TECHNOLOGY ADOPTION IN DEVELOPING ECONOMIES- AN ASPECT OF MOBILE BANKING ADOPTION BY INDIAN YOUTH

THESIS

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DEDICATION

I wish to dedicate this thesis to God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been the source of my strength throughout this program and on His wings only have I soared.

I also dedicate this work to my Mother who has taught me to persevere and be prepared to face the challenges with faith and humility. She has been a constant source of inspiration and whose encouragements has made sure that I give it all it takes to finish that which I have started.

And To my daughter, Steff, who have been affected in every way possible by this quest. Thanks for being so supportive - even when being 'without Mum' was hard. This work is for and because of Steff. It is dedicated to all our journeys in learning to thrive.

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Thank you. My love for you all can never be quantified. God bless you**.**

DECLARATION

I hereby declare that this thesis entitled "**Technology adoption in Developing Economies- An aspect of Mobile Banking adoption by Indian Youth"** by Monica, being submitted in fulfillment of the requirements for the Degree of Doctor of Philosophy in Management under Faculty of Management Studies of J.C. Bose University of Science & Technology, YMCA, Faridabad, during the academic year 2019, is a bona fide record of my original work carried out under guidance and supervision of **Dr. Renu Aggarwal, Assistant Professor**, Department of Management Studies and has not been presented elsewhere.

I further declare that the thesis does not contain any part of any work which has been submitted for the award of any degree either in this university or in any other university.

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CERTIFICATE

This is to certify that this thesis entitled "**Technology adoption in Developing Economies- An aspect of Mobile Banking adoption by Indian Youth**" by **Monica**, submitted in fulfillment of the requirement for the Degree of Doctor of Philosophy in Management under Faculty of Management Studies of J.C. Bose University of Science & Technology, YMCA, Faridabad, during the academic year 2019, is a bonafide record of work carried out under my guidance and supervision.

I further declare that to the best of my knowledge; the thesis does not contain any part of any work which has been submitted for the award of any degree either in this university or in any other university.

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ABSTRACT

Technology adoption is a complex, inherently social, developmental process where the individuals construct unique perceptions of technology that influence the adoption process. Mobile banking is an innovative technology by which users can access banking services, conduct financial services, including money payments and money transfers virtually without the need to visit the bank branches. Developing economies are the economies which are in process of continuous development and growth. The major developing economies of the world characterize slow progressions in technical proficiency. Age is inversely related to the keenness to experiment and use of new innovations. If the economy is developing, it will have high scope of technological development. Age serves as a strong pillar of opportunity if youth segment is considered as this segment is highly inclined towards technology experiment and use and India has one of the largest youth segments. Youth are known to be capable of playing a pivotal role in the socio-economic development and regeneration of the society. The daily and social lives of the young people are oriented towards the new media technologies like mobile phones, social networking sites etc. Youth forms a unique segment entirely different from all other segments. Hence their associations with mobile phones require a different set of examination to understand how this technology and services offered are analyzed and interpreted by them. In spite of high substantial proliferation of digital payment services in recent years, the uptake of mobile banking has been very low. This leaves big dilemma about the underlying factors that cause it. Recent researchers found that major chunk of Indian population still prefers to conduct transactions in cash mode and carry money transfers through bank branches. Since adoption is an individual based phenomenon and depends on the individual's psyche, perceptions and beliefs whether or not he/she intends to adopt a technology. So how does individuals perceive about adopting certain technology that decides his usage and continuance willingness needs to be researched to garner deeper understanding and insight. If the marketer and financial service providers are aware of the underlying factors that may lead to the adoption, it could help them in designing and delivery of proper services, product design and channels. So, there remains a strong need of detailed primary study to know the reasons for less preference mobile banking adoption by the individuals. In order to achieve this, qualitative and quantitative study were conducted. The qualitative study focused on study of youth segment involving students (12) and working professions (12) who used this technology and bank

practitioners (2) from public and private banks who were its providers. The findings from the in-depth qualitative study were used to develop framework to conduct quantitative study to study large number of users and to be able to generalize the findings. Therefore, survey of 1200 individuals comprising of students (600) and working professionals (600) who used mobile banking was done in the Delhi/NCR region. The questionnaire was developed on basis of the extensive literature review and the results of qualitative study followed by the pilot survey. The data was analyzed using frequency tables, Independent sample T test and one-way Anova and factor analysis (EFA) and path analysis by structured equation modelling (SEM) using Amos. It was found that Technology acceptance model (TAM) showed high predictive power in determining the adoption intention of mobile banking. Also, an additional construct, trust was found to have significant influence on perceptions and beliefs of the individuals. Though earlier studies have studied the adoption of mobile banking but the such studies in Indian context were very rare and have varied focus of the study. Moreover, the extension of original TAM model with trust construct in this unique segment have not been done in Indian context for the examination of mobile banking adoption. So, in the current study impact of trust along with the TAM constructs was studied with the help of SPSS and Amos software. Even though financial transactions and money transfers worth of millions of dollars were conducted on daily basis universally, but majority of these were executed using credit cards, debit cards or cash, especially in India. Mobile banking offers unique value proposition to users such as able to conduct transactions anytime, anywhere without any barrier of time and place. In addition, it offered huge value to the individuals who were out of formal financial systems, having no bank accounts by enabling their accessibility to a cost-effective alternative to outstrip the challenges of affordability along with eliminating the need to maintain minimum limits as required in traditional banking system. Moreover, in times of economic downturn, mobile banking technology offered progress by channeling the money effectively using technology. Mobile banking lays the foundation to achieve inclusive growth for the nation. Hence it is of paramount importance that the factors that promote its adoption must be identified and studied to bridge this gap. Hence the learnings based on this study conducted are included in the findings of the study and suggestions are provided to the practitioners and academicians. If these suggestions are implemented, it may lead to a better adoption and its impact on the individuals, corporates as well as the nation as a whole.

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LIST OF ABBREVIATIONS

Abbreviations	Full Form
3G	Third Generation
AEPS	Aadhar Enabled Payment System
ATB	Attitude Toward Behavior
ANOVA	Analysis of Variance
BBPS	Bharat Bill Payment System
BHIM	Bharat Interface for Money
BI	Behavioral Intention
B-to-C	Business to Commerce
CAGR	Compound Annual Growth Rate
CRM	Customer Relationship Management
DTPB	Decomposed Theory of Planned Behavior
E banking	Electronic banking
E payment	Electronic Payment
EDGE	Enhanced Data rates for GSM Evolution
e-Government	Electronic Government
e-Learning	Electronic Learning
FinTech	Financial Technology
FAQs	Frequently Asked Questions
GNP	Gross National Product
GOI	Government of India
GPRS	General Packet Radio Service
ICT	Information and communication technology
ICTD	Information and Communication Technologies and Development
IDT	Innovation Diffusion Theory
IMPS	Immediate Payment Service
IS	Information System
IT	Information Technology
IVRS	Interactive Voice Response System
m Banking	Mobile Banking
m Commerce	Mobile Commerce
MC	Mobile Commerce
m-Payment	Mobile Payment
MPS	Mobile Payment Services
NOFN	National Optical Fiber Network
NPCI	National Payments Corporation of India
OECD	Organization for Economic Co-operation and Development

PBC	Perceived Behavior Control
PBC	Perceived Behavior Control
PDA	Personal Digital Assistant
PDA	Personal Digital Assistants
PEOU	Perceived Ease of Use
POS	Point of Sale
PPI	Pre-Paid Instruments
PU	Perceived Usefulness
QR codes	Quick Response Codes
RBI	Reserve Bank of India
SBI	State Bank of India
SME	Small and Medium Enterprise
SMS	Short Message Service
SN	Subjective Norm
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model 2
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TRAM	Technology Readiness and Acceptance Model
TRI	Technology Readiness Index
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations International Children's Emergency Fund
UPI	Unified Payment Interface
USSD	Unstructured Supplementary Service Data
UTAUT	Unified Theory of Acceptance and Use of Technology
VNO	Virtual Network Operators
WAP	Wireless Application Protocol
WHO	World Health Organization

Chapter 1

Introduction

1.0 **Chapter Introduction**

This chapter introduces the key terms involved in the study, explains the youth and youth behavior in general, discusses on the aspects of adoption, technology adoption and youth behavior towards adoption of new technologies. It discusses the research purpose, research objective; significance of the study and the research methodology.

1.1 **Background**

Th progressive technology innovation draws us towards fast paced and highly competitive environment which forces people to adopt new technology to acquire relative advantage to be successful [1,2]. With the progressive interconnections between the countries globally, technology adoption prevails as a key factor in outlining the human development [3]. The massive problem of significant number of unbanked population existent in most of the developing countries can be effectively addressed by adoption of specific technologies [4].

Developing economies are the economies that have big disparity in GDP, display productivity gaps and exhibit big discrepancies in the form of welfare. Adoption of technology in developing countries makes huge impact to their growth for instance in reduction of expenses associated with manufacturing, constituting quality norms, long distance connectivity etc. However, there exists massive difference between countries relating to adoption of the technology.

Comin, Hobijn, and Rovito [5] in their study of 115 technologies through 150 countries found that "within a typical technology, the dispersion in the adoption levels across countries is about 5 times larger than the cross- country dispersion in income per capita." Why such gaps in technology appear? Some technology processes take long time to develop and adapt so the reasons causing it are difficult to know. Whereas the technologies of transformational nature are different, such as the technologies that did not even exist 20 years back but are now progressively accepted globally at different rates. As a result, they provide prospect to examine the impact of various factors on the acceptance of such technologies [5].

1.2 Technology

Technology according to Organization for Economic Co-operation and Development (OECD) means "systematic knowledge for the manufacture of a product, for the application of a process or for the showing of a service, including any integrally associated managerial and marketing techniques". Evans [14] defined technology "as the means by which man undertakes to change or influence his environment".

Information technology (IT) is a technology that is progressively being the facilitator of processing of information. It is also the enabler for the organizations such as banks to create efficiency in their processes and provide differentiated offerings to its customers. As matter of fact, a strong financial system is deemed as a major prerequisite for effective performance and sustenance of any economy. The progress and growth of a financial system, on the other hand, is largely dependent on the progress of its banking system as it is leading constituent of financial services business [2]. Amidst highly competitive environment, the banks in recent years have recognized the need to continuously reinvent themselves and remain updated to offer services that provide convenience and reliability to conquer customer satisfaction and retention [16]. Banking services are recognized as deeply information intensive services that depend strongly on data and information in order to assimilate, process, and distribute required information to the intended users. Substantial innovations in information technology have vastly influenced the financial services industry [18]. The internet is attributed as most economical distribution channel to offer uniform and standardized bank services like account services or transfer of funds [17]. As indicated by [19] businesses in future would be competing not only in the physical markets, but also in the virtual markets. Therefore, the banks are increasingly creating their presence and service offerings through traditional physical mode as well as electronic mode. Moreover, increasing competitive forces, opines Gikandi and Bloor [20] drives the adoption of these innovative electronic modes [20].

1.3 Adoption

Adoption is defined as "a decision to make a full use of an innovation "by Rogers [21]. Innovation is "an idea, practice, or object that is perceived as new by an individual or another unit of adoption" (Rogers [22], p. 11). Rogers and Shoemaker [23] advocated that users pass across "the process of knowledge, persuasion, decision and confirmation" prior to their adoption of any the technology.

"Adoption theory examines the individual and the choices an individual makes to accept or reject a particular innovation" [24]. "Diffusion theory, alternatively, takes a macro-perspective on the spread of an innovation across time" [24]. It is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, [22], p. 5). Adoption, hence, is a subset of diffusion process.

The decision to go for an adoption as described by Rogers, [22] happens in five stages that user's pass through while evaluating an innovation. The first phase is awareness about the new technology. The individual's characteristics impact the awareness of a given technology, as the change sought in the individual is innate trait; along with socioeconomic factors, and other change agents (media). The next phase is persuasion that is becoming aware about the major characteristics of the technology to form a decision about adopting or not adopting the given technology. Third phase is the final result of the individual's choice or accepting or rejecting the technology. Fourth phase is enactment on the decision so taken. Final phase is phase 5, where the individual introspects upon his decision and implementation and decides on continuing or not with the given innovation [22].

1.4 Technology Adoption

Straub [24] established in his study vis-à-vis technology adoption and diffusion theories that "(a) technology adoption is a complex, inherently social, developmental process; (b) individuals construct unique (but malleable) perceptions of technology that influence the adoption process; and (c) successfully facilitating a technology adoption needs to address cognitive, emotional, and contextual concerns".

Straub [24] suggested that "It does not matter if the idea, practice, or object is objectively new; rather, it is the perception of novelty. In addition, innovation also does not necessarily mean better or that the new idea is more beneficial to an individual. Whereas innovation can refer to something abstract, like an idea, it can also be concrete, like a new piece of technology" [24]. Mobile banking, for instance, is the technological innovation that holds immense capability to influence the development process by addressing the cognitive, emotional and contextual concerns. Recent

researches have established that innumerable disparities existing and hampering the growth in developing countries can be addressed by this digital tool that not only facilitates transactional but transformational change in financial economy. Banking the unbanked population, for instance, through mobile banking can itself create an environment of inclusive society and help economy get rid of many issues as shown in the photograph 2.1 below:

Goal	Impact from digital financial inclusion
1. No poverty	▪ Poor people and small businesses are able to invest in their future ▪ More government aid reaches the poor as leakage is reduced
2. Zero hunger	▪ Farmers are better able to invest during planting seasons and smooth consumption between harvests ▪ More food aid reaches the poor as leakage is reduced
3. Good health and well-being	▪ Increased government health spending as leakage is reduced ▪ Financial inclusion for women can increase spending on health care
4. Quality education	▪ Digital payments to teachers reduce leakage and absenteeism ▪ Micro tuition payments increase affordability ▪ Financial inclusion for women can increase spending on education
5. Gender equality	▪ Digital reduces women's physical barriers to gaining an account ▪ Women have more control over their finances and their businesses
7. Affordable and clean energy	▪ Mobile pay-as-you-go schemes create access to clean energy ▪ Better targeted subsidies increase use of renewable energy
8. Decent work and economic growth	▪ Greater pool of savings increases lending capacity ▪ Data history of poor and small businesses reduces lending risks
9. Industry, innovation and infrastructure	▪ Digital finance enables new business models and products ▪ More public and private capacity to invest in infrastructure
10. Reduced inequalities	▪ Financial inclusion gives greatest benefit to very poor people ▪ More government aid available as fraud and theft are reduced
16. Peace, justice and strong communities	▪ Digital records of financial transactions increase transparency and enable better monitoring of corruption and trafficking

Photograph 1.1: Impact from digital financial inclusion

SOURCE: UN Sustainable Development Goals; McKinsey Global Institute analysis

1.4.1 Technology adoption and Electronic platforms for banking

In order to enhance efficiency and remain competitive, offerings that are smarter and branded must be promoted especially self-services [25]. To promote adoption of technology, providers worldwide should create offerings that give more comfort, support and convenience such as easiness of use across multiple financial services like video banking, ATMs unified with smartphone, customized websites, biometric services and electronic money. Hence, it is essential for organizations to understand the changing needs of its customers to cater them well and remain aware of the market trends. Banks worldwide, therefore, are increasingly investing in these innovative developments to offer better services to their customers [26]. The introduction of wireless internet and the mobile phones have created a new market for business and an exceptional service experience for the customer. The varied range of mobile devices including smartphones, PDAs (personal digital assistants) and tablets through internet allow customers to conduct business online, transfer money, do purchasing, listen and watch music and videos online [27].

1.4.2 Technology Adoption-Mobile Banking technology

Zhou et al [28] defines mobile banking as the usage of mobile devices such as mobile phones, smartphones and personal digital assistants (PDAs) to access banking services through the wireless application protocol (WAP). Diniz, Porto de Albuquerque, and Cernev [29] defines mobile (phone) banking (also mentioned to as m-banking or m-commerce) as usage of mobile devices, personal digital assistants (PDAs), or other movable devices linked to telecom networks, to enable banking services like money transaction, remittances and additional financial services associated with user's (bank) accounts (Diniz, Porto de Albuquerque, and Cernev, [29], p. 5). International Telecommunications Union [30] argues that mobile payment includes customer, who makes payment for a product/service through mobile phones. Loretta Michaels, Forward, Dr. Allen L. Hammond [31] define mobile banking as providing services such as loans, retailing or transferring money from one account to another account. Various researchers have named the mobile banking services using different names. Some researchers only use terms mobile banking or mobile money [32,33] while others use both expressions to refer to same thing and others make clear differentiations in the terms. For example, one of the landmark researches on mobile banking by Donner and Tellez [32] assert that all these terms indicate towards "applications that enable people

to use their mobile telephones to manipulate their bank accounts, store value in accounts linked to their hand sets, transfer funds or even access credit or insurance products". In addition, the study refers to mobile banking as a "mobile phone application that allows the user to conduct financial services, mainly payments and transfers, in addition to the ability to store value." Mobile phones with increasingly advanced features are adopted by users universally at an unprecedented rate [34]. The growth in smartphones offering high internet speeds and quality like 3G (third generation) increased popularity and opened an alternate delivery channel for conducting financial transactions [35] for banks and financial providers.

This wireless mobile banking is the most recent innovations that provide pervasive and ubiquitous branchless banking service using mobile devices for conducting banking transactions without visiting the physical bank branch and even without using internet through wired mode (in certain cases). Being the progressive form of online banking, [36] mobile banking engages mobile devices to render financial services to consumers electronically. It is enunciated as an ingenious marketing and customer relationship management (CRM) tool for financial businesses. Mobile banking constructs resilient relations between financial institutions and the customers [37].

Even though financial transactions and money transfers worth of millions of dollars are conducted on daily basis universally, but these are mostly executed using credit cards, debit cards or cash [38]. The money transfer facility from mobile device to other mobile device or account is being used, in few developing countries like South Africa, Kenya then in the others [39].

Through wireless application protocol(WAP) and general packet radio service(GPRS) the customer has accessibility to extensive services such as money transfers between the accounts, stock trading and doing payments using mobile phones for buying things. It utilizes the existent infrastructure accessible via advanced technology. Using mobile banking, banking services such as account management, information inquiry, money transfer, and bill payment can be accessed.

Mobile banking (M banking) offers a distinctive value proposition to the users [41, 42, 43, 44] by means of channel of communication, rules and the device for accessibility in branch banking. For users the ubiquitous feature that allows user to access the service anytime and anywhere offers distinctive value. In other words, the value is extended by increasing the usability by removing temporal and spatial barrier [45,46]. Hence, mobile banking offers unique value proposition to customers by enabling conducting transactions anytime, anywhere without any barrier of time and place.

M banking also offers huge value to the individuals who are out of formal financial systems, who are having no bank accounts. It gives unique value of getting banked for those who are unbanked in addition to those who are banked by providing better and cost-effective alternative to outstrip the challenges of affordability and maintain minimum limits. So, in times of economic downturn, mobile banking technology offers progress by channeling the money effectively using technology. Another value offered by mobile banking is the service that is rendered especially to the bottom of pyramid segment to allow them conduct money exchanges and even storing money in form of value in their mobile phones (offered by some providers). The segment that has been out of any access of financial services can now easily avail these benefits and conveniently be connected and economically help boost the country's economic system. The new avenues are created by mobile banking in form of conversion of money in the form of value stored in the mobile phone (mobile number). The successful deployment of this model has been done in form of M-pesa services in Kenya. M-pesa has witnessed huge success particularly among the bottom of pyramid segment that were either unbanked or underbanked. So mobile banking is powerful mechanism that holds potential to provide financial access and financial inclusion in developing economies especially to the low-income segment of people globally [47].

1.5. Developing economies

Developing economies are the economies which are in process of development and growth. They have social or commercial activities in state of progression and industrialization. They are recognized by "less sophisticated institutional environment and the weak resource endowment of local firms" [48]. Developing economies possess high progress or progress potential but have lack of proper organized framework. They are typically identified by possessing limited advancements in technology and expertise. The major developing economies of the world characterize slow progressions in technical proficiency. Developing countries are considered as nations with low to middle per capita income. Akinwummi et al., [48] explains that these economies form nearly 80% of the worldwide population, embodying around 20% of the countries globally. Developing broadly refers to the nations that have paucity of industrial development, infrastructure, investments, innovative technologies, education and appropriate living standards overall. These nations are sometimes also called as "third world nations". As per classification of World Bank,

emerging economies are the nations having low or middle levels of Gross National Product (GNP) per capita.

Photograph 1.2-Map of Emerging Markets

The developed as well as developing economies both acknowledge that technology is pivotal in the economic growth and advancement of standard of life in the country. It is recognized as an agent of change in both developed as well as developing nations. Aleke et al. [50] advised that the developing nations are yet straining to come at pace with Information and communication technology (ICT) applications as compared to its significant adoption and use in the developed nations. The biggest economies comprise of India and China.

1.5.1 Technology adoption in developing economies

The adoption of technology varies with the development standing of the economy. If all other factors are kept constant, technology adoption in diverse economies may be dissimilar simply because the time taken to plan cycle is different; when the growth of a new technology is pretty definite, it may consequently have more different adoption patterns in different economic systems, whereas when uncertainty is high in new technology; the adoption in different economic systems may be more similar since adoption is mostly postponed by majority of the managers [51].

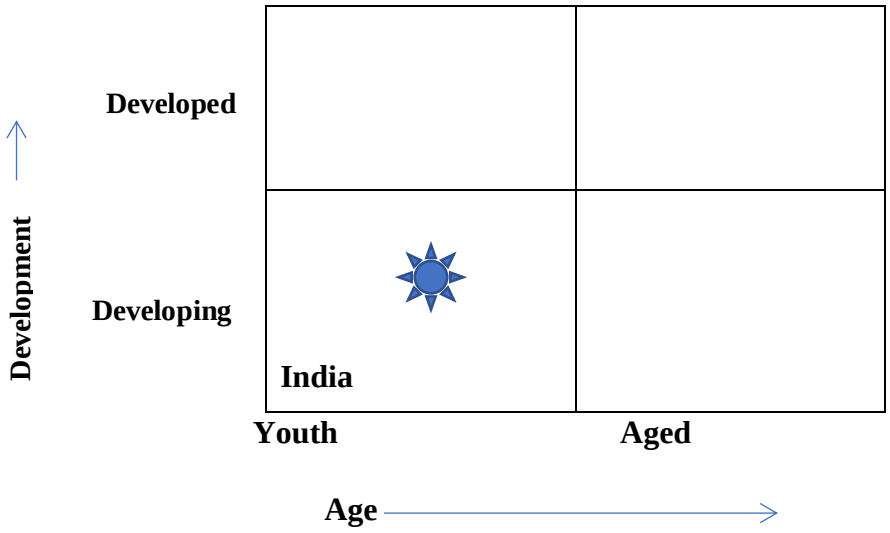


Figure 1.1: Adoption behavior in Developing Economy

Generally, the adoption studies are either based on the users or on the adoption environment, but the present study encapsulates both the user (Youth) and the environment (developing economy; access to mobile devices etc.) So above matrix could be utilized to explain the adoption behavior in the given developing economy context by the youth segment. Wright [52] advocates that new changes in the customary cultures and way of living happen most likely owing to enhancements in communications technologies. If the economy is developing, it will have high scarcity of resources and limited technological development. Moreover, Age is inversely related to the keenness to experiment and use of new innovations. As the age increases, the discretion towards new technology decreases. Youth is more technologically inclined and open towards acceptance of new technology acceptance and use as compared to older age segment. So, with more development in the economy and less age, the tendency for technology adoption should be high. Contemporary research suggests that in developing economies with constrained resources digital communication technologies play vital role in many emerging areas and enhancing the living standards [53]. The age, as well, also facilitates fast pace of adoption.

1.6 Youth

The definition of youth remains rather prototypical (such as Hassan and Katsanis [54]). It varies in diverse societies, though it has been given numerous names all of which represent towards this arguably homogeneous segment [55].

OECD [56] defines youth market as the individuals between the age group of 18 to 29 years. Gen Y, also called as echo boomers or millennials, usually contains people born in year 1980 and 1995 [57].

Youth are capable of playing a pivotal role in the socio-economic development and regeneration of the society. The techno savvy youth, who is at ease with latest trends and technology, bestows this knowledge and expertise in his area of work and to the people he works with, besides his family and friends. The extensive qualitative survey in Europe by Christensen [68] concluded that innovation and communication attract youth towards brands. Apparently, most of the researches on mobile devices are circled around youth, needless to say that this segment displays higher level of mobile usage. Various dynamics under examination include peer relations, social relations, self-identification, self-presentation, household life (such as researches by [69, 70,71,72]. The daily and their social lives of the young people are oriented towards the new media technologies like mobile phones, social networking sites etc. and media practices like instant messaging etc. [73,74]. Owing to customization and shrinking sizes of the media devices, youth continue to stay logged on systems, mobile phones and handheld devices [75]. The studies indicate the extent to which the mobile phones have become indispensable in modern life primarily for the youth. They are dwelling on the world of media that is totally digital [76]. They are the foremost ever-connected generation through their smart devices always with them [77].

The associations of youth and the mobile devices have rendered high level of similarities across multiple cultures [78,79]. Study by Rich Ling and BirgitteYttri highlighted the unique pattern of mobile use by Norwegian youths termed as “hyper-coordination.” Unlike the older age segments, youth displayed using their mobiles for emotional and social connects primarily to strengthen their peer relations. As compared to older age groups who experience stress using their mobile devices, the youth flourished on its accessibility and the interactions [78]. Delli Carpini, M. X. [80] study on American youth suggested that the growing access to technologies like internet and World Wide Web has influenced the dynamics of economic, social and political system. Though these changes impact all age segments but the youth has been quicker to adopt this technology.

Youth forms a unique segment entirely different from all other segments. For them mobile phones denote social and cultural significance besides old and customary practices of social acts. Hence

their associations with mobile phones require a different set of examination to understand how this technology and services offered by it are analyzed and interpreted by them. The facility of anytime anywhere banking and eliminating the need to queue up through e-banking is highly valued for its convenience by the youth [81]. McGovern [83] suggested that youth segment was relatively more positively inclined towards individual's attitude with respect to easiness of use, convenience and security as compared to other age segments. The people in older age groups are more averse towards technology use and need to be well persuaded about its worth whereas youth generally wonders why not to use it [83].

The accessibility and depth on information of youth is always higher than previous generations. Having that kind of accessibility on data and knowledge and possessing powerful data processors, their method to interact with information is distinct from prior generations. They have more variability, are high on skills rather than content and passionate for learning from lifetime experiences. Moreover, they grew up around computers, laptop and mobile gadgets; they possess higher disposable incomes as compared to their previous generations. Also, they have high spending powers and are highly influential on their parents spending as well [84].

Marketing professionals are vastly interested in these individuals because of their profile as change agents and who commonly encompass early adopters of new technologies (such as [85,86,87]. Kara, et. Al. [88] in their study on developing credit card strategies for youth suggested if card is issued to a youth there is high probability that the youth will stick with the same company for long. So evidently the providers initiate targeting youth to reap greater benefits [89].

This virtue has also attracted the researchers to understand this innovation inclined segment. In fact, youth has been placed in the core of various adoption related researches such as adoption of online banking, mobile banking etc. [90,91,92,93,94]

1.6.1 Values that drive Youth's needs and preferences

Young individuals are highly uncomfortable with complicated traditional bank offerings [95]. However, this segment is not demotivated by security concerns even though they have highest likelihood to experience breaches and frauds in comparison to other age segments [96]. Their

preference is price and product rather than the brand and has intensity to frequently change brands then sticking to just one even though they enjoy boasting their brand associations [97,98]. Youth is highly influential customer segment and adept to frequently changing mobile commerce industry [99].

With increase in purchasing power of youth, the customers spending is likely to increase up to four times to USD 4.2 trillion by 2017 more so in tier 2 and 3 regions [83]. The working Indian population (above 25 years of age) is estimated to rise from 40 per cent to 55-60% percentage of entire population up till 2020. In addition, with increase in acceptance of new services such as mobile wallets there is probability of 60 times growth in transaction volumes by 2020 [101].

1.6.2 Youth in India

The 2011 census survey of Indian populations states that 65 per cent of Indian citizens are under the age of 35 years and 47 per cent are under age of 20. As per the demographic data by International Labor Organization, India has the largest youth population in the world; around 66 per cent of the total population (more than 808 million) is below the age of 35[102].

So, evidently this segment is the emergent majority segment in India. The preferred device for this segment is the mobile device which is beholding exponential growth [103]. The Indian culture is unique. Study by Salman [106] indicated that a typical youth through internet is spending 3.2 hours a day on their mobile phones (approximately 22.4 hours or entire day per week. This segment is the most probable and promising segment to accept new ways of making purchases like mobile transactions and payments (11% of this age group is currently doing it on weekly basis) [106].
This significant level of youth population is big asset for India. Crabbe, M.et al [105] identified that younger, more educated males are more likely to be conditioned to experience new technology and services. Mobile banking technology is the most recent innovations and technological developments in India followed by smart phones. India is a progressively growing economy and mobile banking technology has started to grow in India over the last few years and has shown consistent increase.

Hence given the availability of technology, the youth being the early adopters possess the capability and skills to adopt the innovations and bring in radical change in the economics and culture of the nation including the developing economies.

