SYNOPIS OF THE THESIS ON

FACTORS INFLUENCING DIFFUSION OF MOBILE PAYMENTS

With reference to Delhi-NCR

Doctoral Thesis Submitted

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

DOCTOR OF PHILOSOPHY

In

MANAGEMENT

Suchitra Maurya

Enrolment Number: 19FMR CJHN01011

Under the guidance of Research Supervisor

Dr. Mridanish Jha

Associate Professor

ICFAI University Jharkhand,

Ranchi, India

November 4, 2024

CONTENTS Page No.

1.Introduction

This study aims to explore the changing landscape of payment systems, particularly focusing on what drives the adoption and growth of mobile payment systems in the Delhi-NCR region. By combining the Technology Acceptance Model (TAM) with the Diffusion of Innovation Theory (IDT), the research intends to offer a thorough understanding of how these frameworks interact to influence user behaviour. The study will measure the impact of IDT factors, including personal adoption-related aspects and social/external influences, on the elements of TAM in relation to mobile payment systems. It will also investigate how key TAM factors, like perceived usefulness and perceived ease of use, affect user satisfaction with these systems. Lastly, the research will investigate whether demographic factors such as age, gender, income, and education play a significant role in user satisfaction. Through these objectives, the study aims to reveal important insights into the dynamics of technology adoption and customer satisfaction in the mobile payments sector

In the digital world of today it's important that the way our money is moved around and processed is closely monitored and regulated. As crores of rupees change hands every single minute, the payment systems are closely monitored and regulated primarily for customer safety and broadly for safety of the financial market infrastructures to ensure that payments in the economy are flowing smoothly and seamlessly. This is the reason why regulators and the sovereign are also involved in managing stable, secure and smooth operations in the country.

The year 2016 was a watershed year for India as it saw a few milestones, first was the demonetization of higher denomination notes, 2nd was the introduction of UPI platform by the NPCI which was a path breaking technology as it allowed the third-party operators to leverage on the platform and offer payment services. The third and most likely the most

important factor was the availability of free/ low-cost data by primarily Jio which led to many citizens onboarding to the digital platform. The development of the fintech industry in India and availability of aggregator-based services around the same time, led to a change in lifestyle aided by technology. The mobile payments technology caught on in a big way in India.

There have been many changes to the demographics of the country and the payment ecosystem in the last decade. The availability of bank accounts, affordable tariffs for data, increased tele density and a population with a median age of approximately 29 years are important aspects that poise India to take on the opportunities of Mobile payments and to serve as an alternate and efficient payment systems model.

Further, the last few years have also seen changes to the marketplace fuelled by affordable data and smart phones and the emergence of fintech industries. There has been an emergence of app-based aggregator service marketplace in certain segments particularly the aggregator-based food delivery apps and transport services. There has been a consolidation of a digital marketplace on account of large online shopping platforms, as well as the market in the social media platforms like Instagram and Facebook. The physical marketplace has also embraced digital payments in a big way.

Thus, the stakeholders in the payment ecosystem need to understand and appreciate the importance of mobile payments and the factors that influence their diffusion as it brings efficiencies to the marketplace in times of turnaround time of transactions, reduces business cycles and deepens and speeds up economic growth in the country.

2. Relevance of the study

With the advancement of technology, the conventional payment methods of cash and negotiable instruments have gradually been replaced by technology-based payment systems, the most recent of which being mobile payments.

To enable account-to-account transfers based on mobile number seeding in the bank accounts that clients kept, mobile payments technology was initially deployed in India as an IMPS feature in 2010. Paytm advanced as a respectable cash substitute following demonetization in 2016. The Unified Payment Interface, which allowed payments through virtual addresses—that is, without requiring the actual account number of the transacting entities to be shared—was introduced by National Payments Corporation of India in the same year. This enhanced the security of customer bank account information. An additional layer to the transaction process was added by the flexible UPI technology, which also permitted third-party payment interfaces. Several payment service providers resulted from this (Google pe, Phone pe, Mobi Kwik, BHIM etc.) A change in the way these services are paid for has resulted from telecom service providers offering reasonably priced data service and from the distribution of products and services through apps. The methods for paying utility bills, transportation bills (Uber/Ola), intercity tickets, and food delivery bills (Swiggy/Zomato) have changed. There is a possibility that these external factors have influenced customer payment habits as the ecosystem in which we operate has changed due to the availability of affordable data, app-based services, and affordable smartphones, as evidenced from the country's daily volume of processed mobile payment transactions growing exponentially. The factors that influence the diffusion of UPI-based mobile payments, being a novel and disruptive technology merit an investigation to further the diffusion by making the appropriate adjustments to the payment ecosystem. This research will look at the factors influencing the diffusion of mobile payments in Delhi-NCR.

Payment systems affect turnaround times and gives settlement finality. Thus, a quicker turnaround time translates into more efficient and productive money management and a greater contribution to economic growth.

