Sumathy, M., & Vipin, K.P. (2017). Digital Payment Systems: Perception and Concerns among Urban Consumers. *Journal of Applied Research*, 3(6), 1118-1122.
201. Sunny, P., & George, A. (2018). Determinants of Behavioral Intention To Use Mobile Wallets – A Conceptual Model. *Journal of Management*, 5(5), 52-62.
202. Suhas, M.S., Abhilash, C.B., Vikas, K.C., & Pareek, A. (2014). Biometric Electronic Wallet For Digital Currency. *International*

*Journal of Research in Engineering and Technology*, 3(5), 276-283.

203. Sokobe, E. O.(2015).Factors Influencing Adoption of Electronic Payment by Small and Medium Hotel Enterprises in Kisii Town, Kisii County, Kenya. *International Journal of Novel Research in Computer Science and Software Engineering*, 2(2), 5-18.
204. Tam, C., & Oliveira, T. (2017). Literature review of mobile banking and individual performance.*International Journal of Bank Marketing*, 35(7), 1042-1065.
205. Tarasewich, P., Nickerson, R.C., & Warkentin, M. (2002). Issues in Mobile E-Commerce. *Communications of the Association for Information Systems*, 8 (1), 41-64.
206. Tawade, P.H. (2017). Future And Scope Of Cashless Economy In India. *IJARHIE*, 2(3), 177- 181.
207. Teng, P. K., Ling, T. J., & Seng, K.W. K. (2018). Understanding Consumer Intention to Use Mobile Payment Services in Nanjing, China. *International Journal of Community Development & Management Studies*, 2(1), 49-60.
208. Thakur, R. (2013). Customer adoption of mobile payment services by professionals across two cities in India: An empirical study using modified technology acceptance model. *Business Perspectives and Research*, 1(2), 17-29.
209. Thakur, R., & Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across consumer groups for mobile payment services in India. *Internet Research*, 24(3), 369-392.

210. Ting, H., Yacob, Y., Liew, L., & Lau, W.M. (2016). Intention to Use Mobile Payment System: A Case of Developing Market by City. *Procedia - Social and Behavioral Sciences*, 224(1), 368 – 375.
211. Tobbin, P., & Kuwornu, J.K. (2011). Adoption of Mobile Money Transfer Technology: Structural Equation Modeling Approach. *European Journal of Business and Management*, 3(7), 59–77.
212. Tossy, T. (2014). Modelling the Adoption of Mobile Payment System for Primary and Secondary School Student Examination Fees in Developing Countries: Tanzanian Experience. *International Journal of Information Technology and Business Management*, 27(1), 1-12.
213. Tornatzky, L. G., & Klein, K. J. (1982). Innovation characteristics and innovation adoption-implementation: A meta-analysis of findings. *IEEE Transactions on engineering management*, 29(1), 28-45.
214. Tripathi, P., & Nanda, N. (2017). Impact of De-Monetization on Consumers of Delhi/ NCR. *International Journal Of Economics & Finance Research & Applications*, 1(1), 16-24.
215. Vallespín, M., Molinillo, S., & Ramos, C. M. Q. (2018). Who relies on mobile payment systems when they are on vacation? A segmentation analysis. *Tourism*, 66(1), 6 – 18.
216. Van der Heijden, H. (2003). User Acceptance of Hedonic Information Systems. *MIS Quarterly*, 28(4), 695-704.

217. Vanisree, D. (2013). Mobile Banking in India: Barriers in Adoption and Service Preferences. *Paripex - Indian Journal of Research*, 2 (7), 180-183.
218. Vally, K.S., & Divya, K.H. (2018). A Study on Digital Payments in India with Perspective of Consumer's Adoption. *International Journal of Pure and Applied Mathematics*, 119(15), 1259-1267.
219. Vasantha, S. & P. Sarika, P. (2019). Empirical Analysis of Demographic Factors Affecting Intention to use Mobile Wallet. *International Journal of Engineering and Advanced Technology*, 8(6), 768-776.
220. Venkatesh, V., & Morris, M. G. (2000). Why Don't Men Ever Stop to Ask for Directions? Gender, Social Influence and Their Role in Technology Acceptance and Usage Behaviour. *MIS Quarterly*, 24(1), 115–139.
221. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Towards a unified view. *MIS Quarterly*, 27(3), 425–478.
222. Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273–315.
223. Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly*, 36(1), 157-178.
224. Vidyashree, D.V., Harshitha, J.S., & Darshini, A. (2018). A Study On People's Attitude Towards Digital Money. *International*

*Journal of Computer Engineering and Applications*, 12(special issue), 1-9.

225. Vikas, D., & Kumar, A.A. (2018). What Indians Think About Paytm. *World Scientific News*, 110, 184-196.

226. Wang, H.M., & Idertsog, B. (2015). A Study on User's Intention of Using Mobile Payments. *International Journal of Sciences: Basic and Applied Research*, 24(6), 433-449.

227. Wang, L. & Yi, Y. (2012). The impact of use context on mobile payment acceptance: An empirical study in China', in Xie, A. & Huang, X. (eds), *Advances in computer science and education*, 293-300.

228. Wani, T.A., & Ali, S. W. (2015). Review & Scope in the Study of Adoption of Smartphones in India. *Journal of General Management Research*, 3(2), 101–118.

229. Wasiq, M., Ahmad, N., & Burney, M.T. (2016). Future of M-Commerce Services in India. *International Journal of Marketing & Financial Management*, 4(5), 1- 10.