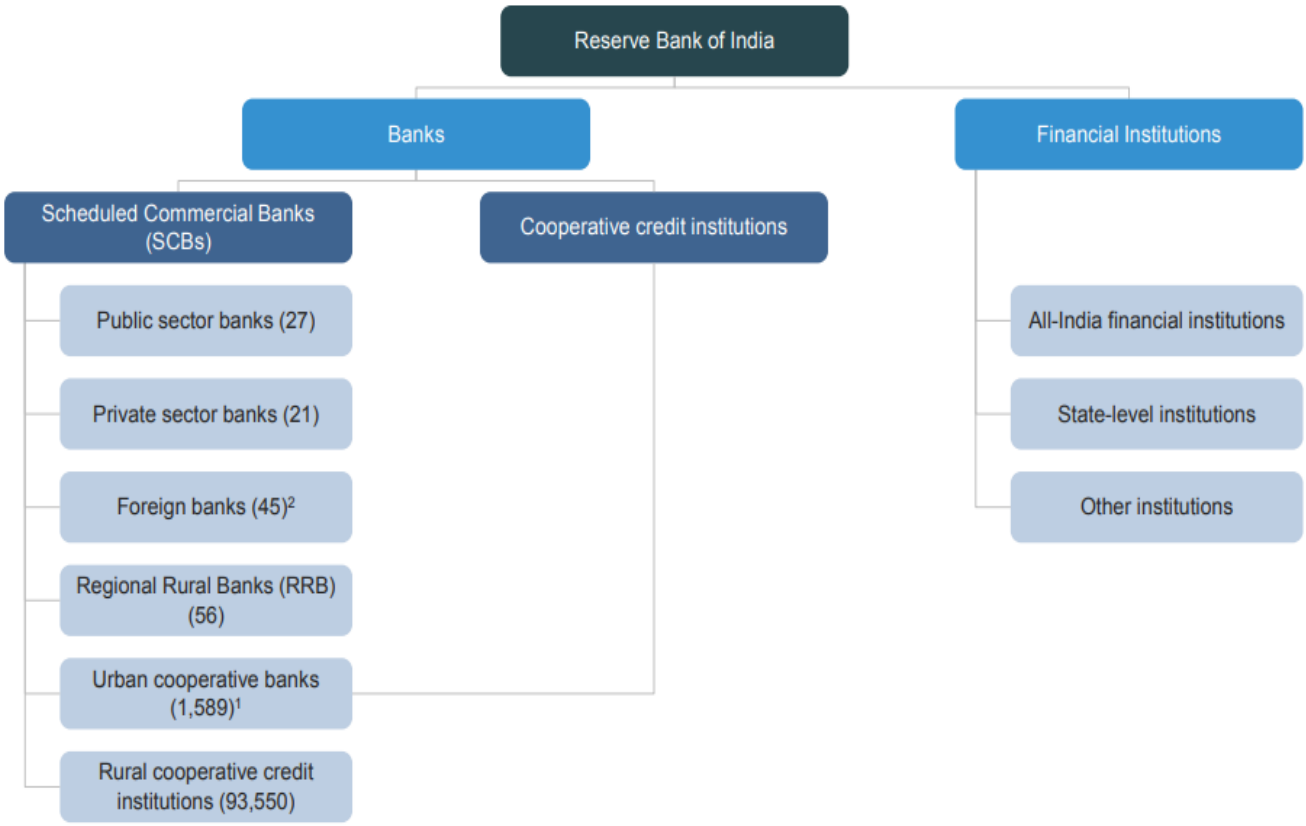
1.7 Indian Banking System

The banking sector in India is adequately capitalized and has proper regulations as per Reserve Bank of India (RBI). The state of economy and finance in the country are much better as compared to other countries [6].

Indian banking system is combination of diverse ownership groups that include public and private, and within private, domestic and foreign. The formulation of public sector banks in India happened in various phases. Indian banking system was formed in year 1947 (Kumbhakar, S., & Sarkar, S. [7]). State Bank of India, incepted as Imperial bank, was renamed in 1955 under the State Bank of India Act of 1955. Establishment of banks was later followed by nationalization of 14 private sector commercial banks in 1969 under the Nationalization Act of 1969. More nationalization of banks happened in 1980 during the second phase where 6 more private banks were nationalized. The existence of private and foreign banks was permitted along with public banks; however, their functions were greatly constrained through entry regulations and stringent system of issuing branch licenses [7].

Indian banking industry in recent years have observed major augmentation of technology innovations in banking models such as payments that are believed to bring new structure to this sector. The current market of India comprises of 27 nationalized banks, 26 private banks, 45 foreign banks, 56 regional rural banks, 1,574 urban cooperative banks and 93,913 rural cooperative banks, along with cooperative credit institutions. The nationalized banks represent over 70 per cent of the banking system assets, hence only a small chunk is left for the private players [6].

Figure 1.2: Structure of Indian Banking System:



Source- IBEF [6]

The customer of banking services in these recent years has developed into more aware and selective individuals. A higher inclination towards banks offering more innovative and cost-effective products/services has emerged strongly.

Electronic-banking (e-banking), whether used through online or mobile mode, has presently become extremely popular.

Interestingly the use of e-banking is not restricted only to big corporate houses and developed countries; but the emerging economies are also leveraging this technology for their better growth and convenience. Since e-banking is cost efficient having low processing fees for the providers and less searching and switch costs for the users, they can be profitably targeted even to the low-income remote areas. This progressive trend has speeded in India as well [8]. Also, with the thin banking coverage (0.12 branches per thousand adults) the increasing demand for banking and financial services, could not be met only through bank branches, hence newer methods and channels are required to cater the humungous demand for banking and financial [9]. Banks continue to urge people to use mobile phones for management of their banking and finances [6].

Electronic banking technologies have grown and spread rapidly in recent years and its extensive range of products and services has led to increasing customer attention. These technologies include debit cards, ATM banking, computer banking and mobile banking. The financial providers including banks and other institutions have invested heftily in terms of time and resources to develop and implement these technologies since they are highly promising in terms of generating efficiencies, cost effectiveness and luring new customers. The customers are driven towards these technologies by virtue of their conveniences, growing ease of use and in certain settings, cost efficiencies (Hogarth and Anguelov [10]). Electronic banking, particularly mobile banking, has witnessed an encouraging rate of growth. There are some indications that electronic banking is associated range of advantages such as support in better household financial management [10].

In spite of this substantial proliferation of digital payment services, recent research has established that major chunk of Indian population still prefers to conduct transactions in cash mode and carry money transfers through bank branches. Agwu et al [11] study determined that users are contented with short message service (SMS) received regarding any form of transactions in their bank accounts. So, they do not find value in m-banking.

The factors that influence such attitude of people towards mobile banking remain unidentified and hence leave a big gap towards understanding of this phenomenon. Adoption is an individual based phenomenon and depends on the individual's psyche, perceptions and beliefs whether or not he/she intends to adopt a technology. So how does individuals perceive about adopting certain technology

that decides his usage and continuance willingness needs to be researched to garner deeper understanding and insight.

An advanced wave in mobile payments has started to make the conditions for a significant change worldwide and specifically in Indian economy, which is relied upon to surpass 7 percent development in 2020. However, for such development to be really comprehensive independent companies and shoppers must turn out to be full members in this change [12]. Yuwa Hedrick-Wong [12] suggested that "the issue of going digital and inclusive is currently not about the absence of items or thoughts or models, or considerably client readiness or capacity, it is tied in with doing the diligent work of enlisting a huge number of little vendors and having help lines to hold the hands of the huge number of customers who won't be technically knowledgeable but rather who need to get on board." Hence though an effort has been made to drive digital banking and payments, however there exist many lacunas that need to be addressed to ensure individual initiative towards adopting this mobile banking service [12].

It is seemingly important for the m-banking services providers to gain a clear understanding of m-banking adoption specifically amongst the youth who are generally considered to be early adopters of innovative technologies.

1.8 Statement of the Problem

Mobile banking is a fairly new phenomenon and extent of research on this topic and the study of factors that determine its adoption have largely been confined more to developed countries. Hurley, R.F. and Hult, G.T.M. [13] in their study on innovations in the emerging economies highlighted on the necessity to examine the adoption of mobile banking and user behavior in the emerging economies. It is observed in general that people have begun to have positive inclinations towards mobile banking, but could this lead to adoption in Indian context?

This area has not garnered much attention so far and there is dearth of empirical work on understanding the underlying factors that may lead to the adoption of mobile banking in India. If the marketer and financial service providers are aware of these factors, it can be of humongous

help to them and to the country as a whole. This could aid effective understanding of customers, their expectations and preferences. It could orient the providers towards the focus areas of the service as well as help them in designing and delivery of proper services, product design and channels. Hence this research intends to bridge this gap and develop a framework that deepens the understanding of the concept and its application by the practitioner.

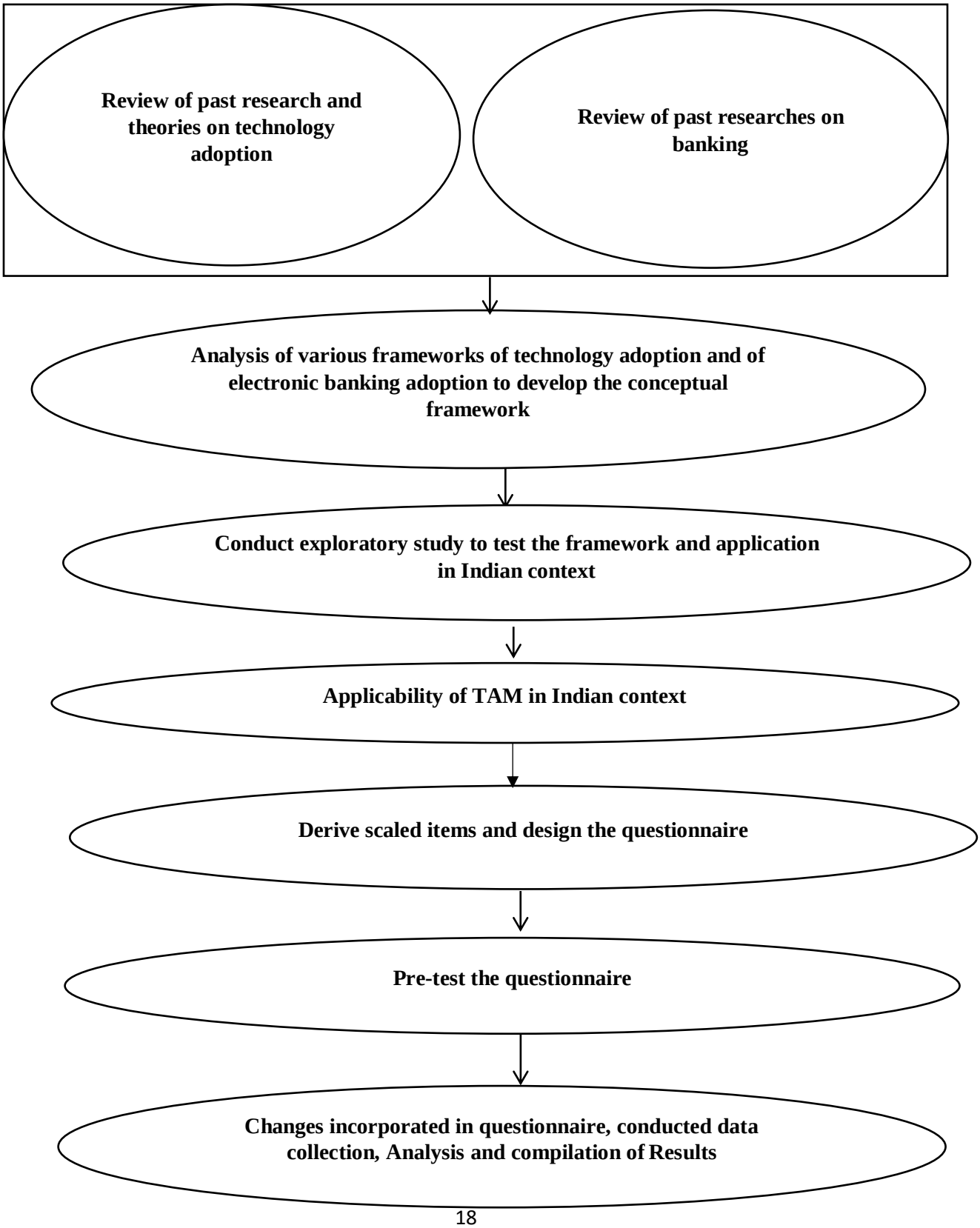
1.8.1 Research Objectives

The primary objective of this study is to identify the factors that determine mobile banking adoption.

Further, the study seeks:

- To investigate the adoption of mobile banking in the Indian context.
- To ascertain the demographic factors that influence the decision to use mobile banking in Indian Youth
- To evaluate whether the TAM model provides a solid theoretical basis for examining the adoption of mobile banking in the Indian context.

Figure 1.3 Structure of the Research



1.8.3 Theoretical Rationale for the Study

India is an emerging economy with largest youth population in the world. With introduction of mobile banking technology, the economy operating in scarcity of advancements is more probable to recognize the resource and facility obtainable that caters to their unmet needs. It is considered more than likely for such economy to adopt and use this technology. Moreover, the largest youth composition who are pro-technology and naturally attracted to new technologies are expected to be the foremost adopters of this new innovation. But surprisingly, being in emerging economies with largest youth segment, the adoption of this technology is very low. So, it is crucial to understand the factors which influence the people to adopt this technology in Indian context. Hence the present study explores the factors that influence intention to adopt mobile banking technology in India.

To understand the phenomena, technology acceptance model (TAM) is used. TAM model has been successfully used in past across various technologies to explain the end user's perception towards the adoption. Since mobile banking is an individual level adoption and depends on the end user's perception so TAM is incorporated to explain mobile banking adoption. This research will enhance the understanding of the factors that influence the adoption of mobile banking and will contribute to the existing body of knowledge on mobile banking adoption.

1.8.4 Contribution of this research work

There are multiple dimensions of mobile banking services. But there is lack of research that provides clear understanding on factors that trigger the adoption of banking using mobile phones in India. One of the important contributions of this research work is analysis of roles of different factors influencing mobile banking adoption with respect to Indian market.

Moreover, this study can be great use for the upcoming providers with new business models who plan to install and deliver these services such as payment banks, and support other prevailing participants in the ecosystem like telecommunication providers, mobile network operators and banks, in establishing and sustaining infrastructure for providing m-banking services.

1.8.5 Significance of the Study

The outcome of the present research work is anticipated to enhance the current understanding of mobile banking by contributing towards the existent literature on the said area and in the context of emerging economies. To be precise, it will bridge the existing gap in India by being the starting point for further future studies. The findings from this research may also be used by practitioners to design, improvise and customize mobile banking services and could also assist in their further decision making. For academicians, this study could provide basis of academic reference for further research.

1.9 Structure of the Thesis

This thesis is comprising of five chapters.

Chapter one contains introduction, explains the youth and youth behavior in general, discusses on the aspects of adoption, technology adoption and youth behavior towards adoption of new technologies. It discusses the research purpose, research objective; significance of the study and the research methodology.

Chapter two explains mobile banking adoption and demonetization in India

Chapter three contains the literature review that discusses mobile banking in developing countries and in India. It reviews theories on mobile banking adoption which serves as a basis for the research framework. Further description of major constructs in the proposed framework is provided

Chapter four explains the research methodology, the research methods used and the reasons for using them.

Chapter five discusses the results of the research conducted

Chapter six contains the analysis and the interpretation of data. It goes further to compare the findings of the present research with the past. It further contains the summary, conclusions, managerial and theoretical implications of the study, limitations and future directions are presented.

Chapter 2

Mobile banking adoption and Demonetization in India

2.0 Chapter Introduction

The chapter discusses adoption of mobile banking in developing economies, mobile banking in India and trends in the mobile banking adoption before and after demonetization. The chapter explains the effect demonetization made on the uptake of mobile banking.

2.1 Adoption of Mobile banking in Developing economies

M- banking has been adopted and is successful in many emerging economies of the world. In Kenya, M-banking became successful in 2007 through introduction of Mpesa by Safari.com, the biggest telco service provider. The inception of Mpesa was primarily done to allow the payments of loans of micro financers which can be done using mobile phones, but it was extended in transferring money between the bank accounts, bill payments, salary payment etc. as well.

In Uganda, owing to ill developed network and poor living situations, there was lack of financial access even though there were 30 banks, the people served were lower than 10 per cent. So, the needs for financial access and less banking diffusion lead to MTN Uganda emergence, which was dominant telecom provider. In partnership with Fundamo, MTN Uganda introduced Mobile Money in 2009 similar to Mpesa in Kenya. So, a strong and simple to use service was created that generated 1 million registered users in 1 year (nearly 16 percent of its consumers). The representatives of Mobile Money used to travel throughout the nation, creating awareness about the product. It was applauded by the government and the citizens for creating jobs for the jobless young segment in the nation [106]. Likewise, many developing countries including Nigeria [392], Ghana [26], South Africa [393], Brazil [394] embraced mobile banking for inclusive growth.

Philippines (an archipelago consisting 7100 islands) having no or minimal accessibility to financial services witnessed the need by people in 1998 to capitalize on the feature of transferring airtime loads amongst each other [310]. Soon enough, in December 2003, the biggest telecommunication provider in the Philippines, understood the power of this technology and started “PasaLoad”, that made possible the electronic transference of airtime between the users. Following the league, 50

different telecommunication providers worldwide provided Domestic Airtime Transfer, and 30 provided merchant payment service, and in United States as well. This exemplified the value this technology offered to the countries worldwide by virtue of bringing radical change and economic welfare [391].

2.2 Mobile banking in India

Mobile banking in India has been offered by the majority of commercial and leading urban cooperative banks. Though it had just taken off in past few years. The service culminated with offering basic account specific information to its consumers initially on their mobile handsets which later developed to a level of providing financial transactions and remittances services. Presently the technology has advanced up to a level offering transfer and payments services to the customers even to those who do not have bank accounts. IMPS (Immediate Payment Service) in 2010 have been responsible for development of m-banking in India. IMPS was built by National Payments Corporation of India (NPCI) to enable real time inter-bank transfers through mobile phones. By means of IMPS, users can remit money across several mobile banking medium for instance SMS, USSD, IVRS and mobile internet (GPRS) [106].

Triggered by exponential telco growth, the government and other key societal members have been considering the development of individuals through mobile services. Specifically, focusing on socio-economic influence on the individuals who are poor and underprivileged [32]. This outlook holds stronger grounds and realism by seemingly growing number of people having mobile services as compared to banking services [26].

Also, the presence of current commercial bank branches in Indian villages is 600000 in India that forms merely 5 per cent of the entire population. Out of this population, the proportion of youth having bank accounts is 40 per cent. For this underserved segment of population, mobile banking is the technology service that promises the financial inclusion. In addition, it also offers the most cost-effective mechanism of conducting banking transactions.

Soaring rural tele density open avenues for mobile banking (Million Units) in India as shown in the Figure 2.1

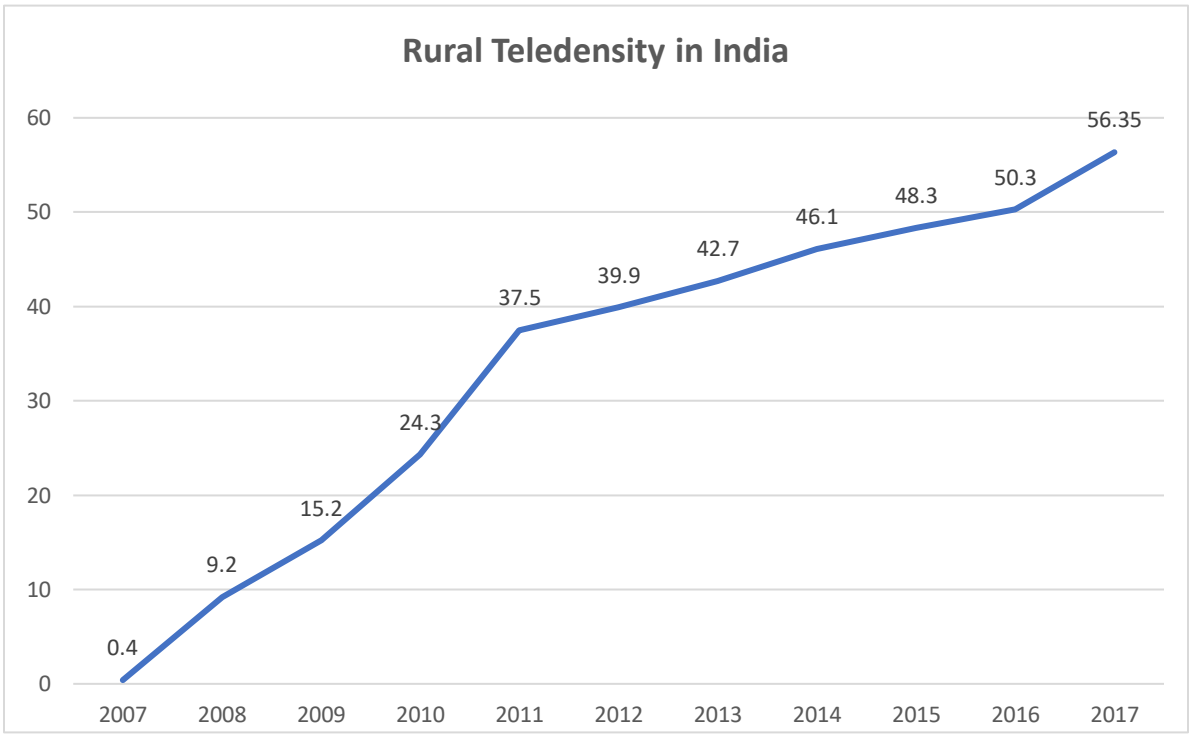
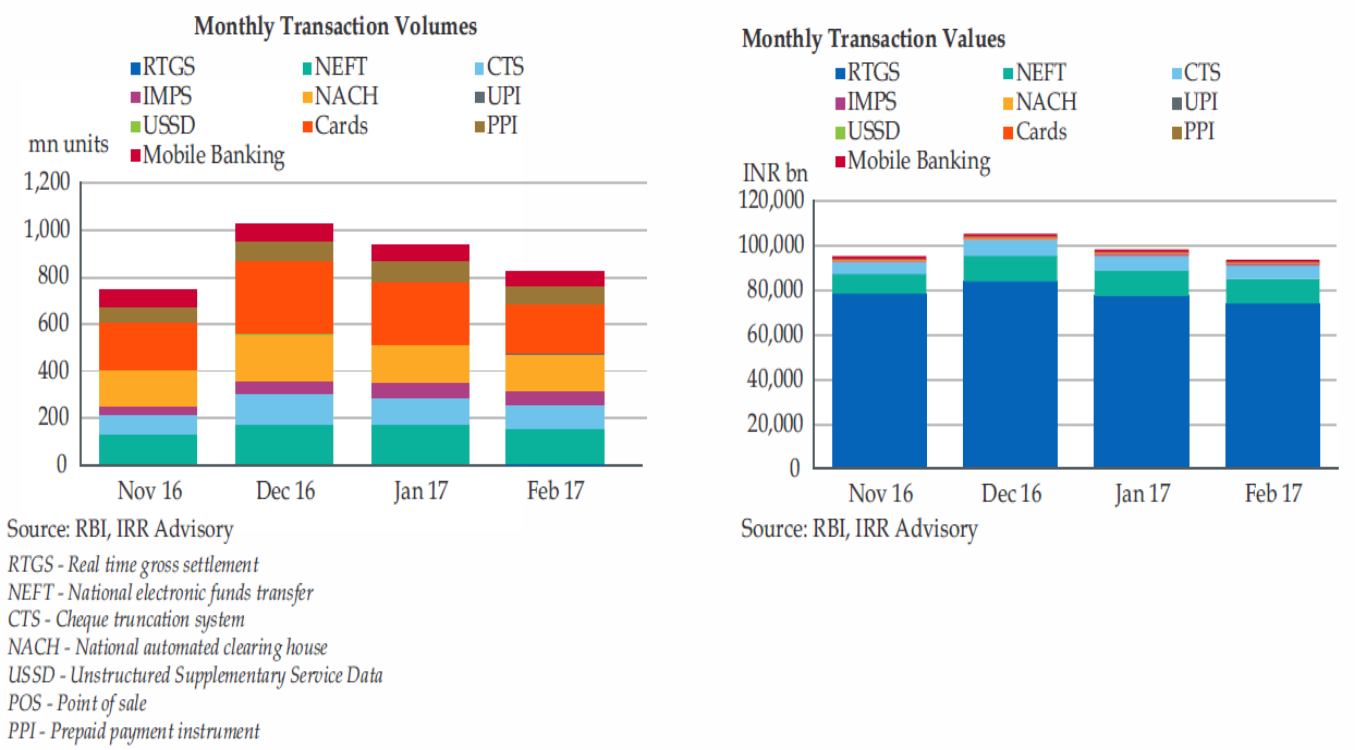


Figure 2.1 -Rural tele density in India **Source-** IBEF [108]

- Tele-density in rural India soared at a Compound Annual Growth Rate (CAGR) 64 per cent during 2007 to 2017
- Banks, telecom providers and RBI are making efforts to make inroads into the un-banked rural India through mobile banking solutions

2.3 Adoption of Mobile banking in India

With reference to adoption of mobile banking, India is placed at the 4th position worldwide [108].



Photograph 2.1 Modes of payments since November'16 - the volume and value of various types of transactions

The photograph 2.1 shows that 9.7 per cent of total transactions by volume were conducted through mobile banking in Nov 16 that shows a drop to 6.9 per cent in the next 3 months. The value of transaction through mobile banking showed a continuum between 1.2 and 1.3 per cent of total transactions.

2.4 Mobile banking Trends:

The trends for mobile banking as per the financial year are shown in the Table 2.1 below:

		April				
Month/Year	**Item**	**2015**	**2016**	**2017**	**% Change 2017 / 2016**	**% Change 2016 / 2015**
Volume (Million)	Mobile Banking	**19.75**	**48.67**	**106.18**	118.2	146.4
Value (Rupees Billion)		**188.62**	**524.83**	**1,612.17**	207.2	178.3

Table 2.1: The trends for mobile banking as per the financial year

Source- www.rbi.co.in [111]

The trends in banking industry in mobile banking transactions in year 2016 and impact of demonetization on the transactions.

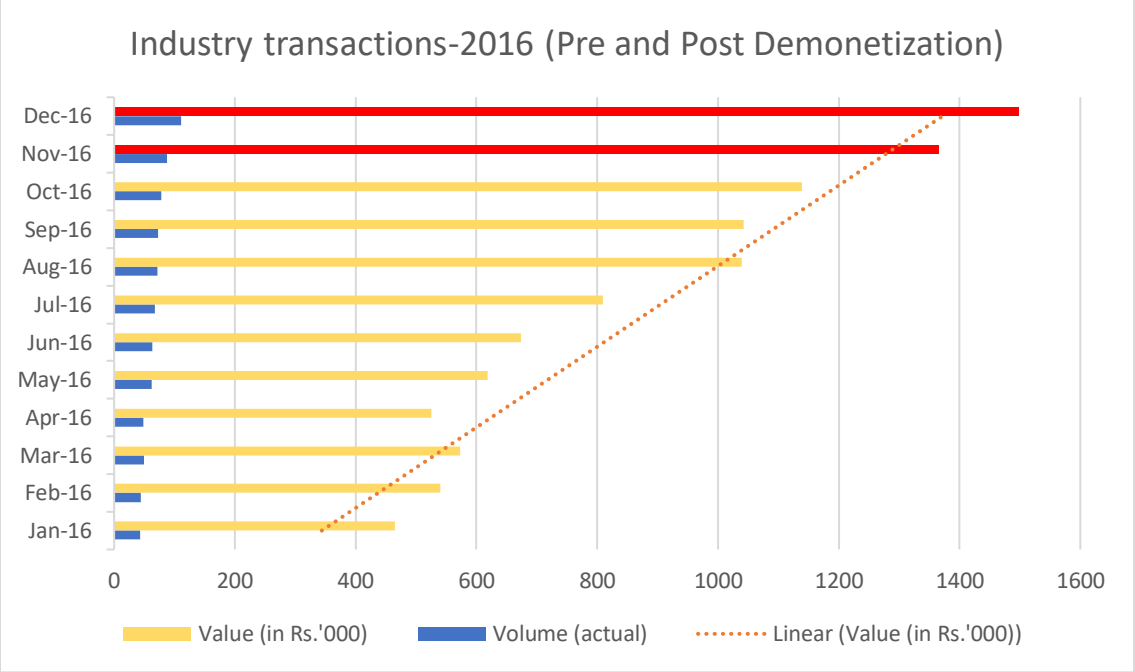


Figure 2.2: Industry transactions 2016 (Pre and Post Demonetization)

Source- www.rbi.co.in [111]

It is evident from the table above that though the impact of demonetization was huge, the adoption prior showed highly positive and progressive result. In other words, the individual adoption rates

were on a growth trajectory and increasingly growing even without the government mandate (Pre-demonetization).

2.5 Mobile banking Trends of India's Top Banks in India:

Table-2.2

State Bank of India	2,109,791,.7
HDFC Bank Limited	816,024.60
ICICI Bank Limited	736,607.60
Axis Bank Limited	562,334.70
Punjab National Bank	562,273.60

Table 2.2: Mobile banking Trends of India's Top Banks in India

(Source: Dun and Bradstreet [112])

The trends projected by the top most banks in terms of mobile banking growth depict a positive rise and growth trend. The top 5 banks in India as per Dun and Bradstreet [112] report on basis of income are shown in the table 2.2 above.