That apart, mobile payment is also a way of providing financial inclusion and quick access to a vast majority of the population, in a developing country like India. It makes economic sense to provide quality banking services including financial inclusion by way of mobile banking, in view of insufficient banking infrastructure in a developing country like India, to cater to footfalls of customers at brick-and-mortar branches as well as in a digital mode. It offers a personalised banking facility within the confines of their homes and is a on the go payment channel.

3. Research Scope

The, the study attempts

1. To quantify the influence of IDT factors (Relative Advantage, Complexity, Compatibility, Observability, Trialability) over the TAM constructs of perceived usefulness and ease of use in relation to users of mobile payment systems of Delhi-NCR region.
2. to investigate how user satisfaction is influenced by perceived usefulness and ease of use (TAM factors). of mobile payment system users of Delhi-NCR region.
3. To investigate if user satisfaction is influenced by demographic characteristics of mobile payment system users in Delhi-NCR region.

The population or sample: The study's target population are the residents of Delhi-NCR who are users of mobile payment services. This study seeks to gain insights on the factors influencing diffusion of Mobile Payments. This study was carried out in Delhi -NCR to measure the influence of the factors influencing diffusion of mobile payments. Delhi (including NCR) NCR being the capital of India, is a hub of economic activity with well-established app-based aggregator services for transportation, food delivery etc. Delhi-NCR is home to the physical marketplace as well as the digital marketplace, having diversity in

the residents. Therefore, it was considered an appropriate population for examining factors influencing the diffusion of mobile payments.

The people who live in Delhi-NCR and utilise mobile payment services are the study's target group. With this study, we hope to learn more about the aspects that influence the diffusion of mobile payments. This study was conducted in the National Capital Region (NCR) of Delhi to assess the factors driving the diffusion of mobile payments. As India's capital, Delhi (including the National Capital Region, or NCR) is a centre of economic activity with well-established app-based aggregator services for food delivery, transportation, and other services. In addition to having a diverse population, Delhi-NCR is home to both physical and virtual marketplaces. As such, it was deemed a suitable demographic to investigate the variables impacting the adoption of mobile payments.

4. Review of Literature

The present study is an attempt to examine the different factors influencing the diffusion of mobile payments. The examination covers the personal factors influencing adoption as well as the external factors that could have influenced the adoption process.

The Ph.D. Thesis on Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Bengaluru City (Pratim, 2017) showed that utilisation was highest among those under thirty, and it decreased with age. Additionally, people accept mobile wallets significantly more readily, and they utilise and adopt them at higher rates. Limitations: Only credit card, debit card, and virtual wallet services are included in the study. Both users and non-users of these contemporary banking devices were considered in the study. Surveys were given to users and non-users at random. The study's geographic scope is limited to Bengaluru and its environs. The study determines the acceptability of virtual wallets, a component of mobile payments, and looks at the acceptability of payment channels other than cash. The results are applicable to the subject matter of this study and

may also be investigated in other jurisdictions. It solely relates to mobile wallets, not mobile payments in general. Bangalore was the population under consideration. The study could be expanded to include other jurisdictions.

The Ph.D. Thesis “A Study on customer perception towards mobile banking in Punjab” (Vasudeva, 2017) demonstrates in its findings that there was awareness of the various mobile banking services available in India and that these services are developing. Additionally, it was shown that consumers preferred mobile banking over online banking and were eager to do transactions via their phones. It was also discovered that m-banking was favoured above bank branches' convenient locations. These results indicate that m-banking services in India have a lot of promise. However, because of the disparity in the researcher's understanding, there can be restrictions on how their findings are interpreted. The convenience sampling technique was used in the current study because the data regarding m-banking users was not accessible in advance. Respondents who were present in the bank branches during the visits filled out the questionnaires. The same can be said for other jurisdictions, given that compatibility and relative advantage played a part in the adoption of self-service banking technology.

The academic article "Mobile Banking Adoption in a Developing Country like India published in Drishtikon: A Management Journal (*Mobile_Banking_Adoption_in_a_Developing.Pdf Gandhi Sheroy.Pdf*, n.d.)" concludes that the market for mobile banking is expected to be quite promising, despite it being a new concept. The concerns about security, however, also serve as a barrier. The rapid advancement of technology and the perceived use of this technology are the driving forces behind the adoption of mobile banking. The study found that the adoption of mobile payments using mobile banking as a substitute for carrying and using cash was positively impacted by the service cost, perceived compatibility, and Reference Group Influence. The

sample size used in this study was insufficient to allow the findings to be broadly applied. Additionally, only respondents who used mobile banking services in India's largest cities were included in the survey. This might be investigated further in different jurisdictions and with different models.

The Ph.D. Thesis “A study of awareness and perspective of mobile banking - in Southern Rajasthan” (Khan, 2016) revealed two sets of results: a set from the bank employees and a set from the clients. The bank authorities felt that the new technology required specialised training to function, but they also felt that it increased profitability by decreasing transaction costs and increasing service efficiency for remote clients. Conventional banking was deemed to be the optimal choice by the bank officials. The clients thought it was a trustworthy and practical tool for improving their money management. Employees in the banking industry have reported benefits from mobile banking. Positive customer perception was also discovered. A small sample of south Rajasthani consumers is used in this study. Factors such as bank types, account types, and computer literacy were not considered. The scope of this study is restricted to the degree of consumer cooperation and information. Employees in the banking industry have reported benefits from mobile banking. Positive customer perception is also present. It is also possible to reproduce the study in different jurisdictions.