230. Widjaja, N. D., & Tedjawidjaja, A. (2012). A Preliminary Study of Merchants' Intention to Adopt Online Payment Gateway in Indonesia. *International Journal of Future Computer and Communication*, 1(2), 155-159.

231. Wood, S.L. (2002). Future fantasies: A social change perspective of retailing in the 21st century. *Journal of Retailing*, 78(1), 77–83.



232. Wu, J., & Wang, S. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*, 42(5), 719-729.
233. Xu, H., Teo, H. H., Tan, B. C. Y., & Agarwal, R. (2010). The role of push-pull technology in privacy calculus: the case of location-based services. *Journal of Management Information Systems*, 26(3), 137–176.
234. Yadav, R., Chauhan, V., & Pathak, G.S. (2015). Intention to adopt internet banking in an emerging economy: a perspective of Indian youth. *International Journal of Bank Marketing*, 33(4), 530 – 544.
235. Yang, S., Lu, Y., Gupta, S., Cao, Y., & Zhang, R. (2012). Mobile payment services adoption across time: An empirical study of the effects of behavioral beliefs, social influences, and personal traits. *Computers in Human Behaviour*, 28(1), 129-142.
236. Yang, K. (2012). Consumer technology traits in determining mobile shopping adoption: An application of the extended theory of planned behavior. *Journal of Retailing and Consumer Services*, 19(5), 484–491.
237. Yang, Y., Liu, Y., Li, H., & Yu, B. (2015). Understanding perceived risks in mobile payment acceptance. *Industrial Management & Data Systems*, 115(2), 253-269.
238. Yu, L., Cao, X., Liu, Z., Gong, M., & Adeel, L. (2018). Understanding mobile payment users' continuance intention: a trust transfer perspective. *Internet Research*, 28(2), 456-476.

239. Zailinawati, A. H., Schattner, P., & Mazza, D. (2006), Doing a pilot study: why is it essential? *Malaysian Family Physician*, 1(2&3), 70-73.
240. Zhang, Y., Sun, J., Yang, Z., & Wang, Y. (2018). What Makes People Actually Embrace or Shun Mobile Payment: A Cross-Culture Study. *Mobile Information Systems*, Article ID.
241. Zhou, T. (2014). Understanding the determinants of mobile payment continuance usage. *Industrial Management & Data Systems*, 114(6), 936-948.
242. Zhu, H.D., Lan, Y.L., & Chang, Y.P. (2017). Understanding the Intention to Continue Use of a Mobile Payment Provider: An Examination of Alipay Wallet in China. *International Journal of Business and Information*, 12(4), 369-390.

## Websites

1. Aite. (2017). *Global Consumer Survey: Consumer Trust and Security Perceptions*. Aciworldwide. <https://www.aciworldwide.com/-/media/files/collateral/trends/2017-global-consumer-survey-consumer-trust-and-security-perceptions.pdf>.
2. Anand, N., (2018). *Nearly half of Indian bank accounts are rarely used*. Quartz India. <https://qz.com/india/1260139/india-has-the-highest-number-of-inactive-bank-accounts-in-the-world/>
3. Apple. (2017). *Feature-availability*. Apple. <http://www.apple.com/es/ios/feature-availability/#apple-pay>

4. Batchelor, S. (2007). Sending Money outside the Envelope, One World A Million Stories. Developments. <http://www.developments.org.uk/articles/loose-talk-saves-lives> Current: January 1, 2008.
5. Bhattacharya, A. (2018). Apps Trump Websites for Indian Smartphone Users. <https://qz.com/1221380/flipkart-once-went-app-only-and-shuttered-its-mobile-site-a-move-ahead-of-its-time/>
6. Cellan-Jones, R. (2012). Mobile money - has its moment come? *BBC News: Technology*. <http://www.bbc.co.uk/news/technology-17057570>
7. CII Report. (2016). *E-commerce in India – A Game Changer for the Economy*. <http://italiaindia.com/images/uploads/pdf/april-2016-e-commerce-in-india.pdf>
8. Códigos-qr.com. (2016). *QR Codes*. Códigos QR. <http://www.codigos-qr.com/>
9. David E. Acosta, (2019). *Mobile payments with digital wallets and tokenization. How Google Pay, Apple Pay and Samsung Pay protect your card details*. Advantio. [https://www.advantio.com/hs/fs/hubfs/AdvantioBlog\\_May\\_David\\_Diagram2\\_ENGLISH.png?width=754&name=AdvantioBlog\\_May\\_David\\_Diagram2\\_ENGLISH.png](https://www.advantio.com/hs/fs/hubfs/AdvantioBlog_May_David_Diagram2_ENGLISH.png?width=754&name=AdvantioBlog_May_David_Diagram2_ENGLISH.png)
10. Devere (2019). *Cashless is king in India: digital transactions growing faster than anywhere else*. <https://www.devere-vault.com/blog/Cashless-is-king-in-India-digital-transactions-grow-faster-than-anywhere-else>.