Mobile banking transactions trends bank-wise (top 5 banks):

	Volume (Actual)		
Bank Name	**2016 (Average)**	**2017(Average)**	**2018(Jan)**
AXIS BANK LTD	8561684	16926492	27433165
HDFC BANK LTD.	16019920	25759609.33	3942605
ICICI BANK LTD	9831305	17541292.58	20915173
PUNJAB NATIONAL BANK	318870	780297.6667	644372
STATE BANK OF INDIA	11986113	24024445.25	41921361
Total	46717891.33	85032136.83	94856676

Table 2.3: Mobile banking transactions Volume bank-wise (top 5 banks)

Source- www.rbi.co.in [111]

	Value (In Rs'000)		
Bank Name	**2016 (Average)**	**2017(Average)**	**2018(Jan)**
AXIS BANK LTD	83476450	108696819.9	193315044.3
HDFC BANK LTD.	127775785	132027988.3	53129553.35
ICICI BANK LTD	168992402	268611840.5	192233782.8
PUNJAB NATIONAL BANK	5221689	5699687.059	5765136.034
STATE BANK OF INDIA	194482975	250824878.9	189281649.4
Total	579949300	765861215	633725166

Table 2.4: Mobile Banking Transactions Value Bank-Wise (Top 5 Banks)

Source- www.rbi.co.in [111]

The both volume and value transaction tables 2.3 and 2.4 depict the gradual increase in the uptake and use of mobile banking post demonetization phase across the years in the top 5 banks. Hence the initiative taken by the government did show a positive consequence and carved an encouraging image of future progression in India. However, the effort so taken was implication on users to adopt the technology as mandated by the government. Hence the adoption decision instead of being a user's preference and inclination for use was rather a mandated decision. So, it is not considered as part of this present research as current study is inclined towards understanding the factors that influence the beliefs of the individual towards adoption of mobile banking technology.

2.6 Mobile banking transaction trends Year-wise:

Going from year 2016 to 2017, all the banks demonstrated increasing trend in mobile banking transactions. Amongst all banks, HDFC bank showed highest number of mobile banking transactions. On the contrary, from year 2017 to Jan 2018, HDFC exhibited downturn in the mobile banking transaction volume as compared to increasing trend showed by all other banks where State Bank of India stood at the top with respect to mobile banking transaction value, Axis bank demonstrated an increasing trend from 2016 to 2018. Rest of the banks grew from 2016 to

2017 in terms of mobile banking transaction, however they showed gradual decline from 2017 to Jan 2018.

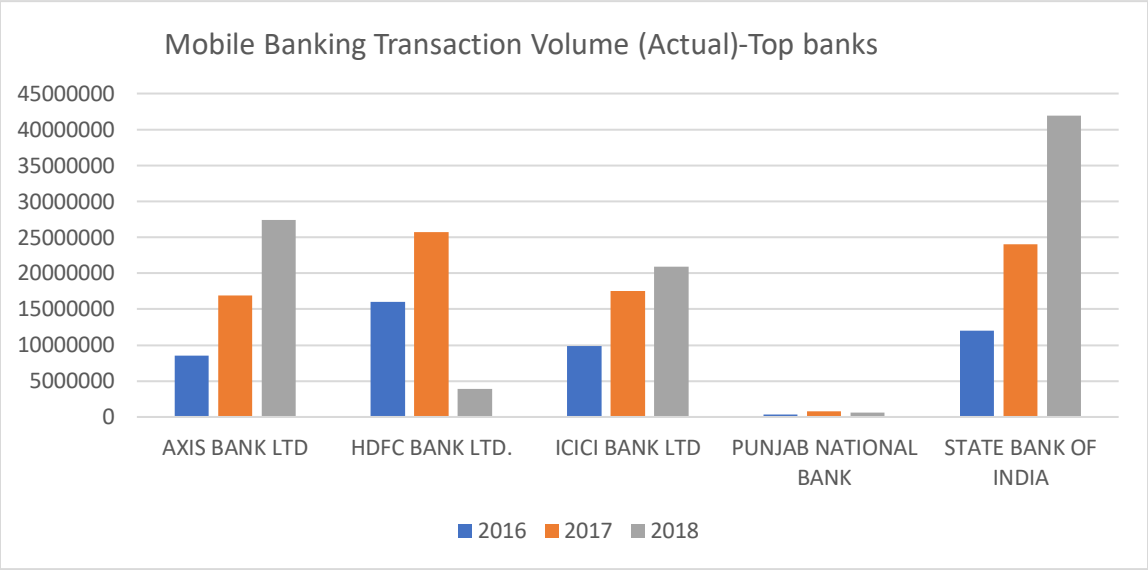


Figure 2.3: Mobile Banking Transactions Volume Bank-Wise (Top 5 Banks)

Source- www.rbi.co.in [111]

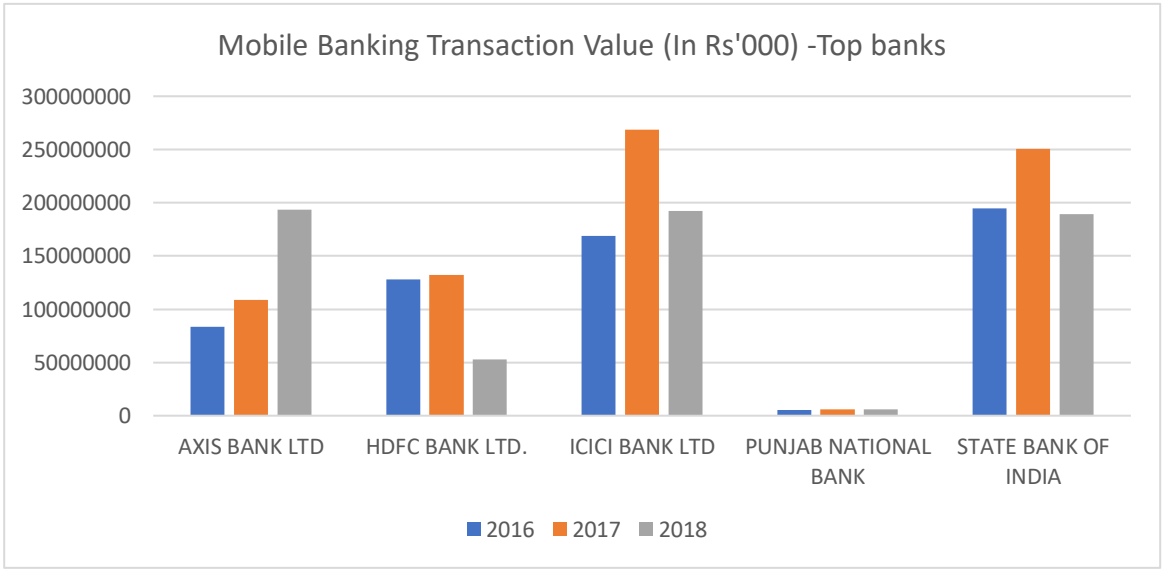


Figure 2.4: Mobile Banking Transactions Value Bank-Wise (Top 5 Banks)

Source- www.rbi.co.in [111]

2.7 Demonetization and its effects- Digital Transformation of Payment systems in India:

Acknowledging the prevailing trends in financial and technology trends worldwide, Indian banking and financial landscape underwent massive dramatic change in Nov 2016 creating new roadmaps towards making India being a less cash carry culture.
The major initiatives that remodeled the Indian digital economy were: –

- **New policies by GOI and RBI** – "The demonetization of 500 and 1,000-rupee notes in November 2016, and subsequently range of new policies by GOI and RBI to promote digital payments were dictated. To facilitate this, the major actionable included expanding existent infrastructure of digital payments both from the provider's end (merchants) and user end (by expanding coverage in the rural areas). There were benefits offered to people conducting digital payments including petrol pumps, toll plazas, booking railways tickets etc. Also, to curb cash transactions, a bound of 3 lakh rupees was imposed. Besides the regulations on pre-paid instruments (PPIs) were relaxed. The payments conducted through IMPS, UPI and USSD mode were charged relatively less. Also, a new offline app for digital payments, BHIM was launched and along with Bharat QR codes" [111].

- **Focus and establishment of national payment infrastructure by NPCI:** "Under payment infrastructure umbrella various products/services were launched such as BHIM/UPI, BBPS, AEPS, Bharat QR code, USSD, IMPS. Also, futuristic measures included focus towards making various payment mechanisms interoperable and capable of offering multiple functions, support multiple devices and serve being multipurpose. More initiatives included building of national broadband highway under Digital India initiative that cover 250,000-gram panchayats by using national optical fiber network (NOFN) and urban coverage using the virtual network operators (VNO) to support the delivery and communications" [111].

- **Fresh players in Financial Services Industry**: The Indian finance service backdrop include lot of diversity with creation of payment banks, small financing banking institutions and FinTechs that may facilitate deeper coverage and higher inclusive society including farmers,

individuals managing minor savings, lower and middle-income families, small and medium enterprise (SMEs), and the migrant workers remitting money back home [111].

- **Adoption by individuals and small traders:** All these initiatives have led to around1 billion mobile connections (where one third is expected as the mobile internet users in 2017) and 2.6 million point of sale (POS) establishments [111].

2.8 Chapter Conclusion:

The chapter discussed adoption of mobile banking in developing economies, mobile banking in India and the trends in the mobile banking adoption before and after demonetization. The chapter outlined the effect demonetization produced on the uptake of mobile banking. The immediate effect of demonetization was on the value and volume of transactions conducted by the users post November 2016(demonetization).

Chapter 3

Literature Review

3.0 Chapter Introduction

This chapter contains the literature review that discusses mobile banking in developing countries and in India. It reviews theories on mobile banking adoption which serves as a basis for the research framework. Further description of major constructs is provided.

3.1 Technology adoption

Tan and Teo [115] found that banking has always been a highly information intensive activity that relies heavily on information technology (IT) to acquire, process, and deliver the information to all relevant users. Not only is IT critical in the processing of information, it also provides a way for the banks to differentiate their products and services. Banks feel that they need to constantly innovate and update to retain their demanding and discerning customers and to provide convenient, reliable, and expedient services. Driven by the challenge to expand and capture a larger share of the banking market, some banks invest in more bricks and mortar to enlarge their geographical market coverage. Others have considered a more revolutionary approach to deliver their banking services via a new medium: The Internet.

Au and Kauffman [114] based on their research advocated that economics of technology adoption and diffusion show considerable evidence on the positive impact of IT adoption and investment on firm performance. The use of IT has resulted in substantial long-term productivity gains. However, there might be a significant lag between initial adoption and widespread diffusion of a technology within an organization, and the related impacts. The evidence shows, however, that stakeholders to technology adoption (including consumers, corporate buyers, selling intermediaries and government agencies) do not always reach a consensus about the value of technological innovations.

Gikandi and Bloor [116] study revealed that competitive forces are motivators of adoption of technology in banking. Banking is suitable to electronic channels where banking facilities are easily digitized.

Hwang et al. [115] concluded that e-banking provides faster and cheaper services to the customers. Moreover, in Kenya as is the case in most other developing economies, e-banking facilities have enabled banks to expand their geographical coverage even in the areas where they do not have branches by forging alliances with other banks and mobile phone providers and allowing them to serve their customers through their partnership thus enhancing customer services.

Tan and Teo [115] said that financial institutions that failed to respond to the need for electronic banking services would likely lose more than 10% of their customer base.

Luo et al [118] reiterated that while technologies, such as 2.5G (i.e. GPRS), 2.75G (i.e. EDGE), and 3G wireless networks that support faster and easier access to the Internet, have become increasingly ubiquitous and thereby changed consumers' behavioral patterns in interacting with their financial institutions. Consumers are more technologically savvy than ever, which has reduced their uneasiness involving technological innovation. With the infusion of innovative technologies in the financial services sector, the rapid spread of internet-enabled mobile phones and PDAs has made the transformation of banking applications to mobile devices a logical evolution of electronic banking.

Brown et al. [119] said that from their cell phone, customers are able to access their accounts in order to check account balances, make transfers, pay bills, and perform various other transactions This innovation follows the relatively successful introduction of internet banking, whereby customers can access their bank accounts, through the bank’s web site. The number of internet users is nevertheless small in comparison to the 13 million cell phone subscribers. Thus, the cell phone network is the most likely platform for valued-added services, such as online banking and mobile commerce offerings to reach critical mass. However, worldwide, fewer than 3 per cent of cell phone users having internet-enabled phones who actually use them for banking. Mobile access to the internet has been a non-starter, which implies cell phone banking too has not been widely adopted.

Lin [120] claimed that mobile banking services provide customer value creation due to being inherently time and place independent, as well as their effort-saving qualities. Innovation diffusion theory posits that perceived innovation attributes (like relative advantage in innovation theory) influence individual usage of an innovation. Technological innovations have been studied using this perspective. Mobile banking may have new features (such as ubiquity, flexibility and mobility) compared to conventional banking channels (e.g., automated teller machine, phone-banking, no n-mobile Internet banking), however, the effects of innovation attributes deserve attention and have not been fully understood in the adoption of mobile banking.

3.1.1 Mobile Banking Technology Adoption

Suoranta and Matila [119] advocate mobile banking allows users to check account balances, make inquiries on transaction history, transfer funds, pay bills, do trading of stock and manage asset portfolio.

The study by Nandhi [122] to explore the everyday use and effects of EKO (a partnership between the financial services startup company EKO and the State Bank of India (SBI)) mobile banking in Delhi brought forth that EKO mobile banking service is valued as a boon for small savers and users who depended on risky informal savings practices. Major reason for use of this mobile banking option was found to be a means to save for emergencies. The EKO services were found to be easier and more accessible in making payments and deposits and EKO mobile money accounts too appeared to improve efficiency and regularity of other savings mechanisms. Hence the technology has already knocked and is trying to make its way out in India.

Yu [123] highlighted that despite many wireless commercial services increase quickly, the use of mobile banking service is much lower than expected and still underused and the market of mobile banking still remains very small in comparison to the whole banking transactions.

That is, the widespread adoption and high usage of cell phones did not reflect on the adoption and usage of mobile banking, although mobile banking perhaps was the first commercial mobile service and first introduced in the early 2000s through short messaging service and wireless access protocol. Considering the immense penetration of cell phones, banks have very large potential to

offer mobile banking services to people living in remote villages where only few computers are connected to the Internet. Study suggested that the emerging mobile banking may give banks a good commercial opportunity of providing their services to rural people who are unable to access the internet.

Wu and Wang [124] discussed that the advances in modern electronic commerce, including advertising, shopping, investing, banking and other online services (e-mail, information seeking, etc.) have made it possible for people to interact with the internet in their daily lives. The number of internet users has therefore continued to increase. Such internet use will facilitate mobile commerce (MC) development and applications. As with ''Electronic'' business, ''Mobile'' business will experience increased transactions and probably increase profits and revenues. Yet, limited understanding of the customers' urgent demands and lack of technological infrastructure will remain impediments to MC success. With accelerated business competition and the popularity of internet and mobile device use, there is an urgent need to understand the factors that would entice users to use MC. Hence, the study adopted the extended technology acceptance model (TAM2), integrated with the innovation diffusion theory (IDT), perceived risk, and cost and validated the factors that determine consumer MC acceptance

Lin [120] claimed that mobile banking services provide customers value creation due to being inherently time and place independent, as well as their effort-saving qualities. Innovation diffusion theory posits that perceived innovation attributes (like relative advantage in innovation theory) influence individual usage of an innovation. Technological innovations have been studied using this perspective mobile banking may have new features (such as ubiquity, flexibility and mobility) compared to conventional banking channels (e.g., automated teller machine, phone-banking, non-mobile Internet banking), however, the effects of innovation attributes deserve attention have not been fully understood in the adoption of mobile banking.

Donner and Tellez [32] suggested that scholarly research on the adoption and socioeconomic impacts of m-banking/m payments systems in the developing world is scarce [32]. Even less attention has been paid to the social, economic, and cultural contexts surrounding the use of these systems. For users in the developing world, the appeal of m-banking/m-payments systems may be less about convenience and more about accessibility and affordability [124,125].

Brown et. Al [117] used a statistical model combining elements of the theories of diffusion of innovation (Roger [21]) and of planned behavior [126] to predict mobile banking take-up in South Africa, finding high levels of perceived risk to be a major barrier to further adoption. To date, it is one of the few evaluations of m-banking/m-payments system in the developing world explicitly applying a theoretical lens. Two studies from the economic development/practitioner literature Ivatury and Pickens [129]; Porteous [130] suggested that mobile banking users in South Africa are wealthier and better educated than the average South African with a bank account, let alone the average unbanked South African.

Crabbe et al [26] discussed the impact of cultural differences between countries on the effectiveness and efficiency of IT deployment. There are concerns that behavioral models do not hold true across cultures. One of the problems in relation to assessing the relevance of culture is that culture is a macro-level phenomenon and often lacks precision in relation to explaining behavior at the individual level. Although technology adoption studies have been a consistent theme within information systems research there is still uncertainty as to whether the reasons for technology adoption at the individual level are different to the reasons for organizational adoption of technology.

Crabbe et al [26] examined the reasons for the adoption and non-adoption of mobile banking in Ghana. Through a survey of 271 people in Ghana, it was being found that social and cultural factors in the form of perceived credibility, facilitating conditions, perceived elitisation and demographic factors do play a significant role in adoption decisions. It was found that elitisation of technology and services can be a positive influence for adopters whilst being a negative influence for non-adopters. In addition, perceived credibility and facilitating conditions also influence attitudes towards the technology. When these factors are added to a range of demographic factors, the impact of the social and cultural features of the context of studies can be seen as significant.

Brown et al [117] study examined the factors that influence the adoption of cell phone banking in South Africa, as a means of understanding how to possibly increase the rate of adoption. A framework developed in Singapore identifying the factors influencing the adoption of internet banking was used as a basis and amended to assess cell phone banking. Factors identified as

influencers included relative advantage, trialability, and consumer banking needs, with perceived risk having a major negative influence.

Wu and Wang [124] study presents an extended technology acceptance model (TAM) that integrated innovation diffusion theory, perceived risk and cost into the TAM to investigate what determines user mobile commerce (MC) acceptance. The proposed model was empirically tested using data collected from a survey of MC consumers. The structural equation modeling technique was used to evaluate the causal model and confirmatory factor analysis was performed to examine the reliability and validity of the measurement model. Their findings indicated that all variables except perceived ease of use significantly affected users' behavioral intent. Among them, the compatibility had the most significant influence and the positive influence of perceived risk on behavioral intention to use.

Donner and Tellez [32] on basis of exploratory work with small enterprises in urban India, it argued that contextual research is a critical input to effective "adoption" or "impact" research. Further, it suggested that the challenges of linking studies of use to those of adoption and impact reflect established dynamics within the Information and Communication Technologies and Development (ICTD) research community. The paper identified three crosscutting themes from the broader literature—amplification vs. change, simultaneous causality, and a multidimensional definition of trust—each of which can offer increased theoretical clarity to future research on m-banking/m-payments systems.

Laforet and Li [131] examined the demographic, attitudinal and behavioral characteristics of online and mobile bank users. Respondents from six major Chinese cities participated in the consumer survey. The results showed Chinese online and mobile bank users were predominantly males, not necessarily young and highly educated, in contrast with the electronic bank users in the West. The issue of security was found to be the most important factor that motivated Chinese consumer adoption of online banking. Main barriers to online banking were the perception of risks, computer and technological skills and Chinese traditional cash-carry banking culture. The barriers to mobile banking adoption were lack of awareness and understanding of the benefits provided by mobile banking.

Gerpott, T. J., and Kornmeier, K. [132] explored drivers of mobile payment services (MPS) acceptance among mobile communications customers. Using survey data from 347 residential cell phone users in Germany and the Partial Least Squares modeling approach found that breadth of MPS use situations, MPS risk assessment and MPS evaluations by social reference groups were important (indirect) determinants of behavioral intentions concerning future MPS adoption.

Hanafizadeh et al [133] study provided insights into factors affecting the adoption of mobile banking in Iran. The study built a comprehensive theoretical model explaining mobile banking adoption. By incorporating 361 bank clients in Iran, eight latent variables of perceived usefulness, perceived ease of use, need for interaction, perceived risk, perceived cost, compatibility with life style, perceived credibility and trust were examined. It was found that these constructs successfully explained adoption of mobile banking among Iranian clients. Adaptation with life style and trust were found to be the most significant antecedents explaining the adoption of mobile banking.

Daud et al [134] examined critical success factors that influence the adoption of mobile banking in Malaysia using extended Technology Acceptance Model (TAM). The proposed model was empirically evaluated by using survey data collected from 300 banking users concerning their perceptions of mobile banking. The findings indicated that this model can predict consumer intention to use mobile banking. Specifically, perceived usefulness, perceived credibility and awareness about mobile banking have significant effect on user's attitude thus influence the intention toward mobile banking. The questionnaires were distributed to a targeted population of 11 commercial banks in Kuala Lumpur. About 330 questionnaires were distributed to the respondents at 11 commercial banks in Kuala Lumpur and 323 questionnaires were returned. 300 of the returned questionnaires were completed and usable. Study concluded that three variables namely perceived usefulness, perceived credibility and awareness were found to be significant factors of intention to adopt mobile banking. Perceived ease of use and perceived risk were not significant. The introduction of additional significant variables (Perceived credibility, perceived risk and awareness) made new extended TAM model a comprehensive model in evaluating the factors that influence the intention to adopt mobile banking in Malaysia.

Study by Lin [120] used innovation diffusion theory and knowledge-based trust literature. This study developed a research model to examine the effect of innovation attributes (perceived relative advantage, ease of use and compatibility) and knowledge-based trust (perceived

competence, benevolence and integrity) on attitude and behavioral intention about adopting (or continuing to use) mobile banking across potential and repeat customers. Based on survey in Taiwan of 368 participants (177 for potential customers and 191 for repeat customers), this study used a structural equation modeling approach to investigate the research model. The results indicated that perceived relative advantage, ease of use, compatibility, competence and integrity significantly influenced attitude, which in turn lead to behavioral intention to adopt (or continue-to-use) mobile banking. Additionally, by using multi-group analysis with t-statistics, the results found that the antecedents of attitude toward mobile banking differ between potential and repeat customers.

Yu [123] summarized mobile banking studies and proposed that TAM, TPB/DTPB and IDT were frequently employed to investigate what influences mobile banking adoption, while small number of studies utilized other theories such as Mean-end theory, Rasch measurement model and Item response theory, and Analytical hierarchy process to derive core determinants to explain the adoption of mobile banking.

Wentzel et al [135] emphasized on explanation power of TAM reiterating that it has established over time as the most powerful technology adoption model in the field in various studies including Venkatesh and Morris [137], Venkatesh et.al [138] etc. As Initially projected, TAM model has received significant support in the field of information technology acceptance and has established as a robust, as well as parsimonious model in elucidation of user adoption and usage behavior in various studies including lgbaria et al, [136]; Venkatesh and Morris [137], Venkatesh et al [138] etc.

TAM has been studied by researchers to find its usability past its initial use such as in study by Henderson and Divett [139] applicability of TAM was researched in an electronic commerce background. The outcomes directed that TAM could be effectively applied to e-commerce. The study by Zhang and Prybutok [140] focused on consumers' online purchase intention and established the validity of TAM in an online shopping environment, while McCloskey [141] applied TAM to electronic commerce participation and validated its applicability. Amin [91] investigated the factors influencing online banking acceptance in Malaysia and Rigopoulos. These studies confirmed the applicability of TAM in predicting online banking adoption.

There have been various additions that researchers have made to explain adoption of e-commerce and related technology enabled services by extending TAM. The authors specifically focused on TAM and the adoption of e-commerce. Trust as a construct was investigated by Pavlou [142], Gefen [143] and McCloskey [141]. These researchers found that a consumers' intentions to transact using e-commerce depend both on trust and the two beliefs identified by TAM, PU and PEOU [133] As technology has advanced and consumers adopt services such as online banking and e-commerce, trust related constructs were found to directly influence adoption intention in the users.

Bandyopadhyay and Katherine [144] suggested that social influence based in culture would provide additional explanatory power concerning consumers' intention to use a technology. Social norms and social risks [37] were found to influence the intention to adopt as was social influences [144].

The adoption of technological products and services has often been explained by the TAM (Davis [146]). This model has also been applied for understanding the adoption of mobile services (see Kwon and Chidambaram [147]; Lee et al. [148]. The TAM model focuses on the attitudinal explanations of intention to use a specific technology or a service. Moreover, a study reported by Kwon and Chidambaram [147] suggested that TAM should be extended to include variables related to social pressure when explaining consumers' use of mobile services. The TRA [161] includes the concept of normative pressure and has often been used to explain behavior beyond the adoption of technology. The TRA model included four general concepts; behavioral attitudes, normative pressure (subjective norm), intention to use and actual use. The inclusion of normative pressure represented important addition when compared to TAM. From TRA, normative pressure can be included in theoretical model explaining consumers' use of mobile services to fill the gap related to effects of social pressure mentioned by Kwon and Chidambaram [147].

Early studies on adoption of mobile banking have been very narrow and limited especially in the Indian context. Various factors have been taken and tested to identify the framework of

technology adoption by users. Researchers globally have been trying to develop understanding of adoption patterns of internet, electronic and mobile banking adoption.

According to study by Wu and Wang [124] perceived risk, cost, compatibility, and perceived usefulness significantly effect adoption and use of mobile commerce. Table 3.1 highlights some researches carried out to identify the factors of mobile banking adoption in various cultures and backgrounds.

Table 3.1- Empirical and theory-based empirical researches in technology and mobile banking adoption

Author	**Theory**	**Construct**	**Application**
Taylor And Todd [128]	TAM and TPB (Name Combined TAM-TPB)	PU, PEOU	IS/IT System Adoption
Van Der Heijden [186]	Modified Technology Acceptance Model	Perceived Entertainment Value and Perceived Presentation Attractiveness	Individual Acceptance and Usage of The Website
Chau And Hu [186]	Compared Three Models- Technology Acceptance Model (TAM), The Theory of Planned Behavior (TPB), And Decomposed TPB Model	Compared the theories	Healthcare Professional Setting
Chau And Hu [187]	Modified Technology Acceptance Model	Peer Influence	Healthcare Professional Setting
Venkatesh Et Al. [138]	Unified Theory of Acceptance and Use of Technology	Review User Acceptance Literature and Discuss Eight Prominent Models	Understanding the organizational outcomes associated with

			new technology use
Lin Et Al. [188]	TRAM (Integration of Technology Readiness and Technology Acceptance Model)	TAM and Technology Readiness Construct	Understand Technology Adoption in situations where adoption is not mandated by organizational objectives
Agarwal And Prasad [149, 150]	Field study on adoption of information technology adoption	Personal Innovativeness	Information Technology innovation (expert systems application)
Dishaw And Strong [190]	Integrated Technology Acceptance Model with Task-Technology Fit	TAM and Technology Fit constructs	Understanding on software utilization for better understanding of choices about using IT
Agarwal And Karahanna [190]	Modified Technology Acceptance Model	Cognitive Absorption, Playfulness and Self-Efficacy	Understand reasons why users behave in particular ways toward information technologies (World Wide

			Web)
Venkatesh And Davis [184]	Technology Acceptance Model	Social Influence Processes (Subjective Norm, Voluntariness, And Image) And Cognitive Instrumental Processes (Job Relevance, Output Quality, Result Demonstrability)	User Adoption Behavior
Moon and Kim [191]	Technology Acceptance Model	Playfulness	World-Wide-Web
Pavlou [142]	Extended Technology Acceptance Model	Trust and Perceived Risk	Acceptance of E-Commerce
Gefen Et Al. [193]	Technology Acceptance Model	Trust	Online Commerce
Pikkarainen Et Al. [194]	Technology Acceptance Model	TAM in online environment	Acceptance Online Banking in Finland
Chiu Et Al. [195]	Technology Acceptance Model	Personal Innovativeness	
Wu And Chen [196]	Extension of Trust and TAM model with TPB	TAM and Trust, TPB	on-line tax
Walczuch Et Al. [197]	Technology Acceptance Model and technology readiness index (TRI)	TAM and Technology Readiness traits	Understand relationship of personality and technology acceptance
Chen Et Al. [201]	Technology Acceptance Model, And Theory of Planned Behavior	Technology Readiness	

Lee [170]	Technology Acceptance Model with Theory of Planned Behavior	Perceived Risk and Perceived Benefit	Adoption of Internet Banking.
Chen And Chen [198]	Extended Technology Acceptance Model		Automotive Telematics Users' Usage Intention
Stern Et Al. [199]	Extended Technology Acceptance Model		Consumers' Acceptance of Online Auctions
Serenko Et Al. [200]	Extended Technology Acceptance Model		User Acceptance of Interface Agents in Daily Work Applications
Chen Et Al. [201]	Technology Acceptance Model, Theory of Planned Behavior, And Technology Readiness		Adoption of Self-Service Technologies
Ervasti And Helaakoski [202]	Model Based on TAM And TPB		Mobile Service Adoption
Shafeek [203]	TAM		Acceptance of eLearning Systems By Teachers

Table 3.1- Empirical and theory-based empirical researches in technology and mobile banking adoption

3.2 Technology Adoption Models

3.2.1 The Theory of Reasoned Action (TRA)

The Theory of Reasoned Action was formulated in 1967 and subsequently extended in 1970s by Ajzen and Fishbein. The theory postulates that the individual beliefs influence his attitude towards the given technology [148,149]. "The intention which the individual holds before the actual behavior is referred to the behavioral intention of a person and this could be defined as a measure of one's intention to perform the given behavior. It suggests that the behavior of an individual is the outcome of the attitude towards that behavior and the social norms." Ajzen and Fishbein [151]. TRA provides understanding of associations between intentions as the mediating variable in the actions and the attitudes [151].