The academic article on “A Framework of Mobile Banking Adoption in India”(Kumar et al., 2020) demonstrated that, together with the constructs of TAM, viz. perceived usefulness and perceived ease of use, as well as all other relevant behavioural factors, namely subjective norms, personal innovativeness, trust, and self-efficacy have exerted a statistically significant positive effect on the mobile banking adoption intention of customers. However, this study did not explore the impact of moderating variables such as risk associated with technology, availability of alternative modes, compatibility, quality of

the mobile interface, and demographic variables, which might predict usage more accurately. The demographic variables such as gender, age, and occupation have not been considered in the theoretical model and structural model. The study used demonstrated that all relevant behavioural factors, including subjective norms, personal innovativeness, trust, and self-efficacy, along with the TAM constructs of perceived usefulness and perceived ease of use, have had a statistically significant positive impact on customers' intention to adopt mobile banking. The impact of moderating variables, which may more accurately predict usage, such as technological risk, the availability of alternate means, compatibility, the quality of the mobile interface, and demographic variables, were not examined in this study. The theoretical model and structural model do not consider demographic characteristics like gender, age, and occupation. The convenience sample used in the study might not be a very good way to reflect the target population. Because the sample size was rather small, conclusions about the study's findings must be made with caution. This study suggested a few areas to explore in further research. The study's findings can be examined and validated in other emerging nations with comparable social and demographic compositions. demonstrated that all relevant behavioural factors, including subjective norms, personal innovativeness, trust, and self-efficacy, along with the TAM constructs of perceived usefulness and perceived ease of use, have had a statistically significant positive impact on customers' intention to adopt mobile banking. The impact of moderating variables, which may more accurately predict usage, such as technological risk, the availability of alternate means, compatibility, the quality of the mobile interface, and demographic variables, were not examined in this study. The theoretical model and structural model do not consider demographic characteristics like gender, age, and occupation. The convenience sample used in the study might not be a very good way to reflect the target population. Because the sample size was rather small, conclusions about

the study's findings must be made with caution. This study suggested several areas to explore in further research. The study's findings can be examined and validated in other emerging nations with comparable social and demographic compositions.

It is also possible to re-examine and practically validate the theoretical model in future study. Future conceptual and empirical research may also consider a few more variables, such as the quality of mobile services, technological readiness, compatibility, and technology risks, and examine how these relate to the adoption of mobile banking.

The academic article “Digital Wallet Adoption: A Literature Review” (Jain & Singhal, 2019) examined and determined a number of factors influencing how consumers adopt digital banking. They offered intriguing new perspectives on the spread of online banking. It was noted that the most often studied regions were Africa (Zimbabwe, South Africa), Asia (East Asia, Taiwan, China, and Korea), Southeast Asia (Singapore and Malaysia), and Islamic countries (Iraq, Iran). A small number of studies were conducted in Europe (Finland, Turkey, Germany). The amount of empirical and conceptual research in the subject of mobile banking services has expanded dramatically since 2009. To explain the use of M-Banking technology, most researchers in this literature review, however, rely on TAM and its modification. Additionally, IDT is the next most popular model (Innovation diffusion technology). Many features, constructions, and other elements that encourage the adoption of digital banking and the risk associated with its use are studied using a variety of models, theories, and frameworks. According to the literature review, several independent variables, such as technology usage, have a beneficial effect on adopters but a negative effect on non-adopters. Aside from these shifting social and cultural variables, demographics do matter a lot when it comes to technology adoption or non-adoption."

This paper “Determinants Of Behavioural Intention On E-Wallet Usage: An Empirical Examination In Amid Of Covid-19 Lockdown Period”(Revathy & College, 2020), The

objective of the empirical study was to examine the important determinants of behavioural intention regarding the use of e-wallets during the COVID-19 lockdown. To obtain the opinions of e-wallet users in the study area, this study used an empirical research design in conjunction with an online survey approach. The findings show that while effort expectancy has no discernible effect on e-wallet usage, perceived security, social influence, and performance expectancy are positive and significant predictors of e-wallet usage. The major data gathering strategy for the study was an online survey. Therefore, the online survey's limitations will also apply to this empirical investigation. I t is not appropriate to extrapolate the results of the original poll to the entire state or nation, as only the wallet users of Chennai, Tamil Nadu, participated. To choose responders, nonprobability convenience sampling has been used. Therefore, the current study is subject to the same constraints as non-probability sampling. The primary data was only gathered during the COVID-19 shutdown. As a result, perceptions before and after lockdown may differ from those found in this study. The current study might also be expanded to additional states, towns, and nations to comprehend the behavioural intentions of Indian customers regarding e-wallets. To investigate demographic variations in e-wallet usage intention, a comparison study across various gender, age, and income groups may be carried out. Soon, a comparison analysis of usage intentions before and after the COVID-19 lockdown period may be investigated to yield more insightful data for the development of e-wallets. It is possible to compare the perceptions of e-wallet users in the public and private sectors to investigate variations in usage patterns among e-wallet users in India.