11. Digital marketing. (2019). *The Power of Internet: Internet Penetration in India*. E market education. <https://www.emarketeducation.in/power-internet-penetration-online-india/>
  
12. ETCIO, 2017. EconomicTimes. *Internet users in India to double by 2021: Cisco VNI*. <https://cio.economictimes.indiatimes.com/news/internet/internet-users-in-india-to-double-by-2021-cisco-vni/59066697>
  
13. Economic Times. (2019). *No MDR charges applicable on payment via RuPay, UPI from Jan 1: Sitharaman*. Economic Times. [https://economictimes.indiatimes.com/industry/banking/finance/banking/no-mdr-charges-applicable-on-payment-via-rupay-upi-from-jan-1-sitharaman/articleshow/73008967.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](https://economictimes.indiatimes.com/industry/banking/finance/banking/no-mdr-charges-applicable-on-payment-via-rupay-upi-from-jan-1-sitharaman/articleshow/73008967.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)
  
14. Enterprenuer staff. 2020. *How M-commerce is Changing the Landscape of E-commerce in India*. Entrepreneur. <https://www.entrepreneur.com/article/346340>
  
15. ET online. (2019). *Indian millennials addicted to smartphones, spend one-third of their waking hours on WhatsApp, FB*. Economic times. <https://economictimes.indiatimes.com/magazines/panache/indian-millennials-addicted-to-smartphones-spend-one-third-of-their-waking-hours-on-whatsapp-fb/articleshow/72902910.cms?from=mdr>
  
16. European Commission. (2012). *Green Paper: Towards an integrated European market for card, internet and mobile payments*. Eurlex.europa. <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:>

17. European Payment Council. (2014). *Overview of mobile payment initiatives.* European payments council.  
<http://www.europeanpaymentscouncil.eu/index.cfm/knowledge-bank/epc-documents/epc-overview-on-mobile-payments-initiatives-edition-december-2014/epc091-14-v20-epc-overview-on-mobile-payments-initiatives/>
  
18. Forrest, S. (2020). *Study examines India's policies for financial inclusion of the unbanked.* News Illinois.  
<https://news.illinois.edu/view/6367/808477>.
  
19. Gemalto. (2016). *Gemalto Contactless wearable wins Juniper Research Future Digital Award.* Hugin.  
<http://hugin.info/159293/R/2045150/763901.pdf> 117
  
20. Gemalto. (2016). *Rio de Janeiro launches Gemalto contactless transport ticketing wristband Amsterdam.* Gemalto.  
<http://www.gemalto.com/press/Pages/Rio-de-Janeiro-launches-Gemalto-contactless-transport-ticketing-wristband.aspx>
  
21. Gent, E., (2019). Will India's payments ever be fully mobile? Raconteur. <https://www.raconteur.net/finance/mobile-payments-systems-india>.
  
22. Grant Thornton (2020). Financial inclusion in rural India: Banking and ATM sector in India. [https://vakrangee.in/pdf/reports\\_hub/financial-inclusion-in-rural-india-28-jan.pdf](https://vakrangee.in/pdf/reports_hub/financial-inclusion-in-rural-india-28-jan.pdf)
  
23. Gupta, A., & Auerswald, P.E. (2019). *The Ups and Downs of India's Digital Transformation.* Harvard Business Review.

- <https://hbr.org/2019/05/the-ups-and-downs-of-indias-digital-transformation>.
24. Han, J., (2019). *India Time Spent with Media 2019*. E marketer.  
<https://www.emarketer.com/content/india-time-spent-with-media-2019>
  25. India digital payment report, 2019. Worldline.  
<https://worldline.com/content/dam/worldline/documents/india/documents/worldline-india-digital-payments-report-2019-a-year-in-review.pdf>
  26. Internet World Stats. (2019).  
<https://www.internetworldstats.com/top20.htm>
  27. Matthews, T., Pierce, J., & Tang, J. (2009). No smart phone is an island: the impact of places, situations, and other devices on smart phone use. *IBM Research Report*, 1-10.  
[https://www.researchgate.net/publication/229041304\\_No\\_smart\\_phone\\_is\\_an\\_island\\_the\\_impact\\_of\\_places\\_situations\\_and\\_other\\_devices\\_on\\_smart\\_phone\\_use](https://www.researchgate.net/publication/229041304_No_smart_phone_is_an_island_the_impact_of_places_situations_and_other_devices_on_smart_phone_use)
  28. Mishra, C., (2019). *Top 6 Ways of Cashless Payments*. Upi payments.  
<https://upipayments.co.in/digital-payment/>
  29. Nariyanuri, S.S. (2020). *India Mobile Payments Market Report*.  
[spglobal.com/marketintelligence](https://spglobal.com/marketintelligence).
  30. Porteous, D. (2006). *The Enabling Environment for Mobile Banking in Africa, Bankable Frontier, commissioned by the Department for International Development*. Bankable Frontier.  
<http://www.bankablefrontier.com/assets/ee.mobil.banking.report.v3.1.pdf>

31. Prabhudesai, A., (2014). *Indian Telecom Growth Story: From 10M to 900M Subscribers In 10Yrs.* Trak.in.  
<https://trak.in/tags/business/2007/06/19/indian-telecommunication-story-from-10-million-to-150-million-mobile-subscribers-in-5-years/>
32. PTI. (2018). *Aadhaar covers over 89% population: Alphons.* Times of India. <https://timesofindia.indiatimes.com/business/india-business/aadhaar-covers-over-89-population-alphons/articleshow/63202223.cms>
33. Pymnts. (2019). *WhatsApp Mobile Payments Secure 210M Users In India.* Pymnts. <https://www.pymnts.com/news/mobile-payments/2019/whatsapp-pay-india-regulators/>
34. PTI, (2019). *Internet users in India to reach 627 million in 2019: Report.* Economic Times. <https://economictimes.indiatimes.com/tech/internet/internet-users-in-india-to-reach-627-million-in-2019-report/articleshow/68288868.cms>
35. PTI. (2019). *Currency in circulation as percentage of GDP declines since DeMo: FinMin official.* Economic Times. <https://economictimes.indiatimes.com/news/economy/finance/currency-in-circulation-as-percentage-of-gdp-declines-since-demo-finmin-official/articleshow/68598744.cms>
36. Ramani, K. (2020). *Top 10 Mobile Wallets In India – 2020 Edition.* Social Beat. <https://www.socialbeat.in/blog/top-10-mobile-wallets-in-india/>
37. RBI. [https://www.rbi.org.in/scripts/BS\\_ViewBulletin.aspx](https://www.rbi.org.in/scripts/BS_ViewBulletin.aspx)