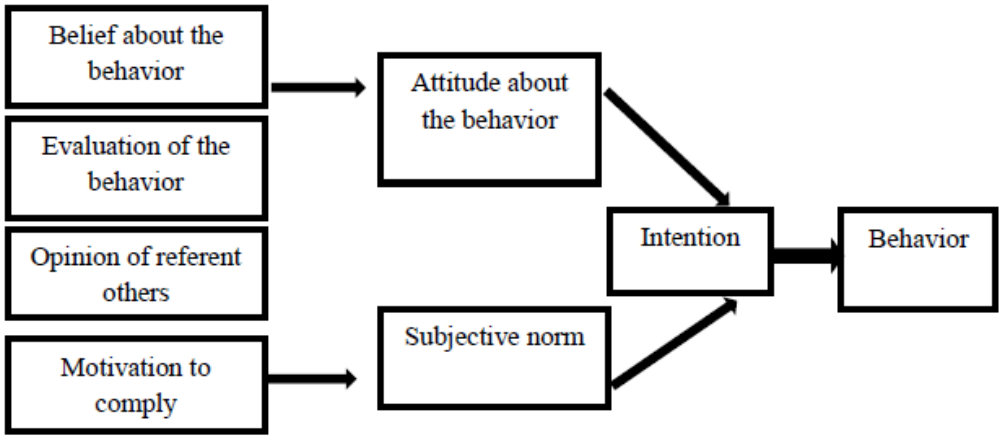


Figure 3.1: Theory of reasoned action

Source: Fishben and Ajzen [161,150]

The TRA theory suffered some limitations however such as, the identification of the differences between the user's intention and his behavior. This was a big challenge because the user's behavior maybe function of some other variables along with his intention to determine the behavior. Moreover, in the event of non-performance of certain behavior, it is happening because of the behavior of the user or his intention was also not explained by TRA [152].

3.2.2 The Theory of Planned Behavior (TPB)

The Theory of Planned Behaviour (TPB) attempted to resolve the limitations of TRA. Theory of reasoned action (TRA) was extended by Ajzen [154] called as the theory of planned behavior (TPB). Theory of Planned Behavior came as the extended version of theory of reasoned action (TRA) to eliminate the limitations of TRA. TPB has additional construct perceived behavioral control along with attitude and subjective norms in TRA to explain the behavioral intentions which comprise the individual's actual behavior [154]. The theory suggests that perceived behavioral control identifies the individual's self-ability and intention to exhibit specific behavior [189]. Ajzen & Fishbein [151] defined attitude towards behavior as "a person's general feeling of favorableness and un-favorableness for that behavior". Subjective norm was defined as "person's perception that most people who are important to him/her think he/she should or should not perform the behavior in question" [151]. The attitude was determined by the user belief's pertaining to expectations regarding the outcome and assessment of outcomes.

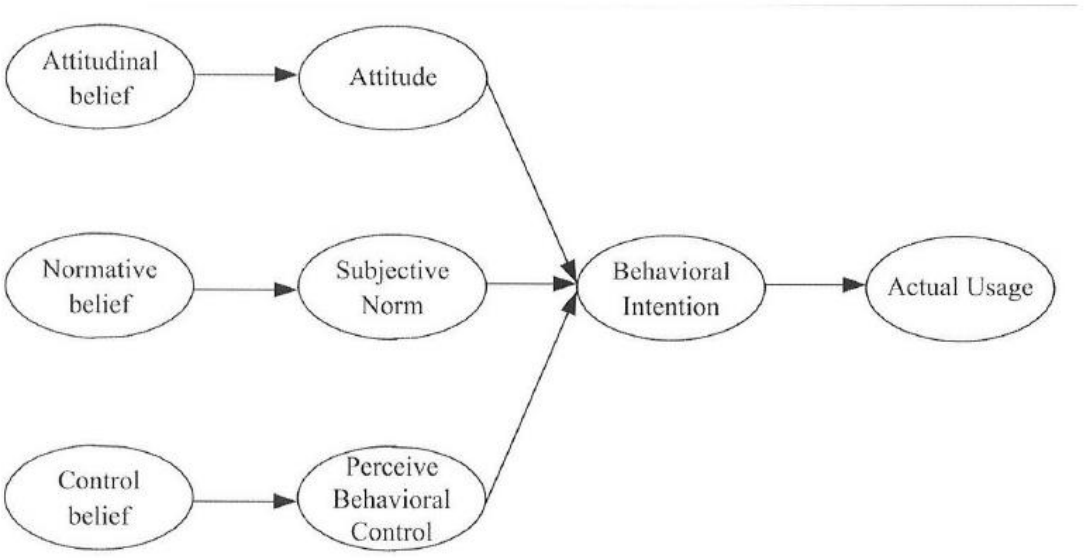


Figure 3.2: Theory of Planned Behavior

Major enhancement of TPB from TRA is addition of PBC which determines behavioral intention, and control beliefs which impact PBC. It may not be possible to measure the control beliefs but individual's belief about the difficulty or easiness of execution of a specific behavior may be identified. PBC is determined by control beliefs and perceived facilitation. The Control beliefs were defined by Ajzen and Madden [156] as the "perceptions of presence or absence of

requisite resources and opportunities to perform the behavior". Perceived Facilitation is "one's assessment of the importance of those resources to the achievement of the outcomes" [156]. TPB has invariably been applied in various settings with great success such as determining individual's intention to use a software [157], intention to do breast self-examination [158], intention for avoidance of caffeine [159] all of which found that TPB showed better predictive power as compared to TRA.

However, the belief constructs used in TPB were situation specific. The beliefs that hold good in one situation may not apply in same ways in another situation. Hence that limits the degree of its generalizability. Moreover, its application in different contexts is complex and therefore requires a pilot study to identify the appropriate outcomes, reference groups, and control variables in each situation it is applied. So, for different set of reference groups the same tools may not apply and require different ones. For example, use of computer aided learning might be for knowledge enhancement for students whereas instructors may visualize it to provide time efficiency. Also, it was argued that social variables are essential in case they explain variance which is not already explained by other constructs in the model [156].

3.2.3 Decomposed Theory of Planned Behavior (DTPB)

The Decomposed theory of planned behavior was proposed by Taylor and Todd [128]. Taylor and Taylor [128] stated that a better comprehension of association of belief factors and determinants of intention requires decomposition of attitude beliefs. DTPB explored the dimensions attitude belief, subjective norm (i.e., social influence) and perceived behavioral control by decomposing them into specific belief dimensions [128]. The attitudinal belief constructs were decomposed into three factors: perceived usefulness (PU), perceived ease of use (PEOU), and compatibility as they were found consistently associated especially to IT usage [158].

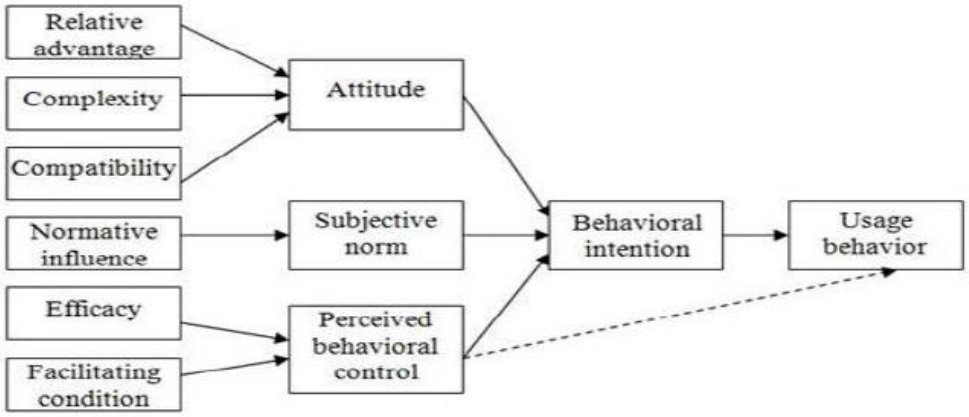


Figure 3.3: Decomposed theory of planned behavior

Source: Adapted from Taylor and Todd [128]

The DTPB suggested that behavioral intention was the primary direct determinant of behavior, nevertheless, the original three core constructs still exist: attitude toward behavior (ATB), subjective norm (SN), and perceived behavioral control (PBC) as first introduced in TPB.

Taylor and Taylor [128] showed that decomposed TRA possessed better predicting power then original TRA and TPB. Taylor and Taylor [128] asserted that subjective norms were functions of normative beliefs and need no further decomposition. The PBC was constituted by two elements, facilitating conditions and self-efficacy. Facilitating conditions as explained by the triandis model proposed in 1979 was the availability of the resources required to perform specific behavior that may be in terms of money, time or any other resources. So, if the technology aid is suitably available, the banking through mobile devices would become more possible. Self-efficacy, given by Ajzen [154], was the confidence of a competence to perform successfully in a given situation. Hence a user with confidence on his capability to use a mobile internet and banking is more probable to adopt it.

However, the study by Davis, Bagozzi and Warshaw[161] elucidated that social norm scales possess weak psychometric standpoint, and may not exert any influence on BI, specifically in cases of IS applications being fairly personal and individual use is voluntary.

3.2.4 Technology Acceptance Model (TAM)

TAM model was proposed by Davis in 1989 to explain the acceptance of individuals towards specific information technology. It was adapted from the theory of reasoned action (TRA) given by Fishbein and Ajzen [162] to describe and determine individual's behavior in a particular situation. TAM postulated that adoption of new IS/IT can be determined through behavioral intention (BI), attitude towards use (A), and two internal beliefs factors: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness was defined by Davis [146] as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context" (p. 985) and perceived ease of use was "the degree to which the prospective user expects the target system to be free of effort" (p. 985). TAM suggested that perceived ease of use (perceived ease of use), and perceived usefulness (PU) are the two most important factors in explaining system use. TAM variables, attitude towards use and intention to use were same as in TRA but it excluded the variable subjective norm (SN) that was present in TRA on the assumption that SN has minimal impact on BI [162]. TAM, however, has been revised and in TAM2 by Venkatesh and Davis [184] additional factors were included including social influence such as "social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use)" (p.187).

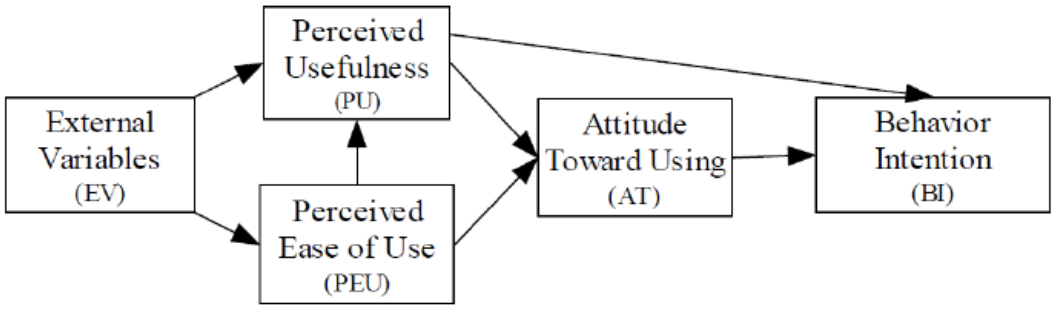


Figure 3.4: Technology Acceptance Model

Source: Davis [146,165]

PU was an outcome expectancy construct that determined the extrinsic motivation. TAM has stressed on the prominence of PU (over Perceived ease of use) as key construct of adoption. The

impact of perceived ease of use (Peou) in initial phases of learning and use of technology has direct and less intense affect (via PU) and with further experience strong and indirect affect. TAM proposed that Perceived ease of use influenced BI to adopt directly and indirectly through PU. Although TAM has been authenticated in various field settings it was usually been tested using students in several studies including [160, 126, 165]. In contradiction to prior TAM studies, the empirical evidence has supported that Perceived ease of use can be significant factor that influenced acceptance more than PU in positive and enjoyous training atmosphere for users gone through game centered training. "Perceived ease of use is the extent to which a person believes that using a technology will be free of effort" [146]. As Perceived ease of use was contemplated in terms of efforts so the user evaluated the procedure of system use thereby providing process expectancy". PU whereas was defined as "the extent to which a person believes that using a technology will enhance her/his productivity" [146] and therefore it was "outcome expectancy". Perceived ease of use influenced PU as more the user found a given technology easier to use more would he find it useful for him [165]. As per TAM model, intention (BI) described the actual usage of specific IS/IT and hence measured adoption of technology. Attitude towards usage and perceived usefulness together affect BI. BI was also influenced by perceived ease of use indirectly. Perceived ease of use and PU influence attitude towards use and Perceived ease of use directly influenced PU.

TAM has been invariably applied and tested with diverse sample size, types of users, by applying various statistical methods, various technologies and matched with other similar models. More than 100 research work have been conducted by incorporating TAM during the years 1989 and 2001 [46, 166, 167]. It is still a powerful model applied in range of settings like wireless LAN use Yoon and Kim [169], acceptance of online banking [169] and attitude toward self-service technologies [170, 171]. Hence even though TAM initially proposed to predict IT/IS system usage, the TAM factors can also be used to predict user adoption in diverse situations [171]. In previous years TAM has been validated in various technologies including spreadsheet [172, 73, 174, 156] and e-mail [172, 175]. TAM has been proclaimed by Davis et al. [161] as a simple and highly powerful model that predicts user's adoption of information technology as compared to TRA even though it had only two constructs Perceived Usefulness and Perceived ease of use. TAM was said to be strong, powerful and parsimonious model by Venkatesh [166] which predicts user adoption.

Mathieson [157] explored the TAM applicability and advocated that it can be used to determine contentment among various types of users having different preferences [177].

3.2.5 External variables

"TAM conceptualizes that Perceived Usefulness and Perceived ease of use were influenced by external variables and they mediated the impact of external variables on individual's attitude and BI, thereby usage of IS/IT" Saleh Alharbi and Steve Drew [178]. A vital goal of TAM was to offer a base to observe the influence of external variables on internal beliefs, attitudes, and intentions. TRA and TAM suggested that the external variables act in an indirect manner, influencing perceived ease of use and PU in TAM model. TAM theory proposed that the intervention of external variables was indirect and they impact perceived ease of use and PU. These variables had full mediation effect from PU and Perceived ease of use and they enabled enhanced understanding of aspects that influence PU and Perceived ease of use. The existence of external variables provided guidance regarding the things needed to motivate a higher usage [163].

3.3 Comparison of Adoption Theories

With reference to the IS literature, TRA, TPB, TAM and their extended adaptation models were popularly known technology acceptance theories and are widely used worldwide in diverse settings. The adaptation of TRA model has been done extensively in diverse areas and been used far and wide in research and a business domain [178] especially in IS field [179]. However, TRA was associated with some shortcomings such as there is risk of overlapping of attitude construct and social norms construct as attitudes could also be reframed as social norms and vice versa. Moreover, the formation of intention to act is recognized as an unconstrained variable where there might be constraints attached regarding individual's abilities, time, organization or environment specific constraints etc.

TRA model had some limitations including a significant risk of confounding between attitudes and norms since attitudes can often be reframed as norms and vice versa. Another limitation was the assumption that when someone forms an intention to act, they will be free to act without limitation. In practice, constraints such as limited ability, time, environmental or organizational limits, and unconscious habits would limit the freedom to act. However, there was also a growing

recognition that additional explanatory variables were needed for TRA to enhance its explanatory power [180, 181,182].

The Theory of Planned Behavior (TPB) attempted to resolve the limitations of TRA and provided explicit theoretical basis for many studies over various contextual settings. Therefore, DTPB must provide a more complete understanding of technology usage [126]. But, Davis et al. [161] explained that social norm scales had a very poor psychometric standpoint, and may not exert any influence on BI, especially when IS applications were fairly personal and individual usage was voluntary.

Generally, Technology Acceptance Model (TAM) specified general determinants of individual technology acceptance and therefore could be and have been applied to explain or predict individual behaviors across a broad range of end user computing technologies and user groups [161]. Simultaneously TAM compared favorably with TRA and TPB in parsimonious capability [179]. However, TAM was easier to use than TPB, and provided a quick and inexpensive way of gathering.

TAM model incorporated constructs which were general determinants of adoption of technology therefore was capable and was used in wide ranging application for prediction of adoption behavior towards various technologies and users [161]. Besides this, the TAM model was as good as TRA and TPB in its parsimonious capability [180]. In fact, using TAM was relatively easier than TPB and it allowed fast and economical method to collect data pertaining to the individual's opinions towards a technology. TAM has been said to be a very useful model [162]. King and He [185] in their meta-analysis study on TAM with 88 published studies found TAM to be a valid and highly robust model.

TAM was based on Theory of Reasoned Action, but unlike TRA TAM constituted of two factors perceived usefulness and perceived ease of use. In addition, unlike TRA TAM did not have subjective norm as antecedent of intention. These theories, though used diverse factors to predict the behavior, they shared many similarities. They all were based on explaining the association between attitude, intention and behavior. As compared to TRA, TAM proposed that the belief constructs had direct impact on the intention rather than mediated as stated in TRA.

Davis et al. [161] asserted that the cognitive beliefs influence a person through their beliefs that their performance would get enhanced on performing that behavior therefore influenced intention towards that behavior whatsoever emotions may accrue for that behavior. So, TAM advocated that people form intentions on basis of beliefs that it will enhance their work. Unlike TRA, TAM did not have subjective norms. Davis [146] explained that it was hard to separate direct influence of subjective norm on intention from indirect influence of attitude.

Venkatesh and Davis [184] p. 187 held that Davis [146] did recognize the necessity to "examine conditions and mechanisms governing the impact of social influences on usage behavior". As compared to TPB, TAM was easier to use and provided quick and inexpensive means to gather general information regarding an individual's perception of a technology [182].

Past researches have validated that TAM explained more variance as compared to other models TRA, TPB, decomposed TPB in adoption of systems [148]. The table 3.2 below shows the studies that incorporate TAM model and extensions of TAM in various studies.

Author	**Theory**	**Construct**	**Application**
Taylor And Todd [128]	TAM and TPB	PU, PEOU	IS/IT System Adoption
Van Der Heijden [186]	Modified Technology Acceptance Model	Perceived Entertainment Value and Perceived Presentation Attractiveness	Individual Acceptance and Usage of The Website
Chau And Hu [186]	Compared three models Technology Acceptance Model (TAM), The Theory of Planned Behavior (TPB), and Decomposed TPB Model	Compared the theories	Healthcare Professional Setting
Chau And Hu	Modified Technology Acceptance	Peer Influence	Healthcare

[187]	Model		Professional Setting
Venkatesh Et Al. [138]	Unified Theory of Acceptance and Use of Technology	Review User Acceptance Literature and discuss eight prominent models	Understanding the organizational outcomes associated with new technology use
Lin Et Al. [188]	TRAM (Integration of Technology Readiness and Technology Acceptance Model)	TAM and Technology Readiness Construct	Understand technology adoption in situations where adoption is not mandated by organizational objectives
Dishaw And Strong [189]	Integrated Technology Acceptance Model with Task-Technology Fit	TAM and Technology Fit constructs	Understanding on software utilization for better understanding of choices about using IT
Agarwal And Karahanna [190]	Modified Technology Acceptance Model	Cognitive Absorption, Playfulness and Self-Efficacy	Understand reasons why users behave in particular ways toward information technologies

			(World Wide Web)
Venkatesh And Davis [184]	Technology Acceptance Model	Social Influence Processes (Subjective Norm, Voluntariness, And Image) And Cognitive Instrumental Processes (Job Relevance, Output Quality, Result Demonstrability)	User Adoption Behavior
Moon and Kim [191]	Technology Acceptance Model	Playfulness	World-Wide-Web
Pavlou [142]	Extended Technology Acceptance Model	Trust and Perceived Risk	Acceptance of E-Commerce
Gefen Et Al. [193]	Technology Acceptance Model	Trust	Online Commerce
Pikkarainen Et Al. [194]	Technology Acceptance Model	TAM in online environment	Acceptance Online Banking in Finland
Chiu Et Al. [195]	Technology Acceptance Model	Personal Innovativeness	
Wu And Chen [196]	Extension of Trust and TAM model with TPB	TAM and Trust, TPB	Online tax
Walczuch Et Al. [197]	Technology Acceptance Model and technology readiness index (TRI)	TAM and Technology	Understand relationship of

		Readiness traits	personality and technology acceptance
Lee [170]]	Technology Acceptance Model with Theory of Planned Behavior	Perceived Risk and Perceived Benefit	Adoption of Internet Banking.
Chen And Chen [198]	Extended Technology Acceptance Model		Automotive Telematics Users' Usage Intention
Stern Et Al. [199]	Extended Technology Acceptance Model		Consumers' Acceptance of Online Auctions
Serenko Et Al. [200]	Extended Technology Acceptance Model		User Acceptance of Interface Agents in Daily Work Applications
Chen Et Al. [201]	Technology Acceptance Model, Theory of Planned Behavior, And Technology Readiness		Adoption of Self-Service Technologies
Ervasti And Helaakoski [202]	Model Based on TAM And TPB		Mobile Service Adoption
Shafeek [203]	TAM		Acceptance Of e-Learning Systems By Teachers

Table 3.2: TAM Based Studies

Research	**Focus**	**Variables**
Ba and Pavlou [341]	Online auction (eBay)	Trust
Gefen [193]	Enterprise Resource	Trust

	Planning	
Pavlou [142]	E-commerce	Satisfaction with past transactions PU, PEOU Trust Intention to transact
Gefen [168]	Online shopping	Trust Inquire Purchase
Gefen et al. [213]	Online shopping	Trust PU, PEOU Purchase intentions
Gefen and Straub [233]	Online shopping	Trust Social presence PU, PEOU, Purchase intentions
Gefen et al. [212]	Online shopping	Trust PU, PEOU Intended use
Liu et al. [215]	Online shopping	Trust Intention
Koufaris and Hampton-Sosa [373]	Online company	PEOU, PU
Suh and Han [209]	Internet banking	Trust PU, PEOU Attitude Behavioral intention Actual usage
Kim and Prabhakar [464]	Internet banking	Trust in bank Initial trust Adoption
Wang and Benbasat [210]	Online recommendation	Trust in agent PU, PEOU Intention to adopt
Wu et. al [465]	e-commerce	Attitude, PEOU, PU, Trust, BI
Dahlberg [466]	Mobile Payment Solutions	disposition to trust and perceived trust. PEOU, PU, Attitude, Intention, Extrinsic Motivation, Actual system use
Beldad, Ardion D., and Sabrina M. Hegner [467]	Fitness App	PU, PEOU, Injunctive Social norm, Descriptive social norm, trust in fitness app developer, health valuation
Kesharwani, Ankit, and Shailendra Singh Bisht [468]	Internet banking adoption	PU, PEOU, Social Influences, perceived behavioral control, Web site design, Trust

Table 3.3: Trust in TAM Based Studies

3.4 Youth

Youth has been defined in varied ways worldwide. Kenya defines youth as an individual between the age bracket of 18 and 35 years [395]. Multiple UN bodies, instruments and regional establishments tend to have slight differences in their definitions of youth that are recognized by the United Nations secretariat.

Likewise, in academic literature, youth have been defined in varied ways. The following table 2.1 summarizes all these differences:

Youth Definition by Organizations		
Entity/Instrument/ Organization	**Age**	**Reference**
UN Secretariat/UNESCO	Youth 15-24	UN Instruments, Statistics
UN Habitat (Youth Fund)	Youth 15-32	Agenda 21
UNICEF/WHO/UNFPA	Adolescent: 10-19, Young People: 10-24, Youth: 15-24	UNFPA
UNICEF/The Convention on Rights of the Child	Child until 18	UNICEF
The African Youth Charter	Youth:15-35	African Union,2006
Youth Definition by Literature		
Author	**Age**	**Age Group**
Paul [58]	24 and 41 years	1977 and 1994
Markert [59]	13 and 32 years	1986 and 2005
Kumar, A., & Lim, H. [60]	24 and 38 years	1980 and 1994
Noble et al. [61]	14 and 31 years	1977 and 2000
Zhang, Carpenter, and Brosdahl [62]	23 and 37 years	1981 and 1995
Aksoy et al. [63]	23 and 37 years	1981 and 1995
Capgemini [64]	18 and 34 years	

Kim, D., and Jang, S. S. [65]	24 and 41 years	1977 and 1994
Yigit S and Aksay K [66]	18 and 37 years	1981 and 2000
Nekmahmud, M., Rahman, M. F., Huq, S. M., and Rahman, S. [67]	15 and 30 years	1980 and 2000

Table 3.4: Youth Definitions by Organizations and Literature

The present research defined youth as those individuals who were born between 1983 and 2000 and were aged between 18 and 35 years.

3.5 Research Framework

On basis of the literature of the technology adoption models, the research proposed the conceptual research model based on TAM and included key constructs which were perceived usefulness (PU), perceived ease of use (PEOU), attitude, trust and behavioral intention (BI).

3.5.1 Trust

Trust is defined as ‘‘an individual belief that others will behave based on an individual’s expectation” [203, 204]. It is propensity to have faith in positive qualities of others [205]. “It is referred to as the confidence that individual places on others that they will not behave opportunistically by captivating benefit of the situation” [206]. Consumers tend to be anxious with electronic providers while doing purchasing through internet [176]. The user holds doubts regarding the security of payment services, absence of proper security standards, absence of profit making business models and distrust regarding the compromise of their personal data [207]. Researchers have established that such susceptibility and insecurity can be eliminated by establishing trust in electronic commerce environment by minimizing risks, fraudulent activities and uncertainty [167,142, 206, 41, 208, 209, 209, 176].

Many researchers have examined the role and impact of trust as shown in table below:

Author, Study Domain	**Focus**	**Outcome**
Warkentin, Gefen, Pavlou, and Rose [469] (e-government information)	Trust and Risk	Conceptual review with proposition that relate trust and risk to intention

Fitzgerald and Kiel [470] (Online purchasing)	Risk	Risk was significant predictor of innovation (IDT) for both adopters and non-adopters
Thatcher and Perrewe [471]	Trait anxiety, computer anxiety, personal innovativeness, and CSE	PI was a significant predictor of anxiety, and all relationships were supported
Pavlou [472] (E commerce)	Trust and perceived risk (PR)	Trust was significant in predicting PU, PEOU, intention and PR. PR was significant in predicting intention to transact
Gefen, Karahanna, and Straub [193] (Online shopping)	Trust (decomposed)	Trust was significant in predicting PU and intended use.
Suh and Han [209] (E commerce)	Trust	Trust significantly predicted attitude and intention toward using e-commerce

Table 3.5: Trust based Studies

Grabner-Krauter and Faullant [211] advocated that trust was highly crucial and was present in situation of uncertainty and risk so individual in order to have trust must have something he may lose if trust was compromised [83]. Grabner-Krauter and Faullant [211] advised trust of customer was essential element in all b-to-c dealings and was a fundamental feature of e- commerce. Since transactions in electronic commerce were conducted in virtual mode and not face to face, trust was considered as highly critical and essential [206, 203, 204, 176]. Trust has huge impact on the intention to use a technology [211, 206, 212, 213, 214, 208, 209].

3.5.2 Perceived usefulness

Davis et al. [161] defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance". There was strong association of PU with efficiency. PU advised that usage of IS in job- environment would escalate individual's efficiency, enhance work related efficiency and effectiveness and was beneficial in work. Perceived usefulness was one of the fundamental constructs of TAM to explain user acceptance of technology. PU was one of the major determinants of adoption of a technology.

It influenced the formation of attitude towards adoption in individuals. PU was related closely with yield. The research work by Luarn and Lin [107] observed influence of perceived usefulness on formation of preliminary will for using mobile banking. Gu et al. [177] concluded the strong impact of perceived usefulness on behavioral intention in mobile banking in Korea. Hence there was strong probability that individuals preferred mobile banking because they consider it useful [91]. So, it was foreseeable that users choose mobile based services because they identify it as useful to them. Taleghani Et. Al. [216] research identified that perceived usefulness was the important determinant for adoption of mobile banking. Hence the individuals would adopt mobile banking if he believed it was useful and helpful to him.

3.5.3 Perceived ease of use

Davis [146] defined perceived ease of as "the degree to which a person believes that using a particular system would be free of effort". Considering the technical restrictions of mobile phones, perceived ease of use was essential determinant of adoption of mobile applications [183]. Past researches have supported the strong association between perceived ease of use and attitude towards intention to use [217, 107, 218, 219, 220]. Since perceived ease of use determined the individual's views on technology hence it determined its adoption [166, 146, 183, 222]. In TAM model perceived ease of use was an important determinant of adoption of a technology. Since perceived ease of use referred to level of easiness of using a system, so if the system was complex to use it would not be desired and used at an extensive level neither would it be used in general. Hence perceived ease of use played significant role in influencing the individual's attitude towards its acceptance. Venkatesh and Davis [184] identified that perceived ease of use had strong direct impact on the acceptance of the information system. The impact of perceived ease of use on intention was established in online banking in Malaysian context by Guriting and Ndubisi [217]. The impact of perceived ease of use was identified by Karahanna et al. [223] in adopting software in prospective users. Guriting and Ndubisi [217] advocated that the individual was expected to accept internet banking if he found it easy to be used. Lau (2002) identified strong impact of perceived ease of use on intention in online trading system. Significant impact of perceived ease of use on preliminary will formation for using online banking was established by Ramayah et al [220] which was also substantiated in studies by Wang et al [219], Adam et al [332], Davis et al [161] and Ramayah et al [224]. The strong impact of perceived ease of use in

use intention of internet-based store was concluded by Moon and Kim [225]. With respect to wireless finance in Netherlands, Kleijnen et al. [218] concluded strong impact of perceived ease of use on adoption and use. Gu et al. [177] found that perceived ease of use had high impact on behavioral intention to adopt mobile banking in Korea. Taleghani Et. Al. [216] research identified that perceived ease of use was the important determinant for adoption of mobile banking. This particularly holds good for mobile banking services where the providers are competing with set of offerings and must offer benefits in terms of ease of use such as easy to understand device symbols, device keys and simplified and small payment methods [171]. Amin [91] advocated that individuals would consider adopting mobile banking if they found it easy to use. Study on adoption intention of m-banking services by Cheah [226] concluded that perceived ease of use have significant impact on intention to adopt. Therefore, the user would adopt mobile banking if he found that it was easy to use and was free from effort and hence would develop a positive perception towards it.