The study in the Ph.D. Thesis “Adoption and usage of innovative techniques: a study on mobile banking in Coimbatore city” (Begum, 2015) concluded that younger age groups with at least a higher secondary education level were the ones most likely to use mobile banking. The model included "Trust" in addition to the elements of TAM, TRA, and IDT.

According to the research, although consumers thought mobile banking was simple to use, they were hoping for more "security" and better customer care policies. It was discovered that the barrier preventing mobile banking uptake was perceived risk. Attitude, perceived utility, and perceived ease of use all strongly influenced the desire to utilise mobile banking. Limitations: The respondents to the current study were given the interview schedule, which was used to collect the data. The study is also subject to the constraints of primary data collecting. 2. The researcher was able to convince the respondents to provide the necessary data after much persuasion. 3. Because the study was "micro" in scope and only 400 sample units provided replies, its conclusions cannot be broadly applied. Research deficit and potential areas of investigation: It also implied that banks should focus on enhancing security and safety to win over customers' trust; to examine the financial viability of mobile banking technology; to look at factors that promote or hinder the use of different mobile phone services; and to research the challenges that Indian consumers have while adopting and using mobile banking services.

The study in the article “Factors Affecting Mobile Banking Adoption Behaviour in India published in Journal of Internet Banking and Commerce) ((Shankar, 2016) implies that if banks can meet customer expectations for services, customers will use mobile banking. Although it believed that banks offered their customers a high degree of security, it also believed that speed and ease of use were disincentives. The study looked at some empirical data regarding Indian consumers' intentions to adopt m-banking. Based on a review of pertinent literature, a proposed research framework was developed. It was discovered that consumer adoption intentions of mobile banking in India are significantly influenced by factors such as awareness, usefulness, ease of use, compatibility, self-efficacy, security and privacy risk, social influence, and financial cost. Usefulness is the most important component, while social influence has the least effect on the rate of customer acceptance.

In place of m-banking adoption, satisfaction has been employed as the dependent variable in the analysis. Limitations and potential areas for further study: The questionnaire's use of closed-ended questions with a Likert scale has prevented respondents from expressing their own opinions freely. 2. An alternative statistical model, such as polynomial and exponential regression, would have been preferable for this study to gauge the extent of the shift in Indian consumers' adoption patterns. 3. Demographic factors including age, wealth, experience, and education might be used as moderating implies that if banks can meet customer expectations for services, customers will use mobile banking. Although it believed that banks offered their customers a high degree of security, it also believed that speed and ease of use were disincentives. The study looked at some empirical data regarding Indian consumers' intentions to adopt m-banking. Based on a review of pertinent literature, a proposed research framework was developed. It was discovered that consumer adoption intentions of mobile banking in India are significantly influenced by factors such as awareness, usefulness, ease of use, compatibility, self-efficacy, security and privacy risk, social influence, and financial cost. Usefulness is the most important component, while social influence has the least effect on the rate of customer acceptance. In place of m-banking adoption, satisfaction has been employed as the dependent variable in the analysis. Limitations and potential areas for further study: The questionnaire's use of closed-ended questions with a Likert scale has prevented respondents from expressing their own opinions freely. 2. An alternative statistical model, such as polynomial and exponential regression, would have been preferable for this study to gauge the extent of the shift in Indian consumers' adoption patterns. 3. Demographic factors including age, wealth, experience, and education might be used as moderating variables in future to the exploration of m-banking.

Even if the study's model and constructs are important, it should be noted that the paper was published in February 2016, which is before the NPCI launched the UPI platform as a payment channel. It is assumed that the analysis is predicated on the use of mobile banking as a remittance channel rather than a payment method, which emerged in 2016 and spread subsequently. This study offers significant insights and conclusions. The same may be applied to analyse current factors impacting the diffusion of mobile payments.

In study in the Ph.D. Thesis on “Study on Customers Perception towards Mobile Banking Services with reference to Namakkal District, Tamil Nadu, India”(Senthilkumar, 2016) finds that even while mobile banking services have advanced, users still struggle to stay up to date with the constant updates in technology and have a sense of unease when using these services. Frequent training and awareness campaigns have been advised. Limitations: Customers of a few banks in Tamil Nadu's Namakkal District serve as the study's base. Respondents' perceptions were limited to mobile banking services. The opinion of the customers was not considered positive. However, there was limited access to high-speed internet and affordable data before 2016, therefore the research is out of date and needs to be reviewed.

The academic Article "Analysing the Barriers towards Sustainable Financial Inclusion using Mobile Banking in Rural India published in Indian Journal of Science and Technology (Behl et al., 2016) concluded that users' and potential users' perceptions play a major role in determining how mobile banking technology is used. The findings indicate that perceptions of risk aversion, utility, and convenience of use all influence how widely mobile banking is used in rural areas. The results also suggest that greater use of mobile banking will lead to greater proficiency. Future research in this field is warranted as it could lead to a quick increase in usage and adoption, hence reducing their dependency on bank branches. The work integrated the ideas of diffusion theory with the innovation of the

Technology Acceptance Model (TAM). The findings suggested that before improving the technology, banks and other financial organisations should investigate how much credibility risk is perceived when it comes to mobile banking. Peer pressure and user perception both contribute to the lifespan of mobile banking. The study is limited to the rural population of district of Ajmer; the study could be extended to other regions. The paper was published in May 2016, before the introduction of the UPI platform by NPCI and subject needs to be revisited.