38. Samsung (2017). Samsung Pay. Samsung.  
<http://www.samsung.com/es/apps/mobile/galaxyapps/samsung-pay/>
39. Schaettgen, N., & Taga, K. (2010). *An acronym-free primer on mobile payments*. Adlittle.  
[http://adlittle.nl/uploads/tx\\_extprism/ADL\\_PRISM\\_2\\_2010\\_m-payment.pdf](http://adlittle.nl/uploads/tx_extprism/ADL_PRISM_2_2010_m-payment.pdf).
40. Sorensen, E. (2018). *Different types of mobile payments explained*. Mobile transaction. <https://www.mobiletransaction.org/different-types-of-mobile-payments/>
41. Surabhi, (2020). *Digital payments rise in COVID times, but then so does cash in circulation*. The Hindu Businessline <https://www.thehindubusinessline.com/economy/digital-payments-rise-in-COVID-times-but-then-so-does-cash-in-circulation/article32774031.ece>
42. The Hindu. (2018). *Digital push, going cashless will shrink shadow economy, boost GDP growth: Meghwal*. The Hindu business line. <https://www.thehindubusinessline.com/economy/digital-push-going-cashless-will-shrink-shadow-economy-boost-gdp-growth-meghwal/article9546750.ece>
43. TRAI.(2020).[https://main.trai.gov.in/sites/default/files/PR\\_No.17of2020.pdf](https://main.trai.gov.in/sites/default/files/PR_No.17of2020.pdf)
44. UK Payments Council. (2013). *The Way We Pay*. Payment council.org.  
[http://www.paymentscouncil.org.uk/files/payments\\_council/statistical\\_publications/the\\_way\\_we\\_pay\\_-\\_february\\_2013.pdf](http://www.paymentscouncil.org.uk/files/payments_council/statistical_publications/the_way_we_pay_-_february_2013.pdf)



45. UK Finance (2019) *UK Payments Markets 2019*, London: UK Finance.<https://www.retailresearch.org/mobile-retailing.html>
46. Varshney, R. (2020). *Paytm dominates merchant payments with a 50 pc market share: report.* Yourstory. <https://yourstory.com/2020/08/india-mobile-merchant-payments-gateway-paytm-redseer>
47. Viswanathan, P. (2018). *Lifewire: 8 Popular Mobile Payment Apps.* Lifewire. <https://www.lifewire.com/most-popular-mobile-payment-apps-2373179>
48. Webnotes. (2017). *History of Internet Growth in India.* Webnotes. <https://www.webnotes.com/history-of-internet-growth-in-india/>
49. Worldpay Inc, 2019. *Worldpay, Inc.: mCommerce to overtake desktop sales by 2020.* <https://www.prnewswire.com/in/news-releases/worldpay-inc-mcommerce-to-overtake-desktop-sales-by-2020-842009420.html>
50. Zee media bureau. (2019). *Indian m-commerce market to more than double over next 4 years, set to be worth \$54 bn.* Zeenews. <https://zeenews.india.com/technology/indian-m-commerce-market-to-more-than-double-over-next-4-years-set-to-be-worth-54-bn-2171001.html>

# **APPENDICES**

## MODEL BASED RESEARCH

**Table : Researches based on models**

<b>MODEL NAME</b>	<b>AUTHOR (S)</b>
TAM	Li et al. (2014); Lesa & Tembo (2016); Dennehy & Sammon (2015); Mbogo (2010); Wang & Idertsog (2015); Anthony & Mutalemwa (2014); Mallat et al. (2009); Schierz et al.(2010)
Extended TAM	Ashoka & Ramaprabha (2018); Kumar et al.(2017); Govender & Sihlali (2014); Pal et al. (2015); Shaw (2014); Wani & Ali (2015); Hamza and Shah (2014); Dahlberg et al. (2003); Kim et al. (2010); Phonthanukitithaworn et al. (2015); Phonthanukitithaworn et al. (2016)
TAM & IDT	Chen & Adams (2005);
TAM & TPB	Nguyen et al. (2016); Yadav et al (2014)
TAM & UTAUT	Sunny & George (2018)
TAM & TRA	Davis et al. (1989)
TDM & TOE	Otieno & Kahonge (2014)
UTAUT	Tossy (2014); Yeh & Tseng (2017); Widjaja & Tedjawidjaja (2012); Williams et al. (2015); Martin et al. (2014); Im et al. (2011);
Elaboration Likelihood Model (ELM)	Zhu, Lan & Chang (2017); Kim et al. (2016)
TRI model	Humbani & Wiese (2017)
TAM, TRA, TPB, & UTAUT	Aydin & Burnaz (2016)
TRA & TPB	Mu & Lee (2017)
Others	Amoroso (2010); Chandra et al. (2010)