3.5.4 Relationship of Trust, PU and PEOU

Pavlou [141] advocated through his research that trust influenced perceived usefulness and perceived ease-of-use in electronic commerce environment. Whereas Suh and Han [209] suggested perceived usefulness influenced trust in online banking. Most of the studies, however, had general belief that trust influenced perceived usefulness and perceived ease-of-use influenced trust [206, 209]. Chung and Kwon [239] research on examination of trust factor in mobile banking asserted that trust was vital factor in all monetary transactions in offline as well as online mode.

Balmaceda and Phillips-Wren [100] researched on the impact of trust factor on the success of IT reform in Chile. These researchers used TAM model that was extended to add trust as an external variable and examined impact on perceived usefulness and perceived ease of use. The present study includes trust also as the external variable and study its influence on perceived usefulness and perceived ease of use to study its impact on adoption of mobile banking.

3.5.5 Relationship of PU and PEOU

Perceived usefulness is predicted by perceived ease of use since, presuming rest of things as same, individuals perceived a technology more useful when it involved less amount of efforts. TAM proposed that ease of use was believed to have impact on the perceived usefulness of the given system. If the current technology was easy to use, higher would be the benefits anticipated from its use with reference to the increase in the performance This relationship has also been validated in online technology context. Plenty of studies in the past have investigated and supported this relationship in offline as well as online context [145, 160, 164, 183, 191, 140,229, 211, 192, 227, 228].

3.5.6 Attitude

Attitude is the positive or negative evaluation of certain behavior [154]. Attitude towards using a service is identified through the perceptions about the consequences of using it and positive evaluation of the consequences [45]. Men and women differ significantly in terms of attitude towards new technologies. As suggested by Venkatesh et al. [138], attitude towards using a technology in the place of work is predominantly influenced by perceived usefulness of this technology and usefulness has stronger influence on males than females. However, usefulness is just one determinant of attitudes and attitude is influenced by both usefulness, ease of use and also by trust and social influence in the present context of mobile banking services.

3.5.7 Relationship of Trust and Attitude

Gu et al. [177] found that trust plays very important role in forming behavioral intention towards adoption of mobile banking in Korea. Banks must provide mobile banking services that are trustworthy, precise and speedy [176]. Trust in mobile banking strongly necessitates the trust on the bank and/or the financial service providers, but the latter is relatively low [239]. In contrast with the physical transaction, banking through virtual medium lacks human interface [210] and is invisible as a result establishing trust becomes more challenging [239]. The extent of trust users holds on mobile banking varies with time [239], rather trust in primary stages is more vital to enable development of associations with the user [205]. In m-commerce context, Kim and Benbasat [241] suggested that the service provider's ability, integrity and dependability influences user's trust formation. Jarvenpaa et al. (2004) advocated that trust do not have direct influence on intention rather it acts as moderator and effects on individual's assessment of

information. Trust formation is a challenging task however once trusts is established it encourages the initial mobile banking users to motivate others as well to use it [239].

The user's satisfaction on mobile banking varies with their trust and can be heightened by incorporating demos and public relations initiatives to enhance individual's trust [215]. Agwu et. Al. [243] research work on Nigerian bank customers revealed that individuals intend to use mobile banking however the absence of trust deters the adoption. This trust is associated with delivery mediums and technology, the communication networks, the government's policies etc. They prefer traditional banking rather than electronic. Trust forms part of many important adoption models but been left out in TAM. In past researches Trust has been tested in different ways. For instance, Lin [119] incorporated in form of knowledge of trust through perceived integrity, benevolence and competence. Koenig-Lewis et al [95] and Zhao et al [244] have revealed the indirect impact of trust on m-banking adoption.

Trust is found to decrease perceived risk [245]. The presence of malwares such as virus etc. can come in mobile devices as well, hence such issues increase the individual's anxiety about integrity and security of transactions and minimize trust that may influence the intention to adopt mobile banking [251, 252] Individual's tendency to trust will be different from one another, some people are more trusting then others [253]. Likewise, the strategies that are required to target people with low trust would be different from those with higher trust [254]. People who are more trusting will develop trust on unknown vendor in virtual environment more quickly than others [255]. Whatever is the level of trust, to have a positive attitude towards use of mobile banking the individuals trust on it plays significant role.

3.5.8 Behavioral Intention

Behavioral intention is the intention to use a particular technology. The attitude and intention have significant positive relationship in terms of mobile banking services [256]. User's attitude predicts the intention to use mobile banking [256]. Attitude must form part of m-commerce studies [256]. Singh et al [108] in their research in villages in India identified absence of trust in the security of channel as major deterrent to adopt mobile banking. Trust acts as a facilitator for interchange of dealings between purchasers and vendors [141, 246]. Owing to high extent of uncertain environment and perceived risk in electronic commerce processes, trust turns out to be

an essential element to build customer assurance on the dealing person [247, 254, 249, 250, 141]). If the individual holds positive trust beliefs, that indicates his perception of safety and willingness of reliability on the provider [239]. Hence trust influences the intention to use the given service.

3.5.9 Relationship of PU and BI

Past researches have established significant association between PU and intention to system use [107, 230, 194, 219, 135, 231, 232, 223, 126]. In online environment the impact of PU on intention was found by several researchers [233, 234, 235]. PU as vital determinant of intention in using internet-based retailer and his website was suggested by Chen et al [236]. Likewise, study by Cheong and Park [230] identified strong association among perceived usefulness and online buying intentions. The significant impact of PU on intention in mobile commerce context was proven by Yang [237] . Nysveen et al [238] proved PU as essential determinant of use intention in context of WAP based mobile devices [222]. Study on adoption intention of m-banking services by Cheah [226] concluded that perceived usefulness have significant impact on intention to adopt.

3.6 Influence of Demographic factors on Mobile Banking Adoption

Researchers in the past have established the impact of demographics to analyze consumers' acceptance, adoption and usage of new technologies.

Amin et al [257] study on undergraduate university students in Malaysia indicated that, the university students tend to change the way they do banking in the future, more than 80 per cent of the respondents claimed to be willing to adopt mobile banking in the future and tend to be an active user for mobile banking in the future after been employed.

Study by Al-Ashban [258], found an existence of relationship between age of customer and technology adoption.

Karjaluoto et al [259], established that age was significant factor in mobile banking adoption. There have been extensively researches on the impact of demographics on adoption and usage of electronic services [260, 199, 259, 261, 262, 263, 264]. The studies on adoption and use of latest technologies demonstrated a prevalence of male, younger, highly educated and having a higher income, then those who do not adopt such technologies [265, 266, 267]. One of the most studied demographic characteristics regarding electronic services was gender. The perception of risk in female was found to be higher than males in online business activities [45, 136, 268].

Mobile banking adoption users were found to be usually married and male. Also, people with PG qualification preferred mobile banking. Males had more positive inclinations towards mobile commerce than women [269].

Literature on consumer behavior emphasized the differences in gender behavior by virtue of their information processing specifically in responses on product or service choices and their motivations [270, 271, 272, 194]. Women seek social orientation, general communications and have inclination towards cooperation. Men are competitive in their discussions with definitive communications having concealed purpose to build and maintain social status [273, 274, 233]. Men strive to safeguard their autonomous identity where women have tendency to seek and reaffirm closeness, affinity, support and harmony. Such disparity was also visible in interfaces meant for solving the problems where men had propensity to solve the problem and women laid focus on understanding, accord and compassion [275, 274, 233]. Women responses to nonverbal impetus seek associations, were fantasized and relatively more elaborative then men [275, 194]. These gender differences by consumer researchers in past years were believed to be more intricate and evolving from factors other than biological differences such as gender trait differences [276, 277, 278, 279]. Certain aspects of personality were related with masculinity and femininity. Masculinity implied being assertive, independent and rational and femininity is related with relational and interdependent features like being considerate, empathetic, sensitive, responsible and caring [280, 281, 279]. Therefore, the consumer behavior research inculcates the concepts of gender identity occasionally referred to as psychological sex and deemed to be phenomena having two dimensions masculine personality traits and feminine traits [281, 279]. Some researchers believed that irrespective of the biological sex an individual may associate himself with any of these dimensions [279]. Other researchers suggest that the gender roles are

the common cultural expectations laid on the individuals based on their socially defined gender [282, 283, 284, 1991, 285]. As proposed by Chodorow [286] based on Freud analysis of early childhood, the girls consider their mothers as role models and imitate them in social communications when encouraged to do so and turn out to be caring, compassionate and associative. On the contrary boys are distanced from their mothers that create a sense of isolation within them making them explore their own identities. In a way where girls are driven to be empathetic, social and caring boys on the other hand are motivated to have independence, boldness and sense of accomplishment. Hence these two roles form the cultural expectations that coerce the gender role processing for lifetime. The individuals abide by these cultural expectations and behave in consistence with the expectations concerning their gender in order to avoid the social pressures [287, 288, 285] These expectations drive individuals to form and get associated in groups that develop their self and overall social identity which lays significant influence on individual's way of living, career, relationship and expression of feelings [285]. In addition to these theories Jackson et al [289] proposed that the model of consumer socialization [290] and cohort theory [291] supports differences in attitudes, norms and behavior among social groups like gender groups. The consumer socialization pertains to influences from sources or ''socializing agents'' which carry forward the social norms, attitudes, drives and behavior to the novice individual or recipient of the influence [292, 293, 294]. As per the cohort theory, customers shared experiences with overall social, political and economic incidents occurring during the adolescent years [295, 296, 297] can be imbibed into distinct consumer groups as unique value set, beliefs, aspirations and behaviors. In an integrative manner these frameworks proposed logical reasoning to indicate differences in preferences among the different social groups [289].

Gender specific distinctions were supported in plenty of previous studies [298, 299]. Some previous researches also focused on gender differences in IT, but these differences did not pertain to IT diffusion in specific context [233]. Some of these studies suggested that men recognize more prospects in trying out different PC applications then women demonstrating higher positive attitude and keenness towards computer technology [300, 301]. Women possessed low self-confidence in their capability to use newer technologies and are more reactive to elaborative and comprehensive information to learn then men [302, 303, 304, 305]. As a result of

female tendency to sought information the impact of skillfulness and challenge on investigative behavior was greater [306]. Previous literature suggested the behavioral differences in individuals in the virtual context on basis of their gender. Gefen and Straub [233] confirmed the existence of dissimilarities in perceptions of male and female with respect to e-mail usage. Venkatesh and Morris [137] concluded presence of motive differences for usage of new software system in the office. Men were believed to possess higher propensity to engage in e commerce then women. Men were more likely to carry out planned purchasing whereas women tend to purchase other kinds of stuff and do less planned purchasing [300, 307]. Men have comparatively higher positive attitude towards online shopping than women [308, 309]. These gender differences may contribute to the moderating role for perceptions on attitudes and mobile banking intentions. It was implied that influences of usefulness and ease of use on attitude and mobile banking intentions may be moderated by gender.

Study by Amin et al [257] on undergraduate university students in Malaysia inferred that expectation of mobile banking amongst university students varied based on gender. For female's security was a concern whereas males give more attention to the effectiveness. Male users were more predominant users of mobile banking services [131, 264,119].

There is extensive work on the influence of demographic factors on the adoption of e-devices [312]. Study by Howcroft et al. [313] showed that young individuals gave lot of importance to the convenient and/or time efficiency offered by e-banking higher than elder individuals. Also, it was established that there is no impact of education level on the e-banking. Young technology savvy consumers were found to place higher prominence on mobile banking as compared to the elder consumers [314, 311]. Study by Karjaluoto et al. [259], determined that characteristic of e-banking users in Finland where they were highly educated, comparatively young and rich people having reasonable know how of computers particularly the internet. Laforet S, Xiaoyan Li, [131] established that the m-banking users in China were males, with age till 44 years and were falling in higher income segment. Also, there was no impact of education on m-banking.

Crabbe et. Al. [26] established that demographics were key influencers in adoption choices. It was observed that in Ghana demographic, social and cultural factors influenced the individual's adoption decisions substantially. Sulaiman A, Jaafar NI, Mohezar S. [315] research concluded

that demographic and psychographic factors influence acceptance of innovative technology such as m-banking in Malaysia especially age, gender, income (self) and education. Goswami and Raghavendran S [316] asserted that the mobile-savvy college students using mobile phones for multiple services other than voice services play vital role in driving adoption of innovations such a m-banking.

The Study by Foon, et al. [317] in Malaysia identified that age and education have strong impact on doing banking through mobile phone. Research by Dasgupta, et al. [318] in India concluded that gender and age were the major influencers. Hsiao and Chen [319] in their study in Taiwan examined smartphone demand by exploring the variances in three characteristics: mobile phone handset, Internet access and mobile services and their associations and measuring impact of demographics. The study established associations in three dimensions was not much, that user's demographics (gender, age, occupation and income) have strong impact on the choice of voice and 3G Internet, and the monthly 3G Internet fee [319]. The demographic variables often form part of technology adoption models [320, 118, 321, 35].

Gender- Tendency of males is usually more towards technology adoption then females. [36, 34]. Gender influenced behavior hugely [135]. Males are more inclined towards using technology [322] and possess a positive attitude for computers as compared to females [323]. Multiple researches have also employed gender as moderating variable while studying information technology adoption [324, 138]. The belief factors perceived usefulness and perceived ease of use of technology are related with gender [135]. Females are found to be more susceptible in using computers then males [325, 252]. In Brazil men possessed more trust towards mobile banking then women [252].

Age-Youth are more inclined towards using newer technologies as compared to old [36, 34]. The explanation for the inverse association between age and technology adoption is associated with physical features that change with time [326, 327]. "Older adults report more computer anxiety than young adults" Laguna and Babcock [328], p. 324. Individuals familiarized with computers in young years develop higher positive attitude [329]. It may be better strategy to introduce technology during early years to decrease their apprehensions at older age. Electronic banking was

more often adopted by individual who have high education levels and were young [36] and same hold good to mobile banking users.

Research by Cruz et al. [329] in Brazil concluded that youngsters perceived mobile banking as less difficult to use compared to old people. The impact of perceived security risk and perceived privacy risk on attitude towards mobile banking was insignificant amongst individuals in 18 to 25 years of age [94]. The younger individuals were less vulnerable to the effect of risk perceptions towards technology thus embrace high level of trust in mobile banking [94, 252]. In Brazil young people possessed more trust towards mobile banking then older ones [252]. Past studies have established that individuals with higher salaries, younger age group and higher social standing adopt new technologies [22]. Laukkanen and Pasanen [264] identified that the people in age group of 30-49 were unique mobile banking users. Puschel et al [330] determined that people in older ages found it more challenging to use mobile banking as compared to the youth segment. Au and Kauffman [114] deliberated that mobile payments would substitute cash and card to be universal payment channel and the youth segment will comprise of major m-payment adopters.

3.7 Conclusion

The key concept of adoption and the process of how adoption happens were discussed in chapter. The way adoption is understood in term of technology adoption was discussed. The findings pertaining to similar studies and the way they have impact to the adoption and use were discussed. The major theories that explain adoption of technology such as Theory of reasoned action, theory of planned behavior, decomposed theory of planned behavior, and technology acceptance model which form the base for the research model in this study have been described. The review of literature regarding adoption behavior, individual attitude and intention in technology use scenario has been looked into.

Chapter 4

Research Methodology

4.0 Chapter Introduction

This chapter outlines the research methodology adopted by the researcher. It describes the research philosophy and elucidates on the positivism and interpretivism philosophies in technology adoption research. The research approaches, deductive and inductive researches are discussed and compared, along with qualitative and quantitative research and time dimensions. Further the research methods used in this study are described. The research instrument used in the study is defined along with the sampling and ethical considerations. The timeline of data collection and data quality measures are discussed. Lastly the data collection plan is described followed by the chapter conclusion.

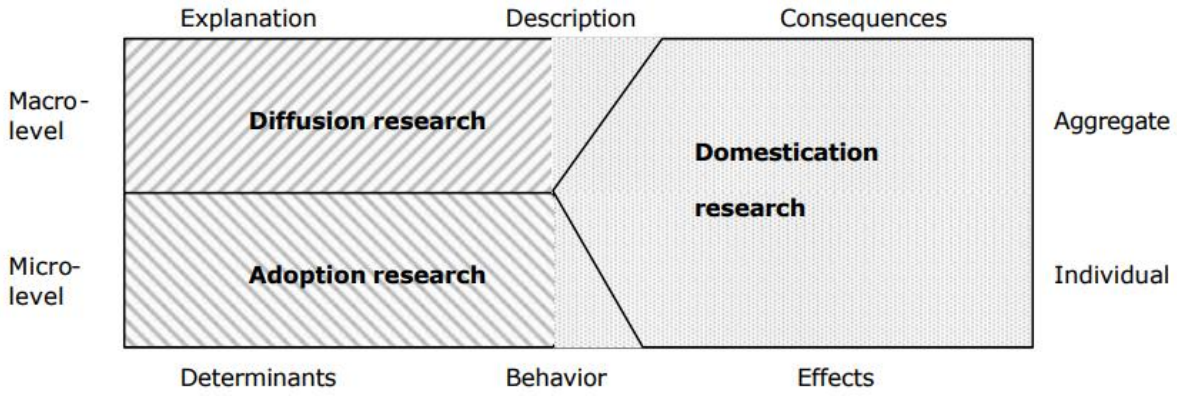
4.1 Background

Research Methodology is an approach of systematically solving a research problem. It is as an investigation about how inquiry of research problem is done logically. Methodology provides understanding of the different steps employed by the researcher in solving the problem along with the rationale behind using them. It is important for the researcher to know not just the research strategies/methods yet in addition the research methodology. It is expected researcher not just know how to apply specific research methods, however they likewise need to know which of these strategies or methods, are applicable and which are not, and what might they mean and show and why. Besides, researcher also need to comprehend the hypotheses following fundamental procedures and they have to know the criteria by which they can choose that specific strategies and techniques will be pertinent to specific issues furthermore, others won't. Primary purpose of research is to investigate the truth that is unseen and that has not yet been explored.

4.2 Research Methodology

Pedersen and Ling [396] discussed the research scopes on technology adoption which features the nuance and multifaceted perspectives of finalizing upon a specific methodology.

Figure 4.1: Research Perspectives in mobile technology adoption [396]



Pedersen and Ling [396] stated that there are three schools of thought that relate to the three conventional schools found in investigations of the adoption and use of technology: The diffusion, adoption and domestication schools of thought.

Diffusion researchers generally portray the entire adoption process posteriori as an S-molded function of time that might be utilized to classify adopters of various types. Rogers [22] tried to clarify the observed adoption behavior utilizing features of the technology being presented. He likewise depicted the diffusion process as comprising of four components; advancement or new innovation, a social framework, the communication channels of the social framework, and time. Of these components, Rogers [22] concentrated on the development, the social framework and the communication channels while describing the observed adoption behavior.

Adoption researchers normally illustrate and clarify the adoption choice of individual users using distinctive individual and social theories of decision making, however three models emerge as

the most commonly applied - the technology acceptance model (TAM) by Davis [146], the theory of reasoned action (TRA) by Fishbein and Ajzen [162], and the extension of TRA into a theory of planned behavior (TPB) proposed by Ajzen [154]. Numerous researches have applied one of these three theories to describe the user's adoption and use of various types of ICT-frameworks and applications.

"Domestication research has a long custom of reviewing the adoption and usage of technology in regular day to day manner such as the study of fixed telephony, study of television and study of personal computers. The sociology researchers dominate with their outlook in these types of researches and subsequently, descriptive investigations frequently portray the adoption and use of technologies by demographic factors, for example, age and gender. Although, the primary purpose of domestication research is to emphasize on the impact of domestication of technology on the society that illuminates the technique how the technology becomes incorporated in our day to day life" [396].

In addition, the research direction may be characterized into micro--level theories that focus on and investigate the individual's adoption and explicit innovative services/products and the macro-level theories that focus on and investigate on the organizational and systemic change in approaches.

The purpose of this research was to focus on the micro-level adoption and lay basis for further advance researches. It intended to understand the underlying criteria that individuals considered while adopting mobile banking. It's aim was to emphasize on the major predictors of the behavior towards adoption of mobile banking services. It followed descriptive research design approach to further analyze the existing variables and understand the dynamics of their inter-relationships.

4.3 Research philosophy

Research philosophy has been basically categorized into two major groups, ontology and epistemology [397]. Questions pertaining to the aspects of reality are congregated as ontological questions. Questions pertaining to kind of methodology incorporated in the study that signifies the manner the researcher tends to understand the information, its generation, in what way to draw value in it and its validity; are categorized as epistemological questions.

As stated by Saunders et al. [398], epistemology is concerned with that incorporates acceptable knowledge in the area of research. Two main viewpoints exist, positivism and interpretivism.

The philosophy of positivism is drawn from natural sciences. It is associated with observations and predictions, for instance cause and effect that may be used to generate laws such as generalizing the study results – the ways of the natural scientist [398]. Data collection based on the underlying theories is conducted, hypotheses statements are formulated and tested. The collection of data is in a systematic organized manner, is empirical, comprises of large samples of quantitative data that can be statistically tested. Such approaches are usually not prejudiced by the investigators values. Hence positivism is associated with quantitative data collection methods such as questionnaires, experiments etc. [398].

Interpretivism, on the contrary, follows a divergent method that believes that usage of natural science approaches cannot provide understanding of the world under study. Interpretivists critic positivism and claim that the statistical measures cannot represent the intricacies of the world and make simplistic set of generalizations from them. Interpretivism consists of qualitative data collection approaches that are not structured [398].

4.3.1 Deductive versus Inductive research approach

A deductive approach is created on pre-existing knowledge and theory in the given area of research. On basis of theory, the hypotheses are proposed, data is collected and analysis results in acceptance of rejection of the hypotheses proposed. Deductive analysis is analyzing the data to examine the existing theories and hypothesis formulated by the investigator [400].

Saunders et al. [398] recognized five phases in the deductive approach: framing the hypothesis, deduce propositions on basis of literature that can be tested, make comparisons of the hypotheses generated to existent literature, test the hypotheses and observe the results. If results show consistency with the theory then it is documented, otherwise then it is adjusted in view of the outcomes and retested.

Inductive research comprises of the building a theory based of observations drawn from the phenomena under study. It extends the study from specific to general. The observations are made and data is gathered to identify existing patterns that facilitate building of theoretical frameworks [398].

4.3.2 Research Strategies

Bryman and Bell [400] advises that quantitative research is a research strategy that lays emphasis on quantifying and analyzing the data, it follows a deductive approach among theory and the investigation putting prominence on testing the theory. It engages a natural science model and dwells in positivism approach, where analysis of empirical observations can be done through statistical methods.

Qualitative research, on the other hand, is a research strategy lays emphasis expressions and arguments over quantified collection and analysis of data. It follows an interpretive philosophy, that may incorporate both deductive and inductive approaches and do not favor a natural science model. Instead in this approach, preference is on data collection methods where the respondents express and infer their social world and assess their social realism as a dynamic phenomenon [400].

4.3.3 Time Dimension: Cross-sectional versus Longitudinal Studies

The classification of the research can be done on the basis time dimension into Cross-sectional and Longitudinal research [399].

In the cross-section study, the research is conducted during a given interval of time with constrained time and resources [398]. In longitudinal study, research is done over a long period of time and collection of data is done at multiple instances in time [398].

PARADIGM LEVEL	
Interpretivist	Positivist
No universal truth. Understand and interpret from researcher's own frame of reference. Uncommitted neutrality impossible. Realism of context important	Belief that world conforms to fixed laws of causation. Complexity can be tackled by reductionism. Emphasis on objectivity, measurement and repeatability
METHODOLOGICAL LEVEL	
Qualitative	Quantitative
Determining what things exist rather than how many there are. Thick description. Less structured and more responsive to needs and nature of research situation.	Use of mathematical and statistical techniques to identify facts and causal relationships. Samples can be larger and more representative. Results can be generalised to larger populations within known limits of error.
Induction	Deduction
Begins with specific instances which are used to arrive at overall generalizations which can be expected on the balance of probability. New evidence may cause conclusions to be revised. Criticized by many philosophers of science, but plays an important role in theory/ hypothesis conception.	Uses general results to ascribe properties to specific instances. An argument is valid if it is impossible for the conclusions to be false if the premises are true. Associated with theory verification/falsification and hypothesis testing.

Table 4.1: Summary of Research Dichotomies

(adapted from Fitzgerald, B. And Howcroft, D. [401, p. 160]

4.3.4 Research Philosophies Applied in Mobile Banking Adoption Studies

In mobile banking adoption studies, two philosophies are widely used, positivist and interpretive [321]. These researches have used different methods of data collection including surveys, interviews and triangulation. From the review of 55 studies conducted by Shaikh

And Karjaluoto[321], quantitative method approach was the major method employed in 82per cent of the researches while only 5 per cent (3 studies) deployed qualitative methods like interviews and 8 per cent (5 studies) made use of both methods. In the studies conducted on adoption of mobile banking and influence of trust in the technology adoption by Kazemi at al [403], Anus et al [405], Jaradat and Twaissi[404] and Maroofi et al [402], the influence of factors and presence or non-presence of relationship with trust and mobile banking adoption was examined by incorporating quantitative research methods.

4.3.5 Research Philosophies Applied in Present Research

The purpose of the present research was to understand technology adoption behavior and examine the influence of the belief constructs on intention of individuals to adopt the mobile banking services. Based on the review of previous research studies in similar domain, this research used positivistic deductive cross-sectional quantitative research philosophy. Few constraints in the research design hampered total generalization of the inferences of the research obtained. Alternatively, this research advances generalizations as potential seeds for further in-depth investigation. In that manner, the present research intends to simplify an intricate problem and identifies the most beneficial horizons for further research.

4.4 Research method

Pather and Remenyi[407] suggest that the quantitative researches, as per their definition, provide quantifiable outcomes. The research instrument usually used may be survey techniques using standardized questionnaire, experiments and empirical analysis [406]. The research method used in the present research is survey technique using a standardized questionnaire. Babbie [408] suggests that survey techniques offer empirical elucidations of the attitude and opinion of the population through the studying the sample. Babbie [408] argues that survey techniques facilitate the data collection in case of cross sectional studies and generalization of results drawn from sample to the population. In the present research, the data collection was conducted at one point in time; therefore, it was cross sectional research. The data was collected using administered questionnaire.

4.5 Research Instrument

The research instrument primarily used in this study was questionnaire. The questionnaire was constructed by conducting extensive literature review on studies on mobile banking and on basis of the objective of the research study. The scale items used in the questionnaire were adapted from previous studies and were contextualized for the present study. For investigating mobile technology adoption, TAM has previously been validated in a number of researches (Davis [146], Luarn and Lin [107]). All constructs used in the study were measured using multiple items on a seven-point Likert scale ranging from 1 (strongly disagree) to 7(strongly agree). PEOU and PU scale items were adapted from the original TAM presented by Davis [146]. Scale items for trust were taken from Liang et al [438]. Attitude and behavioral intention scale items were adapted from Taylor and Todd [128]. The research model consists of five constructs which were measured on multiple measurement items. The measurement items were sourced from past literature for preserving the content validity and adapted for current study [409].

The data was collected only by the users of mobile banking technology. To ascertain the collection of quality data by appropriate respondents, two qualifier statements were included in the questionnaire in the beginning which asked whether the respondent was aware of mobile banking and whether he has done banking using mobile phone.

In addition to the five constructs, data pertaining to mobile banking use was sought using five variables on respondent's preferred mode of transaction with bank for electronic banking, frequency and length of use and purpose of using mobile banking. Also, the information pertaining to the banks they prefer for conducting the transactions was sought.

Respondent's demographic data was sourced using seven statements to test the impact of demographics and training on mobile banking in India. The demographic variables included were gender, age, education, occupation, annual family income. Along the respondents were asked whether training/help was provided by banks on mobile banking use and the medium used by banks for providing this training.

The significance of adding and gauging impact of demographics can also be observed in study by Masrek et al [410] on impact of trust on mobile banking adoption and the limitation of the study of not including was found in the study by Jaradat and Twaissi [404].