The Ph.D. Thesis on Determinants on Adoption Behaviour of Indian Customers Towards Mobile Banking Services(*Vally Divya.Pdf*, n.d.). The study concluded that customers' adoption behaviour toward mobile banking is significantly and favourably influenced by their perceptions of perceived compatibility (PCOM), perceived service cost (PSC), reference group influence (RGI), attitude, and perceived risk. The study was conducted in Delhi NCR, which serves a vast range of clients from across India. However, it is possible that the findings cannot be broadly applied.

Research Vulnerability: The study was carried out using a reference period earlier than 2016. The same might be looked at regarding mobile payments as there have been major changes made to the digital ecosystem and the introduction of mobile payments.

The academic Article "Analysing the Barriers towards Sustainable Financial Inclusion using Mobile Banking in Rural India published in Indian Journal of Science and Technology (Behl & Pal, 2016) concluded that users' and potential users' perceptions play a major role in determining how mobile banking technology is used. The findings indicate that perceptions of risk aversion, utility, and convenience of use all influence how widely mobile banking is used in rural areas. The results also suggest that greater use of mobile banking will lead to greater proficiency. Future research in this field is warranted as it could lead to a quick increase in usage and adoption, hence reducing their dependency on bank

branches. The work integrated the ideas of diffusion theory with the innovation of the Technology Acceptance Model (TAM). The findings suggested that before improving the technology, banks and other financial organisations should investigate how much credibility risk is perceived when it comes to mobile banking. Peer pressure and user perception both contribute to the lifespan of mobile banking. The study is limited to the rural population of district of Ajmer; the study could be extended to other regions. The paper was published in May 2016, before the introduction of the UPI platform by NPCI and subject needs to be revisited.

5. Research Gap

Much of the literature concentrated on figuring out what was preventing adoption. This is pertinent given that mobile banking technology is relatively new in the rest of the globe and barely ten years old in India. Still, small-scale investigations have shown that acceptability is occurring, indicating that the diffusion process is succeeding. The closest in the context of this research is The Ph.D. Thesis on Adoption Behaviour of Indian Customers Towards Mobile Banking Services (Verma & Nehra, 2016) It was determined by the study that customers' adoption behaviour towards mobile banking is significantly and favourably influenced by their perceptions of perceived compatibility (PCOM), perceived service cost (PSC), reference group influence (RGI), attitude, and perceived risk. Perceived usefulness and perceived ease of use are important criteria that impact the adoption of mobile banking, according to the study, along with observability and RA. The study was conducted in Delhi NCR, which serves a vast range of clients from across India. However, it is possible that the findings cannot be broadly applied.

Research gap identified: This research was conducted prior to the start of the UPI platform, which allowed for seamless mobile payments in the true sense, this report was published in 2016. The research study concentrated on the NEFT/IMPS-based banking technology that

was in use prior to 2016 and required entering the beneficiary's account data, i.e., using mobile banking.

The emphasis was not on mobile payments, or "on the go" payments, which were non-existent at the time. This research has been suggested to fill the void after the UPI platform in 2016 brought about a noticeable shift in the payment's environment.

6. Objectives of the Study

The aim of this study is to critically examine the factors influencing the diffusion of mobile payments in the Delhi-NCR region. The study will consider the perspectives of customers and the demographic profiles that may affect this diffusion. Consequently, the research objectives are crafted to align with these overarching themes:

To measure the impact of factors of IDT (Relative Advantage, Complexity, Compatibility, Observability, Trialability) over Perceived Usefulness and Ease of Use (factors of TAM) in context of mobile payment system users of Delhi-NCR region.

To examine the impact of Perceived Usefulness and Ease of Use (factors of TAM) over user satisfaction of mobile payment system users of Delhi-NCR region.

To examine whether the demographic factors impact the user satisfaction of mobile payment system users in Delhi-NCR region.

7. Research Hypotheses

For the current study, the following hypotheses will be examined:

H1: There is a significant impact of Trialability on Perceived Usefulness of mobile payment system users.

H2: There is a significant impact of Relative Advantage on Perceived Usefulness of mobile payment system users.

H3: There is a significant impact of Complexity on Perceived Usefulness of mobile payment system users.

H4: There is a significant impact of Compatibility on Perceived Usefulness of mobile payment system users.

H5: There is a significant impact of Observability on Perceived Usefulness of mobile payment system users.

H6: There is a significant impact of Trialability on Ease of Use of mobile payment system users.

H7: There is a significant impact of Relative Advantage on Ease of Use of mobile payment system users.

H8: There is a significant impact of Complexity on Ease of Use of mobile payment system users.