**Table : Hypothesis formulation from existing literature**

<b>FACTORS</b>	<b>AUTHORS</b>
Perceived usefulness	Nguyen et al (2016); Kabata (2015); Padashetty & Kishore (2013); Yakubu (2012); Perera (2007); Peng et al (2012); Ahrenstedt et al (2015); Li et al (2014); Lesa & Tembo (2016); Mbogo (2010); Phonthanukitithaworn et al (2015); Luna et al (2017); Chandrasekhar (2017); Hamza & Shah (2014)
Perceived ease of use	Kabata (2015); Yakubu (2012); Dahlberg and Mallat (2002); Perera (2007); Peng et al (2012); Ahrenstedt et al (2015); Lesa & Tembo (2016); Mbogo (2010); Phonthanukitithaworn et al (2015); Hamza & Shah (2014); Ayodele et al (2013);
Social norms	Nguyen et al (2016); Kabata (2015); Tossy (2014); Ahrenstedt et al (2015); Li et al (2014); Lesa & Tembo (2016); Phonthanukitithaworn et al (2015); Yang et al (2012); Hamza & Shah (2014)
Application provider	Perera (2007); Chogo & Sedoyeka (2015);

**Table - Attributes of Mobile Payments**

<b>Attribute</b>	<b>Definition</b>	<b>Adapted from</b>
Accesibility	Accesibility means how easily people can access the product to be used or consumed	Jinkyung (2018)
Availability	Mobile payment is always available due to mobile network availability	Jinkyung (2018)
Compatibility	The degree to which innovation is perceived as consistent with the existing values, past experiences, and needs of	Rogers (2002); Mallat N. (2006)

	potential adopters.	
Complexity	The degree to which innovation is perceived as relatively difficult to understand and use.	Rogers (2002); Mallat N. (2006)
Cost/ economic	The new systems should be, in the end, more cost effective than the legacy approaches, e.g. the technology used may cost more but fraud is minimized, so ultimately it is a cost-saving solution.	Karnouskos and Fokus (2004); Mallat N. (2006); Van der Heijden (2002); Darren et al. (2013); Jinkyung (2018)
Cross-border payments	Any global mobile payment system should be able to handle cross-border payments in any currency and at any place and it should be possible to make cross-border payments almost as easily as local payments	Karnouskos and Fokus (2004)
Customer Data Control	Payment through mobile helps merchants with customers' data, which is beneficial in further promotions	Hayashi and Bradford (2014)
Customer Shopping Experience	Mobile payment will enhance customer's shopping experience providing immediate payment option	Hayashi and Bradford (2014)
Integration of legacy approaches	Existing channels, such as pre-/post accounts, credit card infrastructures, etc., should be supported, and the user should	Karnouskos and Fokus (2004)

	be free to choose the processing partner (e.g. bank, MNO, credit card) on a per transaction basis	
Interoperability / Scalability	MP component development should be based on standards and open technologies that will allow any system to interact with another system on a global scale at all levels (e.g. any mobile with any POS, any payment software should run on a wide range of mobiles etc.).	Karnouskos and Fokus (2004); Van der Hejden (2002)
Local market understanding	Approaches that wish to be sustainable must either improve their functionality and usability, or be creative in making users and merchants perceive it as beneficial. Furthermore, the same success criteria may not apply to every country due to local social conditions.	Karnouskos and Fokus (2004)
Merchant Acceptance	Merchant acceptance of mobile payment is important for customers willing to make mobile payment	Hayashi (2012)
Network externalities and creation of critical mass	Consumer decision to adopt a payment system is therefore significantly affected by the amount of other consumers and merchants using it. Failure in	Mallat N. (2006)

	creating critical mass has contributed to discontinuance of several previous payment systems	
Observability	The degree to which the results of an innovation are visible to others	Rogers (2002)
Security, trust and privacy/ secured	Giving access to a checking or savings account to a software company is not the same thing, in most users' minds, as giving that same access to an already trusted entity, such as a bank. Unless the basis for electronic payment systems is based on tried and true secure banking practices, it is unlikely that users will adopt it. For merchants they feel that mobile payments will help in reduction of fraud transactions at POS.	Dahlberg and Mallat (2002); Van der Heijden (2002); Karnouskos and Fokus (2004); Mallat N. (2006); Hayashi and Bradford (2014)
Simplicity and usability/ easy to use/ convinience	Simplicity and usability largely determine whether users will use a service. This includes not only a user-friendly interface, but also the whole range of goods and services one can purchase, the geographical availability of the service, and the level of risk the user is taking while using it	Karnouskos and Fokus (2004); Wilmos and Karnouskos (2004); Dahlberg and Mallat (2002); Hayashi (2012)

Speed	The new payment method should decrease transaction time, automate transactions	Karnouskos and Fokus (2004)
Trialability	The degree to which innovation may be experimented with on a limited basis.	Rogers (2002)
Universality (and flexibility)	e-/m-commerce favors the logic of on-line universal payment services, integrating, in a user-transparent fashion, person-to-person (P2P), business-to-consumer (B2C), and business-to-business (B2B), domestic, regional, and global coverage, low-value and high-value payments.	Karnouskos and Fokus (2004); Van der Heijden (2002)



## Consumer Questionnaire

Dear Respondent, I am Sonal, Research Scholar, pursuing PhD from ICFAI University Jharkhand on the topic “*Adoption and Usage of Mobile Payment Systems by Consumers and Merchants: a Comparative Study in Ranchi and Kolkata*”. I request your valuable time and cooperation for filling this questionnaire that will take about 10 minutes of your time. Your help is highly solicited to make the study meaningful. Your response will be kept confidential.