Table 4.2 Questionnaire Scale Items and their References

Question Statements	References
It is easy to adopt mobile banking to accomplish my banking transactions.	Davis [146]
Mobile banking is very interactive	Davis [146]
Learning to use the mobile banking is difficult	Davis [146]
Purchasing/Transacting through mobile banking is easy	Davis [146]
Purchasing/Transacting through mobile banking is clear and understandable	Davis [146]
It is easy for me to perform the actions required to purchase/transact using mobile banking	Davis [146]
Overall, I believe that mobile banking is easy to use.	Davis [146]
Transacting using mobile banking is quicker	Davis [146]
It's more effective to make purchases/transactions through mobile banking	Davis [146]
It's useful and easy to purchase/transact through mobile banking	Davis [146]
Mobile banking increases my possibility to transact more	Davis [146]
It is easier to access my account information like balance amount, etc. through mobile banking	Davis [146]
The performances of mobile banking always meet my expectations	Liang et al [438]
My bank can be counted on (or trusted) for providing a secure mobile banking	Liang et al [438]
My bank provides a reliable mobile banking site	Liang et al [438]
Adopting mobile banking is an intelligent choice	Taylor and Todd [128]
Adopting mobile banking is a good decision	Taylor and Todd [128]

Adopting mobile banking is a positive idea	Taylor and Todd [128]
I am very likely to be dependent on mobile banking in future	Taylor and Todd [128]
I plan to increase my mobile banking usage in future	Taylor and Todd [128]
I believe my interest in mobile banking would increase in future	Taylor and Todd [128]

The questionnaire contained three sections. First section contained general questions pertaining to the respondent's use of mobile banking. Second section consisted of 21 scale items on a 7-point likert scale and the last section contained statements related to the respondent's demographic details. The questionnaire started with the introduction of the topic and summary of purpose which established the objective and importance of the research work and statement on confidentiality of data.

4.6Ethical Considerations

As suggested by Quinlan [397] "a researcher must reflect on their code of contact when engaging with participants, their methods of data collection and storage, how it is analyzed and how they write it up".

Ethics is integral component of every facet of the research process. It should diligently follow the two most significant principals of confidentiality and anonymity in the data collection. The code of ethics was sincerely followed in the research process. The research instrument made clear disclaimer on the clause of confidentiality of responses provided, its anonymity, the nature and objective of the research.

4.7 Population and Sampling

Population: "The most crucial phase in the research work is to define the target population" [411].

Sampling: "Sampling is the procedure that outlines the defining of the target population" [412, p.358].

Marshall [413] suggests "The objective of all quantitative sampling approaches is to draw a representative sample from the population, so that the results of studying the sample can then be generalized back to the population". The qualitative sampling on the other hand helps draw

insights and in-depth study on a small number of respondents and the results of the study cannot be generalized for the entire population.

Saunders et al. [398] identified two types of sampling techniques, probability and non-probability sampling and suggests that under time and cost constraints, non-probability sampling is most frequently used technique. Non-probability sampling (or non-random sampling) provides a range of alternative techniques to select samples based on your subjective judgement. [399].

The population defined for the present study included all the youth (aged between eighteen and thirty-five years) who have bank accounts and annual family income of rupees one lakh and above and used mobile banking for accessing their accounts or transacting on their account or both. Since it is hard to precisely quantify this target population, hence sampling was used for data collection. The banking customers from chosen geographical locations, who were satisfying the age and income criteria and used mobile banking services were employed for data collection.

4.8 Sample Size Considerations

As the sample size increases, the prospect of errors tends to reduce and after a point it starts nearing the population. So higher is the sample size, lesser would be the likelihood of errors. The appropriate sample size can be sought by using the statistics which specifies the confidence level and an appropriate margin of error for the research [398].

The Table 4.3 below shows the population size and the adequate sample that can be drawn from the specified margins of errors.

Table 4.3

	Margin of Error			
Population	**5%**	**3%**	**2%**	**1%**
50	44	48	49	50
100	79	91	96	99
150	108	132	141	148
200	132	168	185	196
250	151	203	226	244

300	168	234	267	291
400	196	291	343	384
500	217	340	414	475
750	254	440	571	696
1000	278	516	706	906
2000	322	696	1091	1655
5000	357	879	1622	3288
10000	370	964	1936	4899
100000	383	1056	2345	8762
1000000	384	1066	2395	9513
10000000	384	1067	2400	9595

Table 4.3 Population size and the sample size with respective margin of error

"For a population of one million to ten million, 384 samples can provide a 95 per cent confidence level with a 5% margin of error. For the same population, 1067 samples can provide a 95 per cent confidence level with a 3% margin of error" [398].

A sample of 1200 in the present research was used to represent the Indian population from which 793 were usable responses received. This sample size is apt according to the statistics provided by Saunders et al. [398]. Study was conducted in the Delhi (East, West, North, South) and NCR (Gurgaon, Noida, Faridabad, Ghaziabad) region and questionnaires were given to bank customers who were working professionals or students. The primary reason for selection of the selected regions in NCR was the voluminous presence of quality Universities, Institutes and Malls that inhabit the individuals from across the nation.

4.9 Sampling Techniques

This section discusses about the sampling technique used in identifying the appropriate respondents for the study to gather the data.

The study incorporated judgement sampling in its preliminary phase to make a judgement in identifying the universities, institutes and malls to find the suitable respondents for the study. Random sampling techniques were then followed to get responses from the given sample.

Judgement (Purposive) sampling technique: Saunders, et. Al [399] proposed that "Judgmental or Purposive sampling enables you to use your judgement to select cases that will best enable you to answer your research question(s) and to meet your objectives. This form of sample is often used when you wish to select cases that are particularly informative."

Simple Random Sampling Technique: Saunders, et Al [399] proposed that "simple random sampling is a technique which gives each unit of the population equal probability of being selected of the sample."

A judgment sample from educational institutions and malls were selected in Delhi and NCR region and data was collected. After that random sample of 600 students from postgraduate and undergraduate courses was drawn. This sample size was same as that of other similar researches such as Akturan and Tezcan [96] (having a sample of size of 435) and Hanafizadeh et al. [133] (having a sample size of 403). The respondents were selected on random basis in the campus premises and were requested to take part in the study. These educational places were chosen because they offered wide range of courses and were considered among the most preferred places for study.

Out of the data collected from the selected Malls for the study, random sample of 600 working professionals was drawn. These malls were chosen because they were most popular places for people to go for shopping or for leisure activities.

4.10 Data Quality

During the process of data gathering it was essential to ensure that data collected should be of good quality therefore, two quality standards were adhered to which were Validity and Reliability [399].

4.10.1 Validity

Saunders, Lewis and Thornhill [399] define validity as "the extent to which data collection method of choice returns what it is intended to measure, in other words validity ensures that findings are actually what they appear to be".

To ascertain the validity of data gathering process, these steps should be followed:

- The collection of data is through reliable and appropriate sources.
- The pre-testing and pilot testing of research instrument is done prior to distributing to the final respondent.
- The environmental influence is minimal during data collection such as the time of data collection is not influenced by any major event

A. Pre-testing:

To ascertain the design of research instrument for its format and contents, pre-testing should be done. It establishes the appropriate interpretation by the respondents and does confirm it captures the precise data it is intended to capture. To conduct pre-test, the instrument is generally provided to the experts in associated domain. The research instrument in the present research was pre-tested by the two experts in the e-banking domain who were academicians to validate the questionnaire design and contents for any errors. This exercise was useful in identifying few design gaps and suggestions related to measurement items were received and appropriate corrections were incorporated.

B. Pilot testing:

Further to the process of pre-testing, the questionnaire underwent required revisions and was provided to small subgroup of the target population. Pilot test was conducted on twenty-five respondents (10 working professionals and 15 students) to rectify errors, if any and to bring enhancement that is desired in the questionnaire design [414]. Pilot test was also done to ensure that the questionnaire was "comprehensible and to validate whether the survey instrument deployed was appropriate" [411]. The questionnaire showed few gaps like the question statement was ambiguous, the language of few items was not clearly interpreted by the respondents. Subsequently care was taken to reword the statement for more clarity and precision. For scale items, the respondents suggested that proper instructions to be written for the items on every page for clarity of responses which would eliminate the need to turn back the pages and also reduce the confusion leading to making incorrect choices in the box especially in the long columns. Corrections were incorporated in the questionnaire prior to its final distribution to the

target respondent. The final questionnaire was conducted by personally administering it. A copy of the questionnaire used or data collection is enclosed in Appendix III.

4.10.2 Reliability

Saunders, Lewis and Thornhill [399] define reliability as the "the extent to which data collection methods yields consistent results. Reliability ensures that similar observations would be made or similar conclusion would be driven by other researchers shall the research be performed by them. Reliability also ensures the transparency in the process of making sense out of collected raw data".

The design of instrument was a careful exercise to ensure consistency in interpretation of the statements in the instrument to establish reliability. Several measures were taken to ensure the reliability of data and guard from the threat of systematic errors or biasness, especially the observer, respondent (participant) and process biasness and errors [415, 416,417,418].

To address the observer biasness a well-structured instrument having close-ended statements was designed for data collection to minimize the danger of observer biasness by evading the subjectivity associated with the interpretation of open-ended questions.

For the respondent (participant) biasness, a major concern in such type of research studies is social desirability bias [419]. Social desirability bias is the tendency of the respondent to provide socially desirable responses even though they may not hold true for him but since they consider such responses to be correct and socially acceptable they tend to provide such responses. Therefore, to eliminate the responses to be socially acceptable, the disclaimer was made at the beginning of the questionnaire to guarantee the anonymity and confidentiality of the responses provided and instill the trust of not being judged upon by virtue of their responses.

Another possible concern for respondent biasness originates from the nature of the technology innovation. If the technology innovation is new that may result into that respondent is not well acquainted with the nuances of this technology and holds no clear judgement regarding it [420,421,422].

In such instances where the respondent has no clear judgement on the theme, he could find it difficult to comprehend or may not associate as relevant for him. This leads to the systematic errors (cf. MacKenzie and Podsakoff [417]). Therefore, an introduction note describing on the theme, its nature and importance was included in the research instrument to facilitate easy understanding and association of its relevance with respondent's personal lives.

In addition, probable cause for the participant error or process (method) biasness can emanate from the respondents' skill to understand the questions and infer, that can be caused by the presence of issues of intricate or abstract questions, ambiguous measurement item statements or doubled-barreled questions (cf. MacKenzie and Podsakoff [417]).

Such concerns were addressed by conducting extensive literature review and incorporating the pre-established and validated scale items successfully used in previous researches. This was done to ensure that the items are clear in their meaning and are unambiguous. Also, pilot testing process was conducted on small sample (twenty-five) from target population to review for any probable errors or gaps in understanding or associating with the research theme or the items.

This research used the Cronbach alpha to empirically test the reliability of the variables. As suggested by Field [423] and Tan and Teo [115] the value of Cronbach alpha of the items ranged from 0.60 to 0.925 hence it established adequate internal-consistency and reliability of items of the questionnaire. Hence it means that if the value is higher than minimum alpha of 0.60 the constructs were deemed reliable [424].

4.11 Data Collection

The research involved collection of two types of data. Qualitative data from the interview and focus group exercise. Quantitative data gathered through using the questionnaire. As suggested by Yin [425] "Interviews are guided two-way conversations‖ that allow the interviewer to ask respondent questions regarding the research area in a fluid rather than rigid way". While building the understanding of the problem and associated issues, qualitative data collection techniques including interviews and focus groups provide better insights and clarity. To gather data on a large scale and be able to generalize the study results a structured questionnaire technique is a good practice.

Data collection was done during the period of June 2015 to Feb 2016. It was done in three phases, Exploratory phase (Nov/2014 to Feb/2015)

- Preliminary Exploratory Phase- Study was exploratory in initial phase of problem identification and instrument development.
  - Focus Group- Students and Working Professionals
  - Interview- Students and Working Professionals
  - Interview- Bank managers

- Pilot phase (March/2015 to May/2015)
  - Questionnaire – Small sample of twenty-five respondents from the target population

- Final Questionnaire Phase (June/2015 to January/2016).
  - Questionnaire – Students and Working Professionals

Exploratory phase was initial phase of problem identification and instrument development that consisted of Interviews with the Bank managers and Focus group with Students and Working professionals. Pilot phase for review of the questionnaire for its design and contents to ensure validity and reliability in data collection process. Final questionnaire consisted of survey questions filled by Students and Working professionals. A total of 793 questionnaires received were considered acceptable that provided usable responses after discarding the invalid /incomplete data entries out of 1200, having a response rate of 66%.

4.12 Limitations of the research design

The survey conducted included close ended questions to allow collection of empirical data to understand the influence of factors on mobile banking adoption in India, the open-ended

questions were not included. Qualitative research method was not incorporated in final survey. If further research could be conducted using qualitative method open ended interview-based technique, it would provide deeper insights on the understanding of the factors.

The constraints of time and resource limited the quantitative research design approach for the study. Hence the further scope for the study could be to follow mixed method approach on this theme.

4.13 Conclusion

This chapter discussed the research methodology adopted by the researcher. It described the research philosophy, positivism and interpretivism philosophies in technology adoption research. By understanding the research approaches, deductive and inductive researches, qualitative and quantitative research and time dimensions, the researcher identified the suitable research philosophy, design and research instrument for the study. The appropriate sampling techniques and sample size were identified. The questionnaire design and data quality measures were discussed.

Chapter- 5

Analysis and Results

5.0 Introduction

In this chapter the results obtained from the research work are reported. The results are presented for the user group composed of students and working professionals. The descriptive analysis for the data obtained is conducted and reported followed by the analysis of the measurement and structural model.

5.1 Data Analysis and Results

The data analysis was conducted in multiple stages by using various statistical techniques. The first method was for extraction and grouping of factors based on respondent's perceptions considered vital in adopting mobile banking.

i. **Factor Analysis:** Factor Analysis using SPSS 19.0 was performed on the data collected by the respondents to conduct extraction of factors that the respondent's perceived as having significant influence on adoption of mobile banking. Especially exploratory factor analysis (EFA) was conducted as the investigator was uncertain as to how many factors existed amongst the number of variables included.

ii. **T- test and ANOVA test:** The next method tested whether there are differences in the user's perceptions on the factors extracted by EFA based on their demographic profile. In previous studies, gender [37, 437], age [257] it has been identified that demographics have strong influence on factors influencing adoption of mobile banking. The statistical methods use were t-test and ANOVA test

iii. **Missing data analysis:** Field [423] stated that the missing values can be present in the data owing to various factors such as in instances where the survey instrument is lengthy, the respondents may skip certain questions deliberately due to disinterest or mental fatigue. Another reason may be that the respondents do not want to respond on sensitive or personal questions. So, in order to deal with this issue, Field [423] proposed three methods:

a. Listwise deletion: Each record with missing data was deleted from the research analysis
b. Pairwise deletion: In this method, the record with missing data is not deleted rather it is not included in the analysis of the missing values of the research analysis
c. Replacing a missing score with the mean/median score: In this method every missing value is substituted by the mean/median value of the items in the construct.

In this research the listwise deletion method was used to handle the missing values. The sample for data collection was 1200 primarily. It was reduced to 841 after eliminating the missing values. A sample of 841 was a good sample size suitable for the SEM analysis.

iv. **Outliers:** Outliers are referred to as cases that have values which are peculiarly different from the other values in the entire dataset [426,427]. The identification of outliers in dataset is important as they may result in occurrence of errors while assessing the model fit, assessing the value of the variables and the standard error [428]. Tabachnick and Fidell, [429] and Kline [426] stated that "A univariate outlier is the case that has an extreme value on one variable whereas a multivariate outlier is a case with an unusual combination of values on two or more variables".

The present research examined presence of univariate outliers by studying the frequency distribution of Z-scores of the dataset, as recommended by Kline [426]. But there were no univariate outliers found since the study incorporated 7-point likert scale where 1- stood for strongly disagree and 7- for strongly agree. When the respondents are answering only on strongly disagree or strongly agree, then such responses may develop outliers since that only contains the extreme points in scale.

The multivariate outliers were examined by assessment of the Mahalanobis distance (D2). Mahalanobis distance provides the value of standard deviation of every data case with regards to the mean value of all the cases in the dataset [430, 426, 427]. Presence of high value of D2 indicates the case(s) as the extreme ones. Hence it is suggested to consider significance test like $p < 0.001$ for the D2 values [426, 427]

In the present research, 48 responses were eliminated from the dataset owing to occurrence of outliers, hence it resulted in 793 responses to be considered for the

analysis. D2 was again applied on the rest of the 793 datasets that established non-existence of any more outliers. Major presence of outliers was identified in some of PEOU items.

v. **Normality:** Hair et al. [427] advises that normality in the data can be observed on basis of skewness and kurtosis values. The values for asymmetry(skewness) between -2 and +2 are considered acceptable in order to prove normal univariate distribution [434]. Byrne [431] suggest kurtosis value of 3 for a normal, while values exceeding 5 indicates data are nonnormally distributed [433]. Thee normality of data was assessed by finding out the values of skewness and kurtosis. The values of skewness and kurtosis were observed to be less than ±2 hence confirming that data was normally distributed.

vi. **Multicollinearity:** To examine multicollinearity, the correlation matrix was generated for every item in the questionnaire. There was no presence of high strong correlation value (r >0.85) observed in the items. The findings revealed that data was free from multicollinearity.

5.2 Demographic Summary of Mobile Banking Users

Descriptive statistics helps the investigator in organizing the results [436]. The main form of descriptive analysis used in the study are frequency, mean and standard deviation. Frequency denotes the percentages of observations derived from the given statement. The frequency distribution helps the investigator to visualize the scores of the entire data set [435, 436].

Of the total of 1200 questionnaires from the youth segment comprising both of the students and the working professionals, 841 received were usable and 793 after data quality assessment. The study was focused on the users of mobile banking to identify the factors influencing the adoption of their mobile banking. The composition of the respondents' demographic characteristics is showed in table 5.1. The demographic characteristics of the respondents were observed using frequencies and percentage

As depicted in the table 5.1, 56 per cent of the individuals were students and 44 percent as working professionals. So, the composition was represented nearly equally by both the groups.

Category	Frequency	Percentage
Student	448	56%
Working	345	44%
Total	793	100%

Table 5.1: Respondent's Category

The sample was drawn from individuals who were using mobile banking, that provided a fair idea as well on the demographic characteristics of users of mobile banking in the Delhi ncr region. From 793 respondents, 69 per cent of the respondent were males whereas 31 per cent were females. This is consistent with the past researches that concluded males have higher likelihood towards adoption of technology innovation as compared to females [439].

Nearly 52 per cent of the respondents were in the age-group of 22-25 years and 18 per cent in 26-30 age category. Hence the majority segment is represented by the youth in age category of 22 and 25 years.

About 35 per cent were having annual household income between 3 lakhs and 5 lakhs. Also, major chunk of respondents was from student category (56 pe cent) followed by people working in private professions (36 per cent) as shown in table 5.2

Gender	1	Male	550	69%
	2	Female	243	31%
			793	**100%**
Age	1	18-21	148	19%
	2	22-25	412	52%
	3	26-30	141	18%
	4	31-35	92	12%
			793	**100%**

Profession	1	Student	448	56%
	2	Working Professional	345	44%
			793	**100%**
Monthly Family Income	1	Below 1 lakh	215	16%
	2	1 lakh up to 3 lakhs	221	19%
	3	3 lakhs up to 5 lakhs	184	35%
	4	5 lakhs up to 10 lakhs	115	20%
	5	Above 10 lakhs	58	10%
			793	**100%**

Table 5.2: Respondent's Demographic Summary

5.2.1 Students Category Demographics Summary

The category wise demographic characteristics of students showed that number of males (67 per cent) was higher than females (33 per cent). The largest number of the age group, about 70 per cent of the respondents belonged to the of 22-25 years of age-group as shown in table 53. 60 per cent were from non-technical stream and 40 per cent from technical stream in education.

Gender	1	Male	300	67%
	2	Female	148	33%
			448	**100%**
Age	1	18-21	96	21%
	2	22-25	314	70%
	3	26-30	36	8%
	4	31-35	2	0%
			448	**100%**
Educational Stream	1	Non-Technical	267	60%
	2	Technical	181	40%
			448	**100%**
Student Educational Stream Summary				
Technical Stream	1	BSc	37	20%
	2	MSc	25	14%

	3	BCA	46	25%
	4	MCA	12	7%
	5	BTech	60	33%
	6	MTech	1	1%
			181	**100%**
Non-Technical Stream	1	BBA	69	26%
	2	MBA	83	31%
	3	BA	34	13%
	4	MA	29	11%
	5	B.Com.	41	15%
	6	M.Com.	11	4%
			267	**100%**

Table 5.3: Respondent's Demographics Summary -Students

5.2.2 Working Professionals Category Demographics Summary

The demographic characteristics of working professionals showed that showed nearly 67 per cent of the respondents were males whereas females were 33 per cent. About 54 per cent of the respondents were in the age-group of 31-35 years followed by 23 per cent in 26- 30 age group. A major chunk of respondents were people working in private professions (83 per cent) and about 33 per cent were having annual household income from 3 lakhs up to 5 lakhs followed by 29 per cent earning from 5 lakhs up to 10 lakhs as shown in table 5.4.

Gender	1	Male	230	67%
	2	Female	115	33%
			345	**100%**
Age	1	18-21	13	4%
	2	22-25	66	19%
	3	26-30	80	23%
	4	31-35	186	54%

			345	**100%**
Profession	1	Private Professional	118	34%
	2	Self-employed/ Business	135	39%
	3	Government Service	92	27%
			345	**100%**
Monthly Family Income	1	Below 1 lakh	30	9%
	2	1 lakh up to 3 lakhs	77	22%
	3	3 lakhs up to 5 lakhs	115	33%
	4	5 lakhs up to 10 lakhs	99	29%
	5	Above 10 lakhs	24	7%
			345	**100%**

Table 5.4: Respondent's Demographics Summary - Working Professionals

5.3 Banking Use Summary of Respondents

The present research incorporates the responses from the respondents who are users of mobile banking and conduct banking with the leading public and private sector Indian banks.

The majority of respondents that had account with public sector banks were customers of State Bank of India HDFC (25.09 per cent) topping the list followed by Punjab National Bank (10.59 per cent), while HDFC (18.54 per cent) and ICICI (12.23 per cent) banks were the top most private sector banks respectively of the respondents of the study.

S. No.	Bank Name	Frequency	Percentage
1	State Bank of India	199	25.09%
2	HDFC Bank	147	18.54%
3	ICICI Bank	97	12.23%
4	Punjab National Bank	84	10.59%
5	Axis Bank	50	6.31%
6	Oriental Bank of Commerce	24	3.03%
7	Bank of India	18	2.27%

8	Corporation Bank	17	2.14%
9	Indian Bank	15	1.89%
10	Canara Bank	14	1.77%
11	Citibank	14	1.77%
12	Syndicate Bank	13	1.64%
13	Bank of Baroda	12	1.51%
14	Kotak Mahindra Bank	11	1.39%
15	Union Bank	9	1.13%
16	IDBI Bank	9	1.13%
17	Indian Overseas Bank	7	0.88%
18	Standard Charted Bank	7	0.88%
19	Central Bank of India	5	0.63%
20	Yes Bank	5	0.63%
21	UCO Bank	4	0.50%
22	Allahabad Bank	4	0.50%
23	Andhra Bank	3	0.38%
24	IndusInd Bank	3	0.38%
25	Bank of Maharashtra	3	0.38%
26	Dena Bank	3	0.38%
27	Jammu and Kashmir Bank	2	0.25%
28	State bank of Travancore	2	0.25%
29	HSBC Bank	2	0.25%
30	State Bank of Hyderabad	2	0.25%
31	State Bank of Patiala	2	0.25%
32	Karur Vysya Bank	1	0.13%
33	Karnataka Bank	1	0.13%
34	Ing Vyasya	1	0.13%
35	Maharashtra Bank	1	0.13%
36	Vijaya bank	1	0.13%
37	State Bank of Bikaner and Jaipur	1	0.13%

	Total	**793**	**100.00%**

Table 5.5: Respondent's Banking Details

The respondents identified using banks in two broad categories, public banks and private banks on basis of most frequently used bank for banking purposes. The summary of respondents belonging in each category is given in the table 5.6.

Summary of Banks Most frequently used by Respondents

S. No.	**Public**	**Private**
1	State Bank of India	HDFC Bank
2	Punjab National Bank	Axis Bank
3	Corporation Bank	ICICI Bank
4	Bank of Baroda	Kotak Mahindra Bank
5	Oriental Bank of Commerce	Karur Vysya Bank
6	Canara Bank	Yes Bank
7	Union Bank	IndusInd Bank
8	Central Bank of India	Citibank
9	Andhra Bank	Standard Charted
10	Syndicate Bank	Ing Vyasya
11	Karnataka Bank	HSBC Bank
12	UCO Bank	
13	Indian Overseas Bank	
14	Bank of India	
15	IDBI Bank	
16	Allahabad Bank	
17	Bank of Maharashtra	
18	Dena Bank	
19	Jammu and Kashmir Bank	
20	Maharashtra Bank	
21	Indian Bank	
22	State bank of Travancore	
23	Vijaya bank	
24	State Bank of Hyderabad	
25	State Bank of Patiala	
26	State Bank of Bikaner and Jaipur	

Table 5.6: List of banks respondents frequently bank

5.4 Mobile Banking Frequency and Usage Patterns

The table 5.7 depicts the use frequency of mobile banking by the respondents. Majority of respondents conduct banking activities on monthly basis (36.32 per cent) followed by individuals who rarely (30.01 per cent) transact using mobile banking.

S. No.	Frequency of Mobile Banking Use	Frequency	Percentage
1	Daily	40	5.04%
2	Weekly	181	22.82%
3	Monthly	288	36.32%
4	Quarterly	46	5.80%
5	Rarely	238	30.01%
	Total	**793**	**100.00%**

Table 5.7: Frequency of Mobile Banking Use

Mobile Banking Usage Patterns of the Respondents:

S. No.	Length of Mobile Banking Use	Frequency	Percentage
1	Less than 1 month	71	8.95%
2	1 to 3 months	182	22.95%
3	3 to 6 months	120	15.13%
4	Less than 1 year	244	30.77%
5	1 – 3 years	144	18.16%
6	More than 3 years	32	4.04%
	Total	**793**	**100.00%**

Table 5.8: Mobile Banking Usage Patterns of the Respondents

Source: Primary data collected through questionnaire

The table 5.8 depicts the usage patterns of mobile banking by the respondents. Majority of respondents (30.77 per cent) have been sing mobile banking for less than a year followed by individuals who have been using mobile banking for 1-3 months (22.95 per cent). As it is a new technology and India being a developing country, individuals have yet to infuse their trust and inclination towards its use. It is yet establishing its presence and use. The usage patterns indicate that respondents have begun adopting this service and are in the early stages of its use. Banking using mobile phones is yet to garner much success and appeal hence only minimal number of respondents (5.04 per cent) conduct transaction very frequently on weekly basis using mobile banking.

5.5 Qualitative Analysis

5.5.1 Focus Group Study:

Focus group technique is used during preliminary phase of the study to understand the phenomena and get better insights into the behavior of individuals regarding mobile banking adoption in Indian context. As suggested by Babbie [408],"the focus group method is most appropriate techniques for exploratory studies."

Focus group method in the present research was used to explore the adoption of mobile banking because focus group method technique allows to get deeper insights into the user beliefs, perceptions and their experiences of using this technology with far greater clarity and provides scope for unravelling issues that through other data collection techniques remain hidden or lesser known. This provides substantial direction towards refinement and designing of further quantitative study. "Focus group technique is a type of qualitative technique in which the though the analysis of data is complex and intricate but it provides great level of validity for the study outcomes." Dahlberg [466].

As focus group techniques need lot of time, the participants were remunerated with free lunch for being the study participant. The focus group method was conducted by the moderator who initiated the discussion on specific pointers and let the participants drive it further with their experiences and opinions and an assistant was used to prepare notes and transcribes. The study conducted focus group involving 6 individuals in one focus group. A total of 2 focus groups were conducted during this phase. The participants were the students from postgraduate and

undergraduate program respectively. Out of these 12, 6 were from Delhi and 6 from NCR region (Noida, Ghaziabad and Gurgaon).

Focus group discussion items

i. What is your level of awareness regarding the mobile banking service provided by Indian providers, what is your opinion about these services?
ii. Are you currently using a similar electronic banking, what is your opinion about it in comparison with mobile banking and which one is your preferred service out of them?
iii. As compared with the mode of banking you presently use, what according to you are the potential advantages or limitations of mobile banking?
iv. Why popularity of mobile banking is so low? What would you suggest and/or recommend for its improvement?

A. Focus group with Students

The analysis of focus group discussion with students revealed that the primary reason for use of banking through mobile phones by them was because it was convenient, time saving, easy and to get Interest/ benefits offered and as secure to use. For the non-users of mobile banking, most of them highlighted reasons such as lack of trust, security concerns, lack of information on its use and cited as complicated and technical to use as the technology was new for people to use.

The major facts that emerged from the focus groups were as discussed below:

i. What is your level of awareness regarding the mobile banking service provided by Indian providers, what is your opinion about these services?

The information regarding the mobile banking services is very limited among the students. Mobile banking is mostly identified by basic features such as checking the account balance or view the statement by the students. “I am aware how to check my balance by using my mobile phone, beyond that I have no knowledge” “I came to know about the mobile banking service while doing banking online, I am in no need to use mobile banking service right now, I prefer using my ATM card to making payments.”

” I use the airtel money to make mobile recharge and sometimes buy movie tickets and get

different types of offers on it" "I use internet banking on my smartphone and find it useful but little time consuming and complex to use as it takes lot of time and screen view is small"

ii. *Are you currently using a similar electronic banking, what is your opinion about it in comparison with mobile banking and which one is your preferred service out of them?*

The participants were aware of and have used mobile banking. They expressed their satisfaction with their current banking.

They opine that they are satisfied with their existing banking services. The reasons cited were ease of doing. Some participants using mobile banking expressed security as one of the reasons to use.

"I find online banking convenient to use and if mobile banking has more uses then it would have been preferred by many. But presently I find internet banking catering to all my banking needs satisfactorily"

"I usually do mobile banking; I have seen that mobile banking is highly secure. It asks for OTPs and passwords only known to me and I get information regarding every transaction done on my account through my mobile phone. My major use is to do balance check and paying for my mobile prepaid card, I do not transfer any money".