H9: There is a significant impact of Compatibility on Ease of Use of mobile payment system users.

H10: There is a significant impact of Observability on Ease of Use of mobile payment system users.

H11: There is a significant impact of Perceived Usefulness of mobile payment system on user satisfaction of mobile payment system users.

H12: There is a significant impact of Ease of Use of mobile payment system on user satisfaction of mobile payment system users.

H13a: There is a significant impact of different genders on user satisfaction of mobile payment system users.

H13b: There is a significant impact of different age groups on user satisfaction of mobile payment system users.

H13c: There is a significant impact of different marital status on user satisfaction of mobile payment system users.

H13d: There is a significant impact of different educational level on user satisfaction of mobile payment system users.

H13e: There is a significant impact of different occupation on user satisfaction of mobile payment system users.

H13f: There is a significant impact of different income level on user satisfaction of mobile payment system users.

H13g: There is a significant impact of different mobile payment duration on user satisfaction of mobile payment system users.

8. Research Methodology

The research methodology i.e., the research design, the sources of data, sampling design applied for this research, research instruments opted for data collection are described in the following sub sections. Various analytical tools which are used for the analysis of the collected data to arrive at the conclusions are also explained.

This study employs a hybrid model combining the E-CRM framework, the Technology Acceptance Model, and Rogers' Diffusion of Innovation Theory, while also considering the impact of demographic factors. Therefore, the study addresses following questions:

How do factors of IDT (Relative Advantage, Complexity, Compatibility, Observability, Trialability) impact Perceived Usefulness of Mobile payment system for mobile payment system users?

How do factors of IDT (Relative Advantage, Complexity, Compatibility, Observability, Trialability) impact Perceived Ease of Use of Mobile payment system for mobile payment system users?

How does Perceived Usefulness and Perceived Ease of Use (factors of TAM) impacts satisfaction of mobile payment system users?

How does demographic background influence user satisfaction of mobile payment system users in Delhi-NCR region.

Research Design

The objective of this study is to comprehensively investigate the diverse factors influencing the diffusion of mobile payments. This exploration will be conducted using a descriptive, quantitative, and cross-sectional research design.

The descriptive aspect aims to provide a detailed portrayal of consumer behaviour specific to the adoption and use of mobile payments in the Delhi-NCR region. The quantitative approach involves systematically collecting numerical data through structured surveys administered to our target audience in this region. The cross-sectional design enables us to capture a snapshot of consumer attitudes, preferences, and behaviours related to mobile payments at a specific moment in time (Portier, Fabi and Darius, 2000; Kesmodel, 2018). This comprehensive methodology aims to provide nuanced insights into the complex dynamics of mobile payment adoption, offering valuable and timely information to enrich our understanding of the subject matter.

Research sampling and Data Collection

Participants in this study are residents of the Delhi-NCR region, India, particularly those who actively use or are interested in mobile payment systems. Specific criteria have been established for selecting the sample:

Residence: Participants must reside in the Delhi-NCR region.

Age: Participants should range between 18 and 65 years.

Mobile Payment System Users: Individuals who actively use mobile payment systems or are interested in providing insights into their usage.

Gender: Both male and female participants will be included to ensure gender diversity.

Occupation: Participants from diverse occupational backgrounds, including professionals, students, and others.

Socio-Economic Status: Participants representing various socio-economic backgrounds to capture a comprehensive view.

Language Proficiency: Adequate proficiency in the survey language (English language) to ensure accurate responses.

This selection criteria aims to assemble a diverse and representative group of participants from the Delhi-NCR region, focusing on those with direct experience or interest in mobile payment systems.

Population

In statistics, a population is the pool from which a sample is drawn for a study. Thus, any selection grouped by a common feature can be considered a population. A sample is a statistically significant portion of a population. This study was conducted for the population of Delhi-NCR. Delhi (including NCR) NCR being the capital of India, is a hub of economic activity with well-established app-based aggregator services for transportation, food delivery etc. Delhi-NCR is home to the physical marketplace as well as the digital marketplace, having diversity in the residents. Therefore, it was considered an appropriate population for examining factors influencing the diffusion of mobile payments.

According to Census 2011, the population of Delhi was around 16787941, which is further expected to become 3.2 million by 2023-34.

SAMPLE SIZE

It is important to calculate the size of the sample correctly mainly for two reasons. First, a sample intends to represent a population. Second, the data analysis and its interpretation to draw inferences of research that depends on the number of units for which the data is collected. These units can be responses from participants in a survey collected through a questionnaire.

While writing a thesis, researchers sometimes find it difficult to calculate the sample size. As mentioned by (Kothari, 2004), the sample should neither be too small nor too large. It should be optimum in size and fulfil the criteria of Representativeness, Efficiency, Reliability, Flexibility, and precision. According to the Kothari formula, the formula for sample size n is:

Rule of Thumb – This is one of the conventional approaches to determine sample size, as per this, the sample size should be at least ten times greater than the number of free parameters in the model was considered (Raykov & Marcoulides, 2006); (Wilson Van Voorhis & Morgan, 2007) With 41 items covering constructs and 7 items for demographic data, a minimum of 480 observations were deemed as minimum necessary for robust data collection (Rvspk et al., 2020).