1. Gender :  
☐ Male ☐ Female
2. Age :  
☐ 15 to 25 yrs ☐ 41 to 60 yrs  
☐ 26 to 40 yrs ☐ 61 yrs and above
3. Educational qualification:  
☐ Below intermediate ☐ Post graduate or higher  
☐ +2/Intermediate  
☐ Graduate
4. Occupation :  
☐ Student ☐ Government employee  
☐ Businessman ☐ Private employee  
☐ Occupational (lawyer, doctor etc) ☐ Housewife  
☐ Unemployed
5. Your monthly income is:  
☐ Upto Rs. 10,000 ☐ Rs. 50,001- 1,00,000  
☐ Rs. 10,001-30,000 ☐ Above Rs. 1,00,001  
☐ Rs. 30,001- 50,000

6. When a new technology is introduced in the market :
- |  |   |
|--|---|
| <input type="checkbox"/> I am usually among the first to use | <input type="checkbox"/> I am among late users              |
| <input type="checkbox"/> I wait for others to use first      | <input type="checkbox"/> I prefer using old technology only |
7. A) Do you know you can make payment through your mobile:
- |                              |                             |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|
- B) **IF NO**, would you like to make such payment if you come to know that it is available in your city :
- |                              |                             |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|
8. Do you have any mobile payment application installed in your phone:
- |                              |                             |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|
9. Do you use mobile payment system:
- |                              |                             |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

**NON USERS ( I DON'T USE MPS) :-**

10. A) Why don't you use mobile payment system :
- |  |
|--|
| <input type="checkbox"/> I used to earlier, now abandoned              |
| <input type="checkbox"/> I don't know how to use mobile payment system |
| <input type="checkbox"/> I don't trust mobile payment system           |
| <input type="checkbox"/> I find it useless                             |
| <input type="checkbox"/> I am convenient with cash and card only       |
| <input type="checkbox"/> I am not convenient with smart phone          |
| <input type="checkbox"/> Others specify .....                          |
- B) **IF ABANDONED**, please tick the reason(s), for your such decision:
- |   |
|---|
| <input type="checkbox"/> Feel insecure        |
| <input type="checkbox"/> Complex process      |
| <input type="checkbox"/> Time taking          |
| <input type="checkbox"/> Find it useless      |
| <input type="checkbox"/> Others specify ..... |
11. Would you like to use the mobile payment system in future, if your issues are resolved:
- |                              |                             |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

**USERS ( I USE MPS):-**

12. Please rank the following method of payments in order of preference, on a scale of 1 to 5 where 1 is least preferred and 5 is most preferred :

Description	Your ranking from 1 to 5
Cash	
Debit card	

Credit card	
Net banking	
Mobile payment	

13. What mobile payment apps you use (please tick the apps you have in your phone):

- |  |  |
|--|--|
| <input type="checkbox"/> PayTm                           | <input type="checkbox"/> Paypal                |
| <input type="checkbox"/> Freecharge                      | <input type="checkbox"/> Tez                   |
| <input type="checkbox"/> PhonePe                         | <input type="checkbox"/> NFC                   |
| <input type="checkbox"/> BHIM                            | <input type="checkbox"/> WhatsApp payment app  |
| <input type="checkbox"/> Jio money                       | <input type="checkbox"/> Others (specify ..... |
| <input type="checkbox"/> Airtel money                    | <input type="checkbox"/> .....                 |
| <input type="checkbox"/> Bank specific app(specify ..... | <input type="checkbox"/> .....                 |
| <input type="checkbox"/> .....                           | <input type="checkbox"/> .....                 |

14. For how long have you been using mobile payment system:

- |                                  |  |
|----------------------------------|--|
| <input type="checkbox"/> 0-1 yr  | <input type="checkbox"/> 2-4 yrs         |
| <input type="checkbox"/> 1-2 yrs | <input type="checkbox"/> 4 yrs and above |

15. How often do you make mobile payment:

- |  |                                       |
|--|---------------------------------------|
| <input type="checkbox"/> Daily several times | <input type="checkbox"/> Weekly once  |
| <input type="checkbox"/> Daily once          | <input type="checkbox"/> Monthly once |

16. Monthly, how much do you spend on mobile payment:

- |   |  |
|---|--|
| <input type="checkbox"/> Below Rs.2,000   | <input type="checkbox"/> Rs. 5,001- 10,000 |
| <input type="checkbox"/> Rs. 2,001- 5,000 | <input type="checkbox"/> Above Rs. 10,001  |

17. For what kind of transaction(s) do you use mobile payment (you may tick more than one):

- |  |                                   |
|--|-----------------------------------|
| <input type="checkbox"/> Payment for utilities | <input type="checkbox"/> Shopping |
| <input type="checkbox"/> Entertainment         | <input type="checkbox"/> Others   |
| <input type="checkbox"/> Journey tickets       | specify.....                      |
| <input type="checkbox"/> Fund transfer         | .....                             |
| <input type="checkbox"/> Mobile recharge       |                                   |

18. Do you keep your mobile wallets loaded with balance anytime :

- |   |
|---|
| <input type="checkbox"/> Yes it is anytime loaded                                   |
| <input type="checkbox"/> No, I load exact sum to be paid at the time of transaction |
| <input type="checkbox"/> No, I load some extra amount than needed at that time      |