"I do not use mobile banking, I generally prefer ATM machines for most of my withdrawals and visit the bank if need to do banking. I don't check my account balances; just wait for the paper copy of bank statements to ensure the check on transactions done in the month and how much is the remaining amount in my account. I am satisfied with my banking. I don't want to use mobile banking as it is not safe. The hacking of the passwords can be done easily."

"I have used mobile banking for transferring money from one account to another. I received a code (OTP) from bank, and by giving this code I can complete the transaction, just as in online banking"

"I think people are happy with mobile banking."

iii. *As compared with the mode of banking you presently use, what according to you are the potential advantages or limitations of mobile banking?*

In comparison to the present bank services they use, most of the participants agree that mobile banking offers value that includes convenience, cost effectiveness and accessibility from anywhere. But few of them felt that it may be less secure and may involve more cost; some were having apprehensions related with the given small sizes of the device (mobile phone) to conduct mobile banking.

"If we hail from a rural region with no availability of bank branch, ATM or transport services, then mobile banking could be utilized for banking operations"

"I feel mobile banking services are good option for elderly or disabled individuals, Since they have problems in physical movements and hassles in driving for long distances to search for ATMs or bank branches"

"In my opinion mobile banking can be done at any place and at any time using the mobile phone, but we require some workstation to carry out banking in online banking mode"

"Mobile banking is especially suited for young people as they possess a high speed in using mobile features including new services apps, facebook even without looking at the keypad very often."

"I believe mobile banking is more useful for who do not have internet and a PC and have issues in travelling all the way to visit bank branches"

"In my point of view mobile banking is not very safe to have passwords"

"The usefulness of mobile banking is less in comparison with online banking (using PC), as the mobile phone screen and keypad is much small as compared to the PC and therefore is difficult to read."

"I do not trust doing banking using phone as I may lose all my money as the bank account is accessed using mobile phone, so information related to my account may also be lost"

"Traditional banking is safer as no one can access my bank related details"

"I feel mobile banking is very simple and easy to use, it offers convenience and speedy method for checking account balances etc. It can be further simplified for everyone to understand and use it."

i. Why popularity of mobile banking is so low? What would you suggest and/or recommend for its improvement?

Mobile banking is believed to be associated with security issues and difficult to use and considered complicated therefore it is not preferred by people. The participants suggested plenty of ways that may lead to making mobile banking services more useful. The first issue was how to address the security concerns:

"I feel out of fear of using technology for transactions, people are more skeptical and feel unsafe. So, if trust can be thrusted upon them by the means of issuing guarantees, giving detailed information about the mechanisms banks employ to ensure secure transactions, may develop a sense of trust and security among people."

"The passwords must be bundled up with more security measures."

"The services offered by mobile banking must include more features of banking to enable users to conduct more banking functions."

"I think more promotions need to be done by providers to educate people about the benefits and services offered by mobile banking. Also need to educate people how to conduct these transactions in simple manner. I have not seen many banks giving information on their mobile banking services and features."

"I feel that few bank employees also lack information on mobile banking use and services, so proper training to these may also result in promoting mobile banking to the people visiting bank branches and otherwise too."

The major ideas emerged from the focus group discussion are summarized below:

a) Mobile banking offers more convenience, easy and fast performance as compared to other banking services.

b) The younger Indians would find using mobile banking easier to use as they are naturally good at using mobile, at typing messages, using and working on different apps with comfort and ease.
c) Irrespective of whether individuals have information regarding mobile banking or not, they rarely use it. Those who do not have information don't use it due to their security apprehensions. Those who are aware about various security measures; expect rather more stringent security mechanisms.
d) The probability of use of mobile banking is high due to far and wide acceptance and use of mobile devices.
e) There should be more promotion of mobile banking features and services so as to inform and educate individuals of its functions and usability.

B. Focus Group with Working Professionals

Focus group discussion items

i. *What is your level of awareness regarding the mobile banking service provided by Indian providers, what is your opinion about these services?*
ii. *Are you currently using a similar electronic banking, what is your opinion about it in comparison with mobile banking and which one is your preferred service out of them?*
iii. *As compared with the mode of banking you presently use, what according to you are the potential advantages or limitations of mobile banking?*
iv. *Why popularity of mobile banking is so low? What would you suggest and/or recommend for its improvement?*

The study conducted focus group involving 6 individuals in one focus group. A total of 2 focus groups were conducted during this phase. The participants were the working professionals from Delhi, Noida, Gurgaon, Faridabad and Ghaziabad regions.

The primary reason for use of banking through mobile phones was because it was considered useful, very convenient, secure and easy to use.

i. *What is your level of awareness regarding the mobile banking service provided by Indian providers, what is your opinion about these services?*

The working professionals are fairly informative about mobile banking. Mobile banking, for them, is primarily identified as a useful and convenient service. The primary reason for using mobile banking was that it has provided a very useful way to conduct transactions. Though it is yet difficult to use because at some places the providers are limited.

"I am not sure about my data and money security".

"It is more secure as in electronic form as compared to physical money. Data security is ensured. Just be cautious by refraining from sharing details. It keeps track of my family expenses".

"I can track my expenses. The record of transaction is maintained so it is easy to keep track of transactions made and money spent".

"It helps me in making my transactions in and out. It has provided a very useful way to conduct transactions".

ii. *Are you currently using a similar electronic banking, what is your opinion about it in comparison with mobile banking and which one is your preferred service out of them?*

The participants shared they are using mixed modes of conducting transaction, visiting bank branch as well mobile banking. They express preference towards mobile banking owing to its convenience and any time use. However, they also expressed preference to traditional banking in special cases such as large money value transactions.

iii. *As compared with the mode of banking you presently use, what according to you are the potential advantages or limitations of mobile banking?*

In comparison to the present bank services they use, most of the participants agree that mobile banking offers value that includes convenience, cost effectiveness and accessibility from anywhere.

"It is very easy to use".

Mobile banking appeared to have influenced people's lifestyle to a great extent and lead to a positive experience.

"Using mobile banking provides me benefit of range of discounts while travelling provided by travel partners of the banks, cash back offers etc".

"My kids are living in Chennai and Hyderabad. They are able to use money from my account using mobile banking, it's about convenience. Geographical location makes a great difference such as Chennai, Hyderabad".

"I used e- wallet and enjoyed benefits offered while ordering coffee at barista.

"I experimented initially, found it convenient and easy to use. I use it more often now. Do not mind giving KYC on special customer. KYC can be updated.

At times I found it is easy to be the traditional Indian consumer as the transaction failed so many times but after some time (15-20 minutes) I got positive feedback communication. So, I was happy".

"I was doubtful initially but find it easy to use now".

"It led to change in my lifestyle. It provided me convenience that led to increase in expenses. As there are minimal restrictions of travelling and moving around hence has caused increase in the normal spending".

"It has led to more transparency in the dealings and people behave more honestly because of availability of all records and contact details".

"It was easy to use and simple. Initially took time but later was done easily".

iv. Why popularity of mobile banking is so low? What would you suggest and/or recommend for its improvement?

The group discussions revolved around the limitations of mobile banking providing responses as mentioned below:

“They should send less messages (push notifications)”.

“Data safety is major concern”.

“Network issues”

“Prone to unauthorized access 24/7”.

“There should be some guarantee by government body. Some regulations must be laid regarding money transfers”.

Though it was unanimously agreed that it has far wider reach, acceptance and availability. Few participants commented on the nuisance caused by the marketing campaigners by sending bulk messages and notifications. The concerns were also regarding the security of customer data. The network availability to enable conduct of mobile banking was also raised as one of the concerns during the discussion. In addition, the potential risk of unauthorized access was highlighted as a concern. The participants expected guarantees and regulations at place to ensure the security concerns are suitably addressed.

v. *The participants suggested plenty of ways that may lead to making mobile banking services more useful*

The participants suggested that the KYC concerns inhibit use of mobile banking with various service providers. So, make it more accepted and usable, the KYC requirement must be only with the bank and nowhere else in the entire eco system of mobile payments such as to various service providers, apps etc.

The major ideas emerged from the focus group discussion are summarized below:

a. Mobile banking offers more convenience, easy and fast performance as compared to other banking services.
b. It offers lot of value and services to users such as making money transfers online, to avail offers given by e-wallets, make payments for hotel bookings online; mobile postpaid

payments using mobile banking, electricity bill; train tickets payments and avail offers from e- wallets

c. Useful for making payments regarding children fees online, utility bill payments.
d. Mobile banking is believed to be associated with security issues and is difficult to use and considered complicated therefore it is not preferred by people.
e. The major limitations that hamper its adoption included customer data concerns, security of transactions, KYC concerns and excessive marketing through push notifications.

5.5.2 Interview Analysis

Major discussion Points

1. *What do you feel with the mention of mobile banking?*
2. *What was your experience on using mobile banking technology?*
3. *For what purposes you use mobile banking the most?*
4. *What is one thing you would like to change in mobile banking technology?*

A. Students Interviews

1. *What do you feel with the mention of mobile banking?*

The respondents shared their primary beliefs about mobile banking as a technology that provides convenience, planned expense, 24X7 availability, secured, transparency. They expressed that they can exchange money in digital form. Since the net banking service is used by small vendors as well to support net banking services hence enables wider use. They said mobile banking is a platform to make transactions online. However, it is not that everywhere they can use digital payment methods like small stalls and local shops do not support it. Also, most people don't have access to mobile banking hence cannot be participating partners in conduct of the transactions. Some said m-banking enabled them to keep track of their transactions. The respondents said it is very interesting and useful

service. However, it has limited access in rural area. They said it allows conducting transactions sitting at your own place anywhere, the user need not go to bank for transactions. Also, it was deemed as more safe and secure. In fact, getting cash from ATM is long procedure then using mobile banking. They expressed that the transactions using mobile banking are very clear and there is no need to carry cash. Some people highlighted concerns on use of mobile banking at local providers and stalls such as at momo stalls do not accept payments through m-banking. They revered the benefits offered by mobile banking such as can make payments from anywhere and anytime which makes it convenient, easy to use, secure, free from fraudulent, has more transparency and accountability. Therefore, it was deemed trustworthy. They opined that it allows them to do cashless transactions and offers time, convenience and fast transfer of funds.

The respondents said that using mobile banking makes it easy to view their transactions, enables tracking of the transactions they make. Also, they are well informed on their banking status as they get message on every transaction that is conducting on their account. Hence there are less chances of fraud and high accountability as it is secured with passwords. They get money back if any transaction declines, they get multiple options, phonebook access facility and can even do transactions offline using BHIM app by Indian government. The respondents shared views that though it offers reliability, easy to track transactions, provides immediate information on mobile after any transaction done, however for bigger transactions traditional banking is preferred.

2. *What was your experience on using mobile banking technology?*

While sharing their experiences on using mobile banking, the mixed responses were garnered. Some responses highlighted on the negative experiences such as “I had bad experience, wasted Rs 130 by purchasing e-book actually I was not aware that the book is not paper book it was actually e-book”. “I faced technical problem; my money got paid twice”. “I had mobile recharge failure, money got deducted from my account but recharge did not happen. The positive experience was that I got cashback.” “I did my first transaction of Rs 10 only as I was in doubt and was not feeling secure”.

While there were positive responses highlighted on the respondent's favorable experiences. "I lost my wallet and had no money so I asked a friend to send money to my e-wallet. So, used it for the first time. It was easy and convenient". "My first experience was a little doubtful but exciting".

"It is easy and safe, digital payment has become youth friendly, the problem to carry cash is eliminated". "There are huge offers when using wallets, cashbacks and positive experiences". "I do not have a card(debit/credit) so using mobile banking I can do all the transactions without a card also"." I had great experience using m-banking, it was easy, safe and secure". "I did my first mobile recharge at midnight when all the shops were closed. It was easy to use, fast and secure". "I need not go to vendor office for payment; it saves me time and money".

3. *For what purposes would you use mobile banking the most?*

The responses on the purposes of using mobile banking were multiple that included using it for online shopping, digital wallets, paying electricity bill. Making payments for telephone bills, electricity bills. So, respondents shared they used mobile banking for conducting day to day transactions such as paying for bills. While other respondents expressed, they used mobile banking for mobile recharge and payment of wi-fi bills.

4. *What is one thing you would like to change in mobile banking?*

On seeking the suggestions for enhancing their use experience, the change in technology they seek was majorly related to its security and need for more flexibility. The respondents highlighted the need to reach to the rural people as they still have limited access. Moreover, the respondents shared that there are certain problems such as system failures while doing transactions that need to be addressed. Some respondents expressed need for credit facility. They also stated that the basic mobile phones should also support services such as

mobile banking. In case of issues, technical support should be provided. It should be made more safe, secure, convenient. The respondents highlighted on refunds also as an issue. The banks should provide technical support, the illiterate and rural people do not know how to operate it. Providers should make it convenient to be used on feature phones apart from smartphones. They should increase the maximum limit for transactions per day. Sometimes there are delay in repayment of money so need to reduce time for its processing. The local thelawalas and stalls keepers should also be trained on using these services and also providing alternate channel for payment for its customers.

As discussed, the students showed liking towards the features such as ease of payment of bills and feasibility for transactions at most of the providers at any time. Even though they demonstrated feelings of trust, they do express concerns related to technical support and security interventions required from the provider and government side.

B. Working Professionals Interviews

1. *What do you feel with the mention of mobile banking?*

   The respondents shared their views regarding mobile banking from awareness of the technology to its use. “It helps me in conducting my transactions. It has provided a very useful way to make payments”. Some respondents expressed their concern regarding the availability and support of the service at all places. “It is still difficult to use such as digital wallets at many places such as retailer in my locality”. The respondents also shared their concerns regarding mobile banking. “I am not sure about my data and money security”. Others were more comfortable with the traditional banking mode. “I prefer conventional banking”. The respondents with positive experiences also shared their views. “Mobile banking is useful and Convenient”. “It is more secure as in electronic form as compared to physical money. Data security is ensured. We just need to be cautious by refraining from sharing our details. It keeps track of my family expenses”. “It is very fast processing and smart”.

2. *What was your experience on using mobile banking technology?*

The experiences shared by the working professionals majorly circled around the usability and convenience feature of mobile banking both in terms of positive and negative experiences. "I consider traditional payment system better in scenarios when the transactions fail while making digital payments. However, within moments I receive intimation on the payment failure which relieves me of the worries". "I was skeptical initially now I find it easy to use". "I experimented initially, found it convenient and easy to use. I use it more often now.

3. *For what purposes would you use mobile banking the most?*

The respondents shared the places they have used mobile banking that ranged from booking tickets, making utility bill payments, payment of fees and doing money transfers.

4. *What is one thing you would like to change in mobile banking technology?*

The major areas of concerns that the working professionals expected to be addressed included security, wider acceptance and availability. Connectivity issues and policies by regulators on money transfers.

To summarize the working professionals, have more inclination towards the usefulness and convenience of the mobile banking. Though they do share few concerns related to the security of the technology, but their attitude is positive towards the features such as ease of use, usability and trust on the provider. Even though they demonstrate feelings of trust, they do express concerns related to regulatory interventions required from the provider and government side.

C. Interview with the Bank Managers

Major discussion Points

1. Which technology-based services are offered to bank customers?

2. Why did you start this new service system?
3. Which difficulties did you experience (customer specific) in getting started?
4. Which were the major technological difficulties (regarding customers) encountered?
5. What kind of issues customer face in using m-banking
6. How are customers motivated to use mobile banking?
7. What do you think are the advantages for customer in using mobile banking?
8. What do you think are the disadvantages for customer in using mobile banking?
9. Which benefits do you think it offers to customer?
10. Has the bank become more profitable since introducing mobile banking (In Operations)?

The interviews were conducted with the leading banks, one from the private and one from the public bank manager to ensure that the opinions are relevant to all segments of the society. The private bank was the leading private bank, HDFC and interview was conducted with the bank branch manager. The public bank taken the leading public bank, Central bank of India and the interview was conducted with the Manager, retail banking. The responses to the interview questions are discussed as follows:

a) *Which technology-based services are offered to bank customers?*

The managers of both the bank stated that the major technology-based services offered to the customers included ATM services, SMS (short message service) banking, Internet banking and Mobile banking

b) *Why did you start this new service system?*

The primary reason for the private bank offering these services was to provide customer convenience along with intent to attain competitive advantage and also to improve the technology. In addition, less cost and saving time for both customers and bank was the thought behind offering mobile banking. The public bank's major reasons were to handle the competition faced from other nationalized banks. Also, they were witnessing new types of trends in customer requirements so to cater to the diverse and changing needs of the customer they roped in mobile banking technology. In addition, they intended to achieve minimal customer crowd in the bank branches, have less or no queues and offer customer convenience.

c) Which difficulties did you experience (customer specific) in getting started?

The challenges faced by private bank included the customer's own personal reasons for not adopting mobile banking. Also, there were disparities in behavior of different segments of the customers such as the older people mostly feel comfortable visiting bank branch to do banking.

The public bank cited lack of knowledge as major issue faced by customer in adopting mobile banking. The younger customers are more inclined as compared to the older clients. Another challenge was the network problems. Moreover, the customers using old technologies like ATM; feel comfortable using that without mobile banking.

d) Which were the major technological difficulties (regarding customers) encountered?

The technological difficulty faced by customers of private bank was resistance towards change. Age was another reason highlighted that inhibits people's adoption of mobile banking. The public bank cited the network problems as common customer's concern along with issues related to privacy, security and technical. The users who were literate were believed to be more trusting.

e) What kind of issues customer face in using m-banking

The major issue highlighted by private bank that customers face was loss of password. Also, RTGS/NEFT services are not available on holidays.

The issues highlighted by public bank included lack of knowledge. Moreover, the public bank customers have more preference towards traditional mode of banking than mobile banking as the transactions in mobile banking are virtual in nature so they cannot see the conduct of money transactions. In addition; loss of physical device, network issues and culture were more issues.

f) How are customers motivated to use mobile banking?

The private bank manager reported the major motivation to use mobile banking was that they were driven by their own beliefs and needs.

The public bank on the other side stated that it is bank branch employee's responsibility to make every customer visiting branch aware and promote its benefits, the convenience it offers and 24X7 availability of services. The companies are aggressively following their customers; all major competitor banks such as SBI, PNB and online providers like Paytm, Amazon with wallet services.

g) What do you think are the advantages for customer in using mobile banking?

Both the banks believe that convenience, cost effectiveness and instant processing are the advantages for customer for using mobile banking.

h) What do you think are the disadvantages for customer in using mobile banking?

Private bank manager states that own due diligence is the disadvantage for customer in using mobile banking. Public bank manager states that the security in any type of loss may be misused acts as the disadvantages for customer in using mobile banking.

i) Which benefits do you think it offers to customer?

Both bank managers stated that saving on customer's time, enabling cost effectiveness and access to information are primary benefits provided to the customer. In addition, the private bank manager states that the benefit they offer to the customer are good relationship building with the bank in offering services, support and more benefits are provided to the customer. Public bank manager states that the through technologies like mobile banking they are able to reduce crowd in the bank. The customer can perform transactions in one click at his home for what he spent two hours travelling all the way to bank. It also allows the reduction of load on the bank officials and hence they can concentrate on other important tasks. Banks can get commission on activities like paying customer bills of certain types, so they can focus on those, no fees no charges etc.

j) Has the bank become more profitable since introducing mobile banking (In Operations)?

Both bank managers agree as the cost efficiencies lead to more revenue. Public bank managers however states that though it does lead to more revenue but it would be too early to say by how much but definitely results are positive.

Summary: The interviews with the bank managers reiterated the significant impact of usefulness and ease of use feature of the mobile banking that makes it highly potential and useful technology to bring about the radical change in the way banking transactions are conducted. Besides offering value to customers, mobile banking leads to generation of profits for the banks. However, the most critical challenge that was stated was trust. The security concerns are the major issues that are causing the major inhibition in adoption of mobile banking. Few other challenges identified by the bank managers were technology use and due diligence.

5.5.3 Qualitative Study Summary Analysis

The focus group gave overview of the major factors and concerns regarding mobile banking. With reference to the TAM model, the factors perceived usefulness and perceived ease of use showed significant influence on the perceptions of respondents towards their use of adoption of mobile banking. The students show liking towards the features such as ease of payment of bills and feasibility for transactions at most of the providers at any time. The working professionals have more inclination towards the usefulness and convenience of the mobile banking. However, the respondents also showed a strong influence of trust in the preference towards mobile banking. The students do express concerns related to security. Likewise, the working professionals showed the concerns related to data security and privacy. The need for interventions from the provider as expressed by the respondents could establish their trust on technology.

The interviews with the bank managers reiterated the significant impact of usefulness and ease of use feature of the mobile banking. However, the security concerns are the major issues that cause the major inhibition in adoption of mobile banking.

On basis of the exploratory study conducted, it was established that the TAM model though a highly explanatory model is required to be extended for its appropriate application in the Indian context. Henceforth, the research proposes extended TAM model with addition of another variable, trust, to study its application derived on basis of extensive literature review and qualitative research conducted as the conceptual model for the study. In order to establish the relevance and applicability of the proposed model, quantitative research is conducted and results are reported in next section of the report.

5.6 The Conceptual Model:

On the basis of the qualitative study conducted, the present research proposes the following framework:

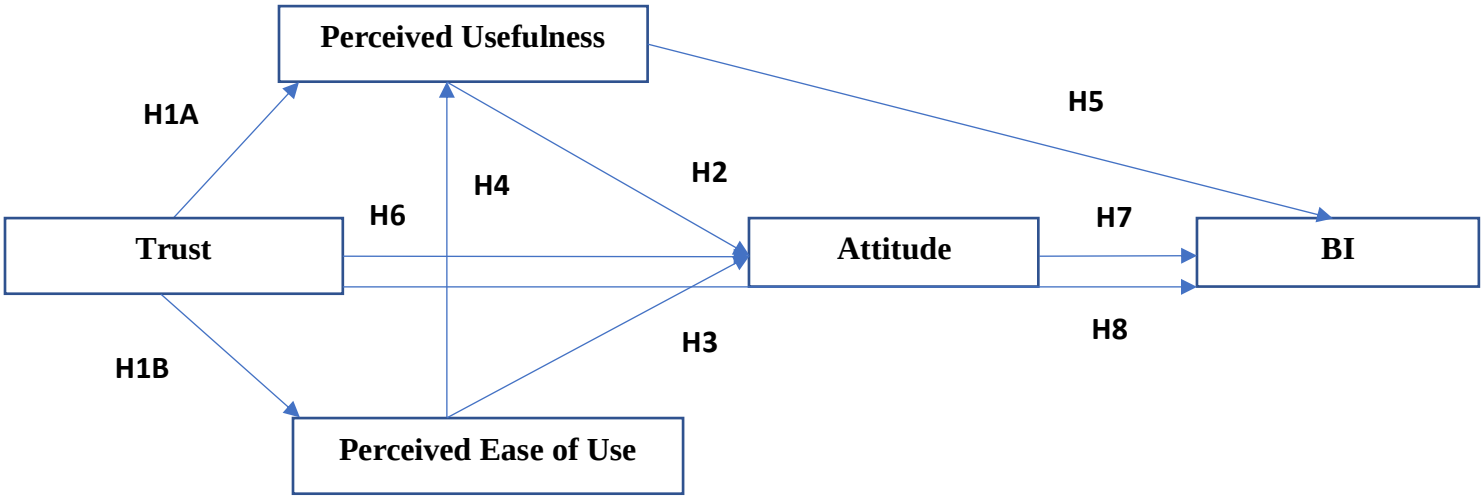


Figure 5.2: Conceptual Framework

5.7 **Research Hypothesis:**

The hypotheses proposed for the present research are as following:

H1A: Trust influences perceived usefulness towards mobile banking adoption

H1B: Trust influences perceived ease of use towards mobile banking adoption

H2: Perceived usefulness influences attitude towards mobile banking adoption

H3: Perceived ease of use influences attitude towards mobile banking adoption

H4: Perceived ease of use influences perceived usefulness towards mobile banking adoption

H5: Perceived usefulness influences intention towards mobile banking adoption

H6: Trust influences attitude towards mobile banking adoption

H7: Attitude influences intention towards mobile banking adoption

H8: Trust influences intention towards mobile banking adoption

$H9_0$: There is no significant relationship between factors influencing mobile banking adoption decision and the demographics

As the demographic factors are captured into four variables, therefore following sub hypothesis are formulated to examine their impact on mobile banking adoption

H9.1: There is no significant influence offender on the intention to use mobile banking.

H9.2: There is no significant influence of age on the intention to use mobile banking.

H9.3: There is no significant influence of income on the intention to use mobile banking.

H9.4: There is no significant influence of occupation on the intention to use mobile banking.

5.8 Quantitative Analysis

5.8. 1 Exploratory Factor analysis

OBJECTIVE 1:

To Investigate the Adoption of Mobile Banking in The Indian Context.

EFA followed by Confirmatory factor analysis (CFA) and Structured equation modelling for Path Analysis was performed with SPSS 19.0 using AMOS to investigate the adoption of mobile banking in the Indian context. Following the structured equation modelling approach, the research methods follow the two-step approach suggested Anderson and Gerbing [440]. The step one is to assess the measurement model and examine the reliability and validity. Step two in the approach is to assess the structural model. In this step the hypothesis of the study is tested by observing the magnitude and direction of the relationship between variables and their level of significance.

Exploratory Factor Analysis:

The Exploratory Factor analysis (EFA) permits us to get preliminary approximation of the measurement items for each variable in the proposed model. In addition, it performs the reliability estimation and identification of differences in the scale items that provides the converging validity of the scale.

To examine the quality of the proposed adoption model, EFA was performed to measure the scale items. It was performed to determine the items that have a high impact on their respective variables [427] and to reduce the number of scale items. The EFA was carried out using SPSS 19.0. The extraction method employed was principal component axis, as it is recommended as the most appropriate and widely used method to determine the constructs. EFA was performed for every construct in the model using Varimax Rotation to find whether or not the scale possessed uni-dimensionality [441, 442] and is free from multicollinearity. In this study, EFA was conducted on the five variables - perceived usefulness, perceived ease of use, trust, attitude and behavioral intention. The variables consisted of 21 items. The outcome of the KMO and Bartlett's Test in factor analysis is summarized in Table 5.9.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.919
Bartlett's Test of Sphericity	Approx. Chi-Square	5381.651
	df	78
	Sig.	.000

Table 5.9- KMO and Bartlett's Test

The EFA outcome showed that the scale possessed uni-dimensionality with regard to all constructs in the model. The KMO value was 0 .919. The value of KMO desired must be .60 or higher for good factor analysis [429]. Therefore, the factor analysis was appropriate for use.

Variables	Original Items	Deleted Items	Actual Items
PEOU	7	5	2
PU	5	3	2
Trust	3	0	3
Att	3	0	3
BI	3	0	3

Table 5.10 - EFA Variable Outcome

Note:

PEOU=Perceived Usefulness; PU=Perceived Ease of Use; Att= Attitude; BI= Behavioral Intention

Some of scale items PE0U1, PE0U2, PE0U4, PE0U6, PE0U7 and PU1, PU3, PU5 exhibited low factorial values and hence were eliminated from the model.

	Initial	Extraction
Att1	1.000	.822
Att2	1.000	.825
Att3	1.000	.814
Trust1	1.000	.700
Trust2	1.000	.840
Trust3	1.000	.762
BI1	1.000	.745
BI2	1.000	.802
BI3	1.000	.751
PU2	1.000	.642
PU4	1.000	.878
PEOU5	1.000	.559
PEOU3	1.000	.893

Extraction Method: Principal Component Analysis.

Table 5.11-Communalities

The communalities of the factor analysis (Table 5.11) that measure the minimum loadings needed by an item for inclusion in its respective construct are desired to be higher than 0.30 for satisfactory values and 0.5 or higher for highly significant values [432]. In the present research items having loadings of 0.5 or higher are included in the construct.

Rotated Component Matrix [a]

	Component				
	1	2	3	4	5
Att1	.816				
Att2	.812				
Att3	.784				
Trust1		.756			
Trust2		.875			
Trust3		.786			
BI1			.781		
BI2			.811		
BI3			.756		
PU2				.537	
PU4				.884	
PEOU5					.439
PEOU3					.912

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Table 5.12- Rotated Component Matrix

EFA conducted seven iterations to perform factor analyses. Total 5 constructs were extracted. These 5 constructs gave 77.18 percent of the total variance.

5.8. 2 Measurement Model:

The measurement model evaluated the reliability and validity of the research model by using the criteria specified by Fornell and Larcker [443]. Reliability analysis was conducted by observing the measures of Cronbach alpha

A. Reliability Analysis:

The multiple item scale was evaluated for its reliability. Reliability is defined as "the ability of the scale to consistently measure the phenomenon it is designed to measure, which is an essential precondition for the instrument validity" [444].

Cronbach's alpha, that examines the internal consistency of the items in a variable, was calculated for every variable for testing the model construct's reliability.

Table 5.13 shows the Cronbach alpha values ranges from 0.535 to 0.896, which falls in the acceptable range according to Nunnally [445].

Factor	**Reliability (Cronbach α)**
Perceived Ease of Use	.535
Perceived Usefulness	.588
Trust	.844
Attitude	.896
Behavioral Intention	.847

Table 5.13: Reliability Analysis

Since values of Cronbach's alpha lie in the acceptable range the variables are considered to possess appropriate reliabilities to move forward towards the next phase which is validity analysis.