The researcher has collected and finalized a data set of 684 samples adequate for this study. For this study, a carefully crafted questionnaire was developed exclusively in digital format using Google Forms to maximize convenience and accessibility for respondents. The researcher personally oversaw the data collection process ensuring adherence to strict procedural standards and minimizing potential response biases. Efforts were made to maintain objectivity and avoid any influences that could affect the integrity of the data. Participation in the survey was entirely voluntary, with adherence to the ethical principle of informed consent. Respondents were encouraged to participate willingly, with clear

assurances that all information provided would be used solely for academic purposes, and that confidentiality and privacy would be maintained throughout the process. These measures were critical in ensuring the credibility and robustness of the survey results. a pilot test was conducted with 100 respondents, representing approximately 25% of the total sample size. Data collection involved administering questionnaires and conducting personal discussions to gather detailed feedback.

The original version was condensed from 6 pages to a more concise and focused 4-page format. This revision aimed to retain all essential elements for adequate response while optimizing the overall efficiency and clarity of the survey.

The factors identified were factors of IDT i.e., Relative Advantage, Complexity, Compatibility, Trialability and Observability, factors of TAM i.e., Perceived Usefulness and Ease of Use and Customer Satisfaction.

9. Data Analysis

The fitness of the model or model validity was proposed to be examined by using the Exploratory factor analysis (EFA) which is a statistical procedure used to reduce many observed variables to a small number of "factors/components", reflecting that the clusters of variables are in common. In EFA the correlation among a group of observed variables is identified and transforms into a small number of related factors. Briefly, EFA captures the groups of observed variables which are consistently moving together. In this process the consistent movements of observed variables are identified through factor extraction and factor rotation. Therefore, EFA is a useful tool for investigating the relations among observed variables and a small number of underlying factors.

The adequacy of sampling is tested through KMO (Kaiser, 1974), while the strength of the relationship among variables is assessed through Bartlett's test of sphericity (Bartlett, 1954). It is worth noting that the indicators should be measured at the interval level.

Reliability & Validity

The internal consistency reliability (ICR) was assessed by computing the composite reliability coefficients (Fornell coefficients), of which values higher than 0.8 generally indicate acceptable reliability [19]. The ICR values ranged from 0.836 (Observability) to 0.938(Trialability). Since none of the values for all nine constructs were less than 0.8 as shown in Table12, the reliability of the scales could be accepted

Convergent Validity

The convergent validity was evaluated by the average variance extracted (AVE). According to related studies, AVE values higher than 0.5 are acceptable. For a satisfactory degree of discriminant validity, the square root of AVE of a construct should exceed the interconstruct correlations for the variance shared between the construct and the other constructs in the model]. In this research, although some of the variables' inter-correlations were relatively high, the convergent and discriminant validities of the model were both satisfactory, with all the AVE square roots above 0.771

The research model was tested using the partial least squares (PLS) method, a structural equation modelling (SEM) technique suitable for highly complex predictive models. The PLS gsoftware was used for the analysis, with the bootstrap resampling method (5000 boot strapped results) used to determine the significance of the paths within the structural model. Testing of the hypotheses revealed the following results:

Hypothesis 1and 6 posited that Trialability had a significant influence on Perceived Ease of Use and perceived usefulness in Usage of Mobile Payments.

Relative Advantage: HypothesisH2 and H7, hypothesising that Relative Advantage had a significant influence on Perceived Usefulness and Perceived Ease of Use was not supported by Results of statistical analysis

Complexity: H3 and H8, hypothesising that Trialability had a significant influence on Perceived Usefulness and Perceived Ease of Use was supported by statistical results

Compatibility: Hypothesis H4 and H9 hypothesising that Compatibility had a significant influence on Perceived Usefulness was supported; however, influence of compatibility on Perceived Ease of Use was not supported by statistical results.

Observability: Hypothesis H5 and H10, hypothesising that Observability had a significant influence on Perceived Usefulness and Perceived Ease of Use was supported by statistical results.

Influence of factors of TAM on User Satisfaction:

The results of H11 revealed a significant impact of Perceived Usefulness of mobile payment system on user satisfaction of mobile payment system users.

The results of H12 revealed that is a significant impact of Ease of Use of mobile payment system on user satisfaction of mobile payment system users.

Since 9 out of the 12 hypotheses in the model are significantly supported by the statistical results, this integrated IDT-TAM model can be used to better understand and predict diffusion of mobile payments. In this study, the value for R2 ranged from 0.210 to 0.449, reflecting a weak to moderate predictive power of the model, aligning with established guidelines.

The indirect influence of PEOU and PU on adoption/ intention/behaviour has been frequently discussed in the literature, which, however, is not included in our model. Thus, future studies should pay much more attention to the interaction factors, which are more dynamic perceptions

than subjective evaluations. Future studies could also focus on variants of mobile payments like NFC, pay to contact, QR code as well as convenience of Bharat Bill Pay facilities to understand the finer role of the payment variants in driving the diffusion process. The role

of payment of direct benefits by government under various schemes is an area worth pursuing.