19. How do you agree with these statements

Strongly Disagree- 1, Disagree- 2, Neutral- 3, Agree- 4 and Strongly Agree- 5

S.No.	Description	1	2	3	4	5
1	I use mobile payment because I find it very useful					
2	I use mobile payment because it makes my payment quick					
3	I use mobile payment because I can use it from					

	anywhere at anytime					
4	I use mobile payment because it helps me to keep track of my day to day expense					
5	I use mobile payment because it eases my transaction while shopping online or booking tickets					
6	I use mobile payment because easy to use					
7	I use mobile payment because I may not carry wallet, but I carry my mobile everywhere					
8	I use mobile payment because it is compatible with my lifestyle					
9	I use mobile payment because it was easy for me to learn its process					
10	I use mobile payment because it was easy for me to become skilful in using it					
11	I use mobile payment because I think it will add to my image in my community					
12	I encourage my family and friends to use mobile payment					
13	I use mobile payment because people important to me use it					
14	I use mobile payment after seeing that it has made life of my family and friends easier					
15	I use mobile payment to support cashless India					
16	I use mobile payment to help in curbing black money					
17	I have started using MPS after demonetisation					
18	I prefer to use mobile payment launched by the government					
19	I use mobile payment because I trust my app provider					
20	I use MPS because cashbacks are given					
21	I want cross wallet transfer feature in MPS					
22	I am concerned about my refund in case of transaction failure					
23	I trust my app provider because of good reviews in mass/social media					
24	I will continue using mobile payment in future					

20. While using mobile payment, do you feel your financial data is at risk:

☐ Yes

☐ No

21. Do you feel merchant will misuse your credentials while payment

☐ Yes

☐ No

22. Do you feel merchant don't encourage mobile payment

☐ Yes

☐ No

23. How many merchants out of 100, accept payment through mobile?

.....

24. What do you feel about your city in aspect of MPS?

Strongly Disagree- 1, Disagree- 2, Neutral- 3, Agree- 4 and Strongly Agree- 5

S.No.	Description	1	2	3	4	5
-------	-------------	---	---	---	---	---

1	I feel there is less awareness about MPS in my city					
2	I feel mobile payment is not accepted everywhere in my city					
3	I feel merchant has less digital literacy					
4	I feel mobile payment is new trend in my city					
5	I find wide acceptance of mobile payment, a distant dream for my city					

25. What problems do you encounter while using MPS (you may choose more than one):

- |  |   |
|--|---|
| <input type="checkbox"/> Transaction failure | <input type="checkbox"/> Wide acceptance  |
| <input type="checkbox"/> Monthly limitation  | <input type="checkbox"/> Digital literacy |
| <input type="checkbox"/> Network failure     | <input type="checkbox"/> Others .....     |
| <input type="checkbox"/> Merchant discourage |   |

26. Will you continue using mobile payment:

- ☐ Yes ☐ No

27. Any suggestions you want to give for improvement of MPS.

.....  
.....

**Personal information(optional)**

28. Your name .....

29. Phone number .....

## Merchant Questionnaire

Dear Respondent, I am Sonal, Research Scholar, pursuing PhD from ICFAI University Jharkhand on the topic “*Adoption and Usage of Mobile Payment Systems by Consumers and Merchants: a Comparative Study in Ranchi and Kolkata*”. I request your valuable time and cooperation for filling this questionnaire that will take about 10 minutes of your time. Your help is highly solicited to make the study meaningful. Your response will be kept confidential.

1. Gender :  
☐ Male ☐ Female
2. Age :  
☐ 15 to 25 yrs ☐ 41 to 60 yrs  
☐ 26 to 40 yrs ☐ 61 yrs and above
3. Educational qualification:  
☐ Below intermediate ☐ Post graduate or higher  
☐ +2/Intermediate  
☐ Graduate
4. When a new technology is introduced in the market :  
☐ I am usually among the first to use ☐ I am among late users  
☐ I wait for others to use first ☐ I prefer using old technology only
5. Do you keep your business updated with latest technology  
☐ Yes ☐ No
6. Do you know about Mobile Payment System  
☐ Yes ☐ No
7. Do you have any Mobile Payment app in your phone  
☐ Yes ☐ No
8. Do you accept payment through Mobile Payment System :  
☐ Yes , using  
☐ No, never used  
☐ Earlier used to, now abandoned

### NON USERS (I DON'T ACCEPT MOBILE PAYMENT) :-

9. Why don't you accept mobile payment:  
☐ Haven't heard of MPS  
☐ Cost involved to use MPS  
☐ Not comfortable with mobile payment process  
☐ Comfortable with cash mode only  
☐ No consumer demand  
☐ No lucrative offer from service providers  
☐ Not comfortable with smartphone

- ☐ Not compatible with my nature of business
- ☐ Others please specify .....

10. When you don't accept mobile payment, what percent consumers demand for this payment option:

- ☐ 1-5%
- ☐ 6-10%
- ☐ 11-15%
- ☐ More than 15%

---

**ABANDONED (I USED TO ACCEPT MOBILE PAYMENT, NOW ABANDONED) :-**

11. What is reason for abandonment (you may tick more than one option):

- ☐ Extra charges
- ☐ Problem faced in using
- ☐ Consumers not paying through MPS
- ☐ Not compatible with my business model
- ☐ No lucrative offer from service providers
- ☐ Others please specify .....