10. Findings and Conclusions

An empirical test of the model with a survey among users of mobile payment technology in Delhi=NCR Region confirmed the basic hypotheses in the model. Therefore, the model is useful for understanding the factors influencing diffusion of mobile payment technology in Delhi-NCR. However, contrary to existing finding, it was observed that Relative Advantage did not have a significant influence on Perceived Usefulness and Perceived Ease of Use. There was a contradiction in the factor of wherein it was observed that Compatibility had a significant influence on Perceived Usefulness; however, it had no significant influence on Perceived Ease of Use. Based on these findings, on-going research should focus on longitudinal studies to discover the dynamics of Compatibility, Relative Advantage and its influence or otherwise on the diffusion of mobile payments, as well as to further develop the integrated IDT-TAM model.

11. Limitations of this Research

This research is restricted to the population of Delhi-NCR. This research has focussed on Mobile payments in totality. Since there are a few variants in the Mobile Payments landscape, going forward, further research may examine the variants of mobile payments i.e., QR code, NFC and mobile/ Virtual payment address based to examine the popularity and acceptance of these variants in the diffusion of mobile payments.

The online / retail shopping and other financial services are the ones that fund this payment technology by way of providing acceptance infrastructure. Their role and influence on the diffusion could also be taken up for further research as also a longitudinal study on the same.

This research has not specifically focused on security as an issue or factor in the diffusion process. The same could be covered in a more focused way.

The specific influence of social media shopping via WhatsApp, Facebook and Instagram is an area worth investigating as a separate research topic under the factor of compatibility. While the same have been broadly considered under the umbrella of compatibility, the same may be considered for future research.

The role of Bharat Bill Pay Services is a one stop gateway for payment of all utility bills on the UPI platform. This is a very useful feature on the platform and leads to synergies in record management, collection processes and serve as a reminder for timely bill payments. Its role and influence deserve a specific study.

12. Recommendations for future Research

This research has focussed on Mobile payments in totality. Since there are a few variants in the Mobile Payments landscape, going forward, further research may examine the variants of mobile payments i.e., QR code, NFC and mobile/ Virtual payment address based to examine the popularity and acceptance of these variants in the diffusion of mobile payments.

The online / retail shopping and other financial services are the ones that fund this payment technology by way of providing acceptance infrastructure. Their role and influence on the diffusion could also be taken up for further research as also a longitudinal study on the same.

This research has not specifically focused on security as an issue or factor in the diffusion process. The same could be covered in a more focused way.

The specific influence of social media shopping via WhatsApp, Facebook and Instagram is an area worth investigating as a separate research topic under the factor of compatibility.

While the same have been broadly considered under the umbrella of compatibility, the same may be considered for future research.

The role of Bharat Bill Pay Services is a one stop gateway for payment of all utility bills on the UPI platform. This is a very useful feature on the platform and leads to synergies in record management, collection processes and serve as a reminder for timely bill payments. Its role and influence deserve a specific study.

Bibliography

Begum, M. M. (2015). *Adoption and usage of innovative techniques: A study on mobile banking in Coimbatore city* [Avinashilingam Deemed University For Women]. http://hdl.handle.net/10603/77081

Behl, A., Singh, M., & Venkatesh, V. G. (2016). Enablers and barriers of mobile banking opportunities in rural India: A strategic analysis. *International Journal of Business Excellence*, *10*(2), 209. https://doi.org/10.1504/IJBEX.2016.077999

Jain, P., & Singhal, S. (2019). Digital Wallet Adoption: A Literature Review. *International Journal of Management Studies*, *VI*(1), 01. https://doi.org/10.18843/ijms/v6si1/01

Khan, M. (2016). *A Study of Awareness and Perspective of Mobile Banking in Southern Rajasthan* [Mohan Lal Sukhadia University]. http://hdl.handle.net/10603/166350

Kumar, A., Dhingra, S., Batra, V., & Purohit, H. (2020). A Framework of Mobile Banking Adoption in India. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(2), 40. https://doi.org/10.3390/joitmc6020040

Mobile_Banking_Adoption_in_a_Developing.pdf gandhi sheroy.pdf. (n.d.).

Pratim, K. S. (2017). *Usage of Plastic Money and Virtual Wallet as Modes of Payments in and around Bengaluru City*. ICFAI, Jharkhand.

Revathy, D. C., & College, G. N. (2020). DETERMINANTS OF BEHAVIOURAL INTENTION ON E-WALLET USAGE: AN EMPIRICAL EXAMINATION IN AMID OF COVID-19 LOCKDOWN PERIOD. *International Journal of Management (IJM)*.

Senthilkumar, N. (2016). *A study on customers perception towards mobile banking services with reference to namakkal district tamilnadu india* [Periyar University]. http://hdl.handle.net/10603/238674

Shankar, A. (2016). *Factors Affecting Mobile Banking Adoption Behavior in India*. *21*.

Vally divya.pdf. (n.d.).

Vasudeva, S. (2017). *Customer perception towards mobile banking in punjab a study of personal banking*. http://hdl.handle.net/10603/194814