---

**USERS( I ACCEPT MOBILE PAYMENT) :-**

12. Please rank the following methods of payment in order of preference of acceptance, on a scale of 1 to 5 where 1 is least preferred and 5 is most preferred :

Description	Your ranking from 1 to 5
Cash	
Debit / Credit card	
Net banking	
Mobile payment	
Others specify .....	

13. What mobile payment modes you have installed:

- ☐ PayTm
- ☐ Freecharge
- ☐ PhonePe
- ☐ Jio Money
- ☐ Airtel Money
- ☐ Bank specific app(specify .....
- ☐ ..)
- ☐ Tez
- ☐ PayPal
- ☐ BHIM
- ☐ MobiKwik
- ☐ NFC
- ☐ I have my own app
- ☐ Others please specify .....
- ☐ ...

14. For what purpose/s do you use mobile payment (you may tick more than one option):

- ☐ Sales transaction
- ☐ Purchasing stock
- ☐ Payment to vendors

- ☐ Purchasing of services
- ☐ Paying insurance premium
- ☐ Payment of electricity bills etc

15. What percent of your total monthly sales come through mobile payment:

- ☐ Less than 5%
- ☐ 6-10%
- ☐ 11-15%
- ☐ 16-20%
- ☐ More than 20%

16. Out of 100, how many consumers demand for mobile payment option

.....

17. Do you encourage consumer to pay through MPS

- ☐ Yes
- ☐ No

18. How do you agree with these statements

Strongly Disagree- 1, Disagree- 2, Neutral- 3, Agree- 4 and Strongly Agree- 5

Why do you accept mobile payment?

S.No.	Description	1	2	3	4	5
1	I accept mobile payment to keep out of change issue					
2	The problem of accepting card in case of small penny transaction is now resolved by mobile payment					
3	I accept mobile payment because it has reduced time in processing payment					
4	I use mobile payment as it has made money transfer very easy					
5	I find mobile payment very useful during rush hours					
6	I accept mobile payment to avoid card transaction failures					
7	I accept mobile payment as it helps me to go digital, without paying PoS terminal charges to bank					
8	I accept mobile payment as it adds on to my business sales volume					
9	I accept mobile payment because it was easy for me to adapt MPS					
10	I accept mobile payment because receiving money through mobile payment is very easy					
11	I accept mobile payment because I find it very convenient as I don't have to handle cash or swipe card					
12	I accept mobile payment because my consumers insist to pay through it					
13	I accept mobile payment to give consumer an extra payment option					
14	I accept mobile payment so that I don't lose consumers to other merchants					
15	I feel merchant technical- support of mobile payment system is appropriate					
16	I have full trust on my mobile payment app provider					
17	I am fully satisfied from the current offerings by app provider					
18	I feel that per day/month limit should be increased					



19	I accept mobile payment to support cashless India					
20	I accept mobile payment to curb black money					
21	I have started accepting mobile payment after demonetisation					
22	I still think government should give more relaxation to merchant community for accepting mobile payment					
23	I will continue using mobile payment in future					

19. What do you feel about your city in aspect of MPS?

Strongly Disagree- 1, Disagree- 2, Neutral- 3, Agree- 4 and Strongly Agree- 5

S.No.	Description	1	2	3	4	5
1	I feel there is less awareness about MPS in my city					
2	I feel mobile payment is not accepted everywhere in my city					
3	I feel mobile payment is new trend in my city					
4	I find wide acceptance of mobile payment, a distant dream for my city					

20. While accepting mobile payment, do you feel your financial data is at risk

☐ Yes

☐ No

21. What major obstacle do you feel exist in success of mobile payment (you may choose more than one) :

☐ Cash & card is still preferred

☐ Low consumer interest

☐ Poor promotion by app provider

☐ Network availability

☐ Security

☐ Low digital literacy

22. Would you like to develop my own mobile payment app

☐ Yes

☐ No

23. Any suggestions you want to give for improvement of MPS

.....  
**Personal information**

24. Your name (optional) .....

25. Phone number (optional).....

26. What business are you into .....

## **PUBLICATIONS AND PRESENTATIONS**

### **List of Publications**

- Sonal., Kumar, V., & Swain, K. R. (2018). Awareness of Mobile Payment System Among Consumers: A Comparative Study in Ranchi and Kolkata. *IUJ Journal of Management*, 6(2), 30-33.
- Sonal., Kumar, V., & Swain, K. R. (2018). Usage of Mobile Payment by Consumers: A Study of Kolkata City. *Vaichariki*, 8(1), 447-453.
- Sonal., & Kumar, V. (2019). Status of M-payment and Its Adoption by Consumers. *IUJ Journal of Management*, 7(1), 63-68.
- Sonal., Swain, K. R., & Kumar, V. (2020). Mobile Payments: An Aid to Safe Payments During Pandemic Covid 19. *Sambodh*, 43(3), 39-44.

### **List of Presentations in seminars and conferences**

- Presented a paper titled “Impacts of Cyber Security Threats on Adoption of Mobile Payment System” in National Seminar on Cyber Security: Emerging Trends on November 2017.
- Presented a paper titled “Mobile Payment System by Merchants in an Indian Context: A Study on Kolkata City” in Globsyn Management Conference on March 2018.
- Presented a paper titled “Usage of Mobile Payment Systems by Consumers: A Comparative Study in Ranchi and Kolkata” in 5<sup>th</sup> National Seminar on Innovation in Marketing: A Path to Overcome Economic Slowdown on February 2020