B. Validity Analysis:

To ascertain the model validity, the three measures were undertaken that were content validity, convergent validity and discriminant validity.

a. Content Validity:

Content validity evaluates the extent to which the contents of the measurement items are able to depict the measured variable [424]. Hence it employs technique that is qualitative in nature. The extensive review of literature on technology adoption, mobile banking and trust-based studies was carried to identify and incorporate the appropriate scale and items. In addition, pilot test was conducted to validate the scale items and comparisons with the students and working professionals to establish the content validity.

b. Convergent validity:

Convergent validity specifies the correspondence of measurement items to their factors and discriminant validity computes the statistical differences between the factors, if any [446]. Fornell and Larcker, [443] suggested that average variance extracted should be used to indicate the convergent validity of the variables in the model. Table 4.13 shows the average variances extracted (AVE) and composite reliability (CR). The value of AVE measured for all factors was greater than 0.5 and CR values were higher than 0.7. Therefore, the present scale exhibited strong convergent validity [193].

Construct	CR	AVE
Attitude	0.896	0.741
PEOU	0.873	0.579
PU	0.757	0.609
TRUST	0.849	0.652
BI	0.852	0.658

Table 5.14**:** Average variances extracted (AVE) and composite reliability (CR)

c. Discriminant validity:

Discriminant validity is computed by comparing square root of AVE with the correlation coefficient of the factors. As shown in table 5.15 the value of square root of AVE for every factor comes out to be higher than its corresponding correlation coefficient with other factors. Hence, it shows strong discriminant validity [443, 193].

	Attitude	**PEOU**	**PU**	**TRUST**	**BI**
Attitude	***0.861***				
PEOU	0.601	***0.761***			
PU	0.694	0.82	***0.780***		
TRUST	0.609	0.638	0.677	***0.808***	
BI	0.767	0.582	0.589	0.572	***0.811***

Table 5.15**:** Discriminant Validity

C. CFA Model Fit Summary

All standardized loadings were more than 0.70. Also, AVE values for all the latent constructs was above the values of inter-construct correlations [443]. Therefore, the discriminant validity and convergent validity were successfully achieved.

For model fit summary, as shown in the table 5.16, the indicators suggested a strong model fit (CMIN/DF =1.449, RMR = .031, CFI = .996, TLI= .993, RMSEA = .024). In addition, all unstandardized estimates for all observed variables were found significant.

CMIN/DF	**RMR**	**CFI**	**TLI**	**RMSEA**
1.449	.031	.996	.993	.024

Table 5.16: CFA Model fit Summary

5.8.3 Structural Model: Path Analysis

i. SEM Model Fit Summary

Further to the measurement model, second step was to perform path analysis and test the model hypotheses [440]. As suggested by Gefen et al. [193], there should at least a sample of 100–150 respondents for conducting the structural equation model (SEM) the present study has 793 respondents, so the sample size was appropriate for SEM. SEM was done using Amos 16.

As shown in the table 4.16, the actual and recommended values of model fit indices are reported. The indicators suggested a strong model fit (CMIN/DF =1.449, RMR = .031, CFI = .996, TLI= .993, RMSEA = .024). In addition, all unstandardized estimates for all observed variables were found significant. The values of fit indices were significantly good and below the recommended values. This confirmed a good model fit between the model and the data [193].

Recommended and Actual values of Fit Indices					
	CMIN	**RMR**	**CFI**	**TLI**	**RMSEA**
Actual values	1.449	.031	.996	.993	.024
Recommended Values	<4	<.08	>0.9	<0.90	*>0.8*

CMIN is ratio between chi square and degrees of freedom; RMR is Root mean squared residual
GFI is goodness of fit index; CFI is Comparative fit index; RMSEA is Root mean square of estimation

Table 5.17: Recommended and Actual values of Fit Indices

ii. Path Diagram:

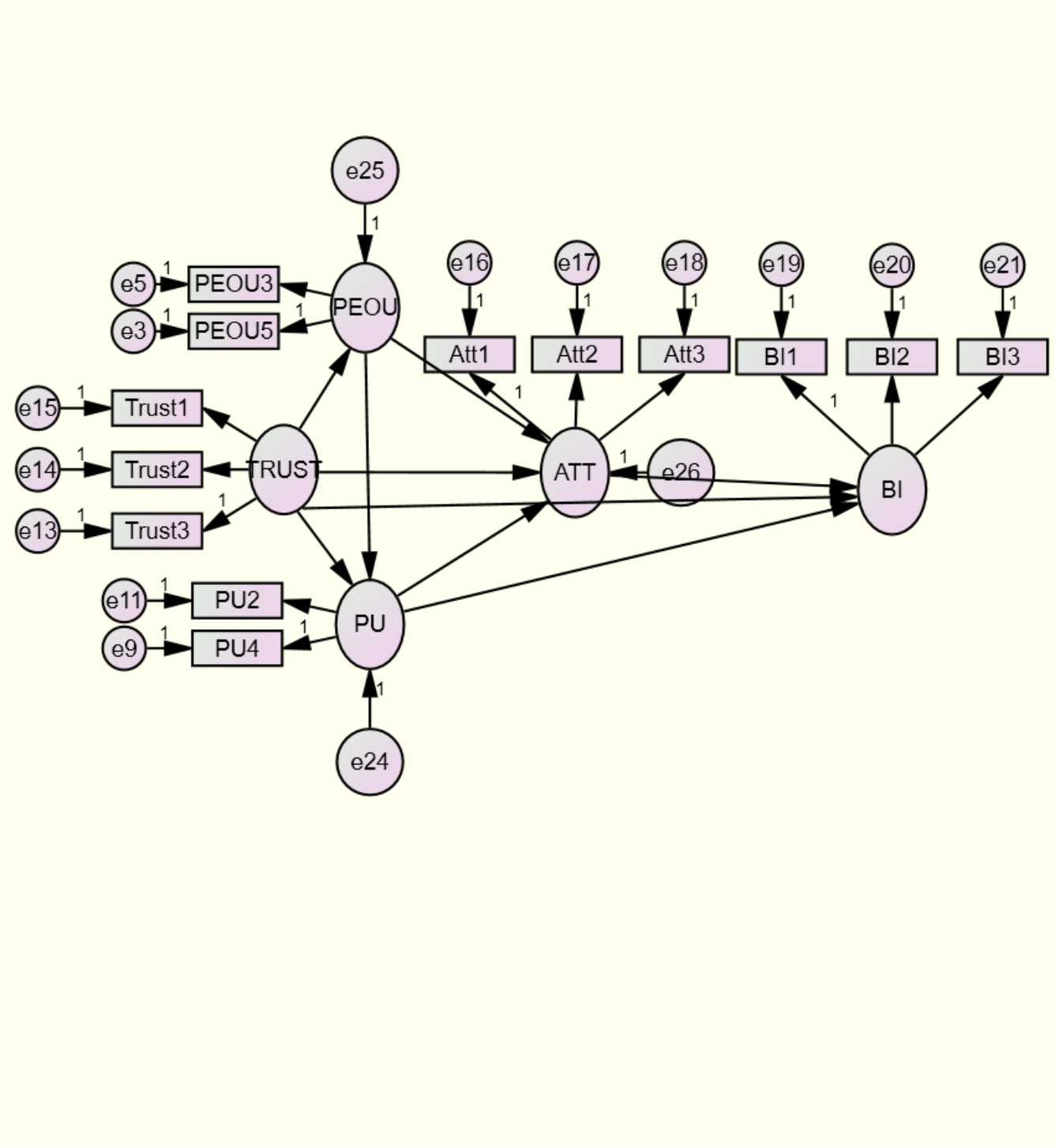


Figure: 5.1: Path Diagram

iii. Path Analysis Results

Estimate			Regression Wts	P	Result
PU	<---	*TRUST*	*0.092*	*0.227*	*Not Supported*
PEOU	<---	TRUST	0.619	***	Supported
Attitude	<---	PU	0.865	0.027	Supported
Attitude	<---	*PEOU*	*-0.105*	*0.722*	*Not Supported*
PU	<---	PEOU	0.654	***	Supported
BI	<---	PU	0.353	***	Supported
Attitude	<---	TRUST	0.122	0.043	Supported
BI	<---	Attitude	0.547	***	Supported
BI	<---	*TRUST*	*0.038*	*0.411*	*Not Supported*

Table 5.18: Path Analysis

iv. Discussions

The second step of data analysis for testing the structural model, as suggested by Anderson and Gerbing [440], the data was analyzed using SPSS V19. It was assessed on basis of three conditions. These three conditions to evaluate the research model were, assessing the path coefficients, path significance (the value of p must be less than 0.05) and coefficient of determination of the endogenous variable. The endogenous variable in the research model was behavioral intention. Examination of these conditions provided the outcomes of test for the proposed hypotheses of this study. Table 5.18 shows the values of the path coefficients, significance values of relationships of the constructs and respective hypothesis given in the study. Based on the test results, trust did not show statistically significant influence on PU hence hypothesis H1A was not supported. The impact of trust on PEOU was, however, was found to be significant with p values less than .05 that supported the hypothesis H1B. Also, PU was found to be statistically significant in predicting the attitude and intention having p value less than 0.01, thus supporting hypotheses H2 and H5. PEOU did not demonstrated influence on attitude thus not supporting hypothesis H3, however PEOU was statistically significant in predicting PU with

p value less than 0.01, thus supporting hypotheses H4. Likewise, Trust was found to be statistically significant in predicting the attitude respectively with p value less than 0.01, thus supporting hypotheses H6, likewise attitude was statistically significant in predicting behavioral intention with p value less than 0.01, thus supporting hypotheses H7. On the contrary, the effect of trust on behavior intention was not found to be statistically significant, thus not supporting hypothesis H8. Overall, out of the nine hypotheses formulated, six were supported by the data collected and three were not supported.

5.8.4 Analysis of Demographic Factors

OBJECTIVE 2:

TO ASCERTAIN THE DEMOGRAPHIC FACTORS THAT INFLUENCES THE DECISION TO USE MOBILE BANKING IN INDIAN YOUTH

To analyze the stated objective, the study of relationship between the demographics and the model constructs the following hypothesis was stated:

$H9_0$: There is significant influence of demographic factors on mobile banking adoption

H9.1: There is no significant influence of gender on the intention to use mobile banking.

H9.2: There is no significant influence of age on the intention to use mobile banking.

H9.3: There is no significant influence of income on the intention to use mobile banking.

H9.4: There is no significant influence of occupation on the intention to use mobile banking.

The hypothesis was tested by applying One-way ANOVA (analysis of variance) and Independent sample t-test based on the presence of number of groups. ANOVA technique basically examines if there exists a significant difference amid two or more groups. T- test, o the other hand, is a technique which examines the difference between two groups. Amongst the demographic variables, gender and professions consisted of only two groups each whereas age and income

comprised of more than two groups. Therefore, T-test was used for gender and profession whereas ANOVA method was used for the other demographic variables.

1. **Gender and BI:** Independent sample T test examined the gender and intention relationship

H9.1: There is no significant influence of gender on the intention to use mobile banking.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
BI	Male	550	5.5913	1.04670	.04463
	Female	243	5.7218	1.01938	.06539

Table -5.20 a: Gender-BI T test Group Statistics

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
BI	Equal variances assumed	.133	.716	-1.632	791	.103	-.13052	.07999	-.28753	.02650
	Equal variances not assumed			-1.648	474.575	.100	-.13052	.07917	-.28609	.02506

Table -5.20 b: Gender-BI T test Independent Samples Test

At 95 per cent of confidence, the results as shown in table 5.20a provided value for Male group of (M=5.5913, SD=1.04670) and for the Female group (M=5.7218, SD=1.01938).The test results indicated that t (791) = -1.632, p = .103, there was significant difference between the groups. Hence the gender does not have a significant impact on behavioral intention. The analysis signified that the difference in age do not show a difference in the intention for adoption of mobile banking, hence null hypothesis is accepted.

2. Gender and Attitude

Independent sample T test was conducted to examine the relationship between gender and attitude towards adoption.

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
attitude_mean	Male	550	5.7171	1.02034	.04351
	Female	243	5.8963	1.00965	.06477

Table -5.19 a: Gender-Attitude T test Group Statistics

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
attitude_mean	Equal variances assumed	.238	.626	-2.286	791	.022	-.17913	.07834	-.33292	-.02534
	Equal variances not assumed			-2.296	467.689	.022	-.17913	.07803	-.33245	-.02580

Table -5.19 b: Gender-Attitude T test Independent Samples Test

At 95 per cent of confidence, the results as shown in table 5.19a provided value for Male group of (M=5.717, SD=1.02034) and for the Female group (M=5.8963, SD=1.00965).The test results as shown in table 5.19b indicated that t (791) = -2.286, p = .022, there was significant difference between the groups. Hence the gender really has a significant impact on attitude. The results suggested that gender does have an impact on the attitude to adopt mobile banking.

3. Age and Attitude

To examine the relationship between Age and Attitude, one-way Anova test was conducted. The test results as shown in the table below reported the mean differences and standard deviation for the age groups under the study.

Descriptive

Attitude

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18-21	134	5.6949	.88275	.07626	5.5441	5.8458	3.00	7.00
22-25	203	5.8181	1.01143	.07099	5.6782	5.9581	1.33	7.00
26-30	185	5.7604	1.01553	.07466	5.6131	5.9077	2.33	7.00
31-35	271	5.7835	1.09262	.06637	5.6528	5.9142	1.00	7.00
Total	793	5.7720	1.01980	.03621	5.7009	5.8431	1.00	7.00

Table -5.21a: Age and Attitude ANOVA Descriptive

The analysis suggested that at 95 per cent confidence level, there existed no statistically significant difference between the groups as found by the one-way Anova (F (3,789) = .412, p = .744)").

ANOVA

Attitude

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.289	3	.430	.412	.744
Within Groups	822.379	789	1.042		
Total	823.667	792			

Table -5.21b: Age and Attitude ANOVA

Therefore, it can be concluded that the age do not have significant influence on the attitude towards adoption.

4. **Age and BI:** To examine the relationship between Age and behavioral intention, one-way Anova test was conducted to test the below stated hypothesis.

H9.2 There is no significant influence of age on the intention to use mobile banking.

Descriptive

BI

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
18-21	134	5.5505	.94561	.08169	5.3889	5.7121	3.33	7.00
22-25	203	5.6644	1.02097	.07166	5.5231	5.8057	1.67	7.00
26-30	185	5.6035	1.02139	.07509	5.4554	5.7517	2.00	7.00
31-35	271	5.6652	1.11026	.06744	5.5325	5.7980	1.00	7.00
Total	793	5.6312	1.03951	.03691	5.5588	5.7037	1.00	7.00

Table -5.22a: Age and BI ANOVA Descriptive

The analysis suggested that at 95 per cent confidence level, there existed no statistically significant difference between the groups as found by the one-way Anova (F (3,789) = .478, p = .698).

ANOVA

BI

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.552	3	.517	.478	.698
Within Groups	854.264	789	1.083		
Total	855.817	792			

Table -5.22 b: Age and BI ANOVA

Therefore, it can be concluded that the age does not have significant influence on the adoption intention hence null hypothesis was accepted. The intention towards mobile banking adoption across age groups remained homogenous.

5. Income and Attitude

To examine the relationship between Income and Attitude, one-way Anova test was conducted. The test results as shown in the table below report the mean differences and standard deviation for the income groups under the study.

Descriptive

Attitude

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	190	5.7898	.87016	.06313	5.6653	5.9144	3.33	7.00
2.00	221	5.7248	1.03009	.06929	5.5882	5.8614	2.00	7.00
3.00	184	5.8264	1.05993	.07814	5.6722	5.9805	2.33	7.00
4.00	140	5.8480	1.05605	.08925	5.6715	6.0245	1.00	7.00
5.00	58	5.5378	1.19521	.15694	5.2235	5.8520	1.33	7.00
Total	793	5.7720	1.01980	.03621	5.7009	5.8431	1.00	7.00

Table -5.23a: Income and Attitude ANOVA Descriptive

The analysis suggested that at 95 per cent confidence level, there existed no statistically significant difference between the income groups as found by the one-way Anova ($F(4,788) = 1.224$, $p = .299$).

ANOVA

Attitude

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.088	4	1.272	1.224	.299
Within Groups	818.580	788	1.039		
Total	823.667	792			

Table -5.23 b: Income and Attitude ANOVA

Therefore, it can be concluded that the income does not have significant influence on the attitude towards adoption.

6. **Income and BI:** To examine the relationship between Income and behavioral intention, one-way Anova test was conducted to test the stated hypothesis. The test results as shown in the table below reported the mean differences and standard deviation for the income groups under the study.

H 9.3: **There is no significant influence of income on the intention to use mobile banking**.

Descriptive

BI

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	190	5.5749	.98129	.07119	5.4345	5.7153	1.67	7.00
2.00	221	5.6083	1.05753	.07114	5.4681	5.7485	2.00	7.00
3.00	184	5.6052	1.06999	.07888	5.4496	5.7609	2.00	7.00
4.00	140	5.7946	1.06831	.09029	5.6161	5.9732	1.00	7.00
5.00	58	5.5914	.98190	.12893	5.3332	5.8496	2.67	7.00
Total	793	5.6312	1.03951	.03691	5.5588	5.7037	1.00	7.00

Table -5.24a: Income and BI ANOVA Descriptive

The analysis suggested that at 95 per cent confidence level, there existed no statistically significant difference within groups as found by the one-way Anova ($F(4, 788) = 1.082$, $p = .364$).

ANOVA

BI

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.674	4	1.169	1.082	.364
Within Groups	851.143	788	1.080		
Total	855.817	792			

Table -5.24b: Income and BI ANOVA

Therefore, it can be concluded that the income does not have significant influence on the adoption intention. Therefore, the intention for adoption was not perceived differently by people in different groups.

Demographic Results Summary:

The impact of all the demographic variables on the significant factors of adoption was calculated. The comprehensive demographic analysis thus conducted, is presented in the table format in Table 5.25.

While conducted the analysis, the data was assessed for its normalcy and homogeneity of variance was checked using Levene's statistic as shown in the table 5.25. Post-hoc tests (Tuckey/Games Howell) were also conducted to draw deeper insights into analysis when there was significant relationship.

		Gender	Age	Profession	Annual Household Income
PU	Levene Statistic	.052	4.687	46.710	7.167
	Levene Sig.	.820	.003	.000	.000
	ANOVA F Statistic		1.576		1.432
	ANOVA Sig.		.194		.222
	t- statistics	.123		.510	
	t-sig	.902		.482	
	Ho Rejected	**No**	**No**	**No**	**No**
PEOU	Levene Statistic	1.225	3.600	67.525	8.248
	Levene Sig.	.269	.013	.000	.000
	ANOVA F Statistic		3.640		1.226
	ANOVA Sig.		.013		.298
	t- statistics	1.245		-1.521	
	t-sig	.214		.129	
	Ho Rejected	**No**	**Yes**	**No**	**No**
Trust	Levene Statistic	.407	1.522	4.038	2.965
	Levene Sig.	.524	.208	.045	.019
	ANOVA F Statistic		2.338		.875

	ANOVA Sig.		.072		.478
	t- statistics	.168		-4.230	
	t-sig	.866		.000	
	Ho Rejected	**No**	**No**	**No**	**No**
Attitude	Levene Statistic	.238	.852	1.887	1.869
	Levene Sig.	.626	.466	.170	.114
	ANOVA F Statistic		1.810		1.224
	ANOVA Sig.		.144		.299
	t- statistics	-2.286		-.865	
	t-sig	.022		.063	
	Ho Rejected	**Yes**	**No**	**No**	**No**
BI	Levene Statistic	1.336	1.122	.050	.903
	Levene Sig.	.248	.339	.822	.462
	ANOVA F Statistic		.734		1.082
	ANOVA Sig.		. .532		.364
	t- statistics	.612		-3.770	
	t-sig	.541		.000	
	Ho Rejected	**No**	**No**	**Yes**	**No**

Table 5.25: Relationship between the demographics and the model constructs

Source: Primary data collected through questionnaire

"Levene's test is used for determining the homogeneity of variances. In the given table, the significance value of Levene's test is shown. If this significance value is less than 0.05, the null hypothesis of equal variances is rejected" [447].

"ANOVA test indicates whether there was an overall difference between the groups. However, it can only be used if the data meet the assumption of homogeneity of variance (as indicated by Levene's test). If the data do not satisfy the assumption of homogeneity of variance, Welch F-test is used to identify the overall difference between the groups. The t-test is used to find the difference between the groups, when the groups are limited to two. In this case for "gender" and "marital

status", t-test is run as groups are only two. If the groups exceed two, then ANOVA is used. The statistics in this row relate to ANOVA or Welch F or t-test as applicable under the given constraints" [448]. "The significance value given in this row is used to accept or reject the null hypothesis tested using ANOVA or Welch or t-test" [449].

I. **Perceived ease of Use and Age:** Based on the one-way Anova test, homogeneity of variance assumption was not met. Therefore, the Welch test F statistic was conducted. The test reported that there was no statistically significant difference between groups as found by Welch ($F(3,416.716) = 3.361$, $p = 0.019$). Hence the null hypothesis could be rejected. The Games-Howell post-hoc test does not depend on homogeneity of variance therefore this test was selected. This test discovered that perceived ease of use is for individuals in the age group 22-25 years ($5.72 \pm .87$) is higher than the individuals in the age group 31-35 years (5.46 ± 1.10). Hence the results may conclude that for the present research data, the relationship between perceived ease of use and age group exists. It can be inferred as people belonging to younger age group consider that perceived ease of use significantly influenced their adoption of mobile banking.

II. **Behavioral Intention and Profession:** On basis of the independent sample t test($t = -3.770$, $p=.000$) confirmed that there is a relationship between behavioral intention and profession. Moreover, the descriptive analysis yielded that the behavioral intention for working professionals (5.79 ± 1.06) than the students (5.51 ± 1.01) Hence the results may conclude that for the present research data, the relationship between perceived ease of use and age group existed. It can be inferred as people belonging to younger age group considered that perceived ease of use significantly influenced their adoption of mobile banking. Therefore, it could be inferred that working professionals consider behavioral intention as a strong influencer in the adoption of the mobile banking.

III. **Attitude and Gender:** Based on independent sample T test, at 95 per cent of confidence, the results indicated that $t (791) = -2.286$, $p = .022$, there was significant difference between the groups. Hence the gender really has a significant impact on attitude. The results suggested that gender does have an impact on the attitude to adopt mobile banking.

5.8.5 TAM model Efficacy

OBJECTIVE 3:

TO EVALUATE WHETHER THE TAM MODEL PROVIDES A SOLID THEORETICAL BASIS FOR EXAMINING THE ADOPTION OF MOBILE BANKING IN THE INDIAN CONTEXT.

TAM has been invariably applied across diverse settings to check its applicability for examining the acceptance of IS/IT systems. The present research supported the applicability of TAM for examining the acceptance of mobile banking adoption in Indian context. The results supported that TAM predicted the adoption of mobile banking adoption. Hence it was a parsimonious and robust model. Also, the results showed that TAM demonstrated a higher predictive power when extended with trust construct.

The table 5.26 showing the communalities of the factors analyzed without trust construct:

Table 5.26 Communalities

Communalities

	Initial	Extraction
Att1	1.000	.691
Att2	1.000	.716
Att3	1.000	.730
BI1	1.000	.568
BI2	1.000	.639
BI3	1.000	.648
PU2	1.000	.570
PU4	1.000	.452
PEOU3	1.000	.522
PEOU5	1.000	.584

Extraction Method: Principal

Component Analysis.

Hence the results of the present research supported that the extended technology acceptance model is apt model that determined the adoption of technology by extending with trust construct with great significance. The study supported that extended TAM remained a highly parsimonious model as compared to other adoption models. It was also proved that TAM is valid and a robust model [185] and can be successively applied across diverse set-ups [160] as shown in the table 5.27.

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	5.056	50.565	50.565	5.056	50.565	50.565	3.876	38.765	38.765
2	1.064	10.643	61.208	1.064	10.643	61.208	2.244	22.443	**61.208**
3	.848	8.482	69.690						
4	.741	7.409	77.099						
5	.569	5.686	82.786						
6	.520	5.205	87.991						
7	.398	3.983	91.974						
8	.301	3.011	94.985						
9	.259	2.590	97.575						
10	.242	2.425	100.000						

Extraction Method: Principal Component Analysis.

Table 5.27: Total Variance Explained

The extended TAM model explained 77.18 percent of the variance in intention as compared to 61.208 per cent in original TAM model. So, it can be concluded that extended TAM showed a better predictive power. Hence the study contributed by analyzing the enhanced applicability of TAM in the Indian context.

On basis of empirical study on 793 users in India, it was concluded that the variance of behavioral intention was highly explained by the extended TAM. As discussed, the current TAM model explained 77.18 percent of the variance in intention. Hence, this work contributed by indicating the potential validity and generalizability of TAM in the context of mobile banking adoption among Indian youth.

5.9 **Conclusion**

This chapter has discussed the results of research study. The statistical procedures incorporated in the study for analysis were discussed. The outliers were examined using SPSS V19. For univariate outliers, the values were drawn from Z scores. For multivariate outliers, the mahalanobis distance was identified.

To test normality, the research employed the values of skewness and kurtosis. The observed values of skewness and kurtosis ascertained that the data were normally distributed. SPSS V.19 was used in the analysis. The reliability and validity tests including content validity, discriminant validity and convergent validity were assessed before proceeding to the path analysis. The path analysis was performed to assess the magnitude and direction of relationship between the constructs.

Finally, discussions on the results obtained were conducted and relevant justifications were provided.

Chapter 6

Discussions, Implications and Future Scope

6.0 Chapter Introduction:

In this chapter the results reported in the chapter 5 are discussed. The comparative analysis with the previous studies on the similarity and deviations have been done based on the review of the literature, theory, assumptions and findings. Where some previous studies supported the results, some contradicted the study findings. The first section of the chapter includes the discussion on the overall findings of the research study. The later part of the chapter focusses on the implications, conclusion and recommendations for future study

6.1 Results and Discussion

The main objective of this segment was to report the results of the analysis and discuss the study findings. The analysis was conducted in synchronization with the study objectives. The objectives of the study were as following:

- To investigate the adoption of mobile banking in the Indian context.
- To ascertain the demographic factors that influences the decision to use mobile banking in Indian Youth
- To evaluate whether the TAM model provides a solid theoretical basis for examining the adoption of mobile banking in the Indian context.

6.2 Objective 1 Summary:

Explaining Intention towards Mobile Banking Adoption:

The primary objective of this research was to examine the adoption of mobile banking adoption by applying the TAM model. This study extended TAM model with Trust with consideration to the facets of mobile banking environment in Indian context.

On basis of the study conducted, table 5.18 summarizes the results obtained.

	Estimate			Regression Wts	P	Result
HIA	PU	<---	TRUST	0.092	0.227	Not Supported
HIB	PEOU	<---	TRUST	0.619	***	Supported
H2	Attitude	<---	PU	0.865	0.027	Supported
H3	Attitude	<---	PEOU	-0.105	0.722	Not Supported
H4	PU	<---	PEOU	0.654	***	Supported
H5	BI	<---	PU	0.353	***	Supported
H6	Attitude	<---	TRUST	0.122	0.043	Supported
H7	BI	<---	Attitude	0.547	***	Supported
H8	BI	<---	TRUST	0.038	0.411	Not Supported

Table 5.18: Path Analysis Results from chapter 5

The results showed that the intention to use mobile banking is determined by Attitude (β=0.547, p<.01) and Perceived Usefulness (β=0.353, p<.01). Attitude is predicted by Perceived Usefulness (β=0.865, p<.05) and TRUST (β=0.122, p<.05). Perceived Usefulness is predicted by Perceived ease of use (β=0.654, p<.01). Perceived ease of use is predicted by TRUST (β=0.619, p<.05). Trust has positive effect on Attitude TRUST (β=0.122, p<.05) and Perceived ease of use (β=0.619, p<.05). As both attitude and intention are found to have significant influence of IT (Davis [146], Ajzen and Fishbein [151], Venkatesh et al., [437]). The mobile banking adoption in this research is evaluated not only by intention to adopt but also by assessing the attitude towards adopting mobile banking.

Therefore, the hypotheses so formulated included influence of the independent factors on attitude as well as behavioral intention. Demographic factors were also evaluated to identify their role in adoption.

6.2.1 Explaining Intention towards Mobile Banking Adoption

The intention to use mobile banking adoption was jointly predicted by Attitude (β=0.547, p<.01) and Perceived Usefulness (β=0.353, p<.01). Attitude (β=0.547) has significant influenced on intention hence supporting the hypothesis H7. The result showed consistency with the previous

studies [450, 451, 452, 453]. As attitude plays a crucial role in influencing intention, therefore a strong positive attitude would lead to positive intention of individuals towards adoption of mobile banking. Hence attitude is the vital determinant of intention for adoption of technology [172, 146]. The results were consistent with the previous findings by Taylor and Todd [128] and Davis [146]. The relationship between Perceived Usefulness and Intention was found to be significant (β=0.353) thus supporting hypothesis H5. The results show consistency with findings by Taylor and Todd [128]. The relationship between Trust and Intention was not found to be significant (β=0.038) hence hypothesis H8 was not supported. The findings are inconsistent with previous study by Suh and Han [209].

6.2.2 Explaining Attitude

The Attitude towards mobile banking adoption was predicted by Perceived Usefulness (β=0.865, p<.05) and Trust (β=0.122, p<.05). The path between by Perceived Usefulness and Attitude was found significant (β=0.865) thereby supporting hypothesis H2. The results were consistent with Taylor and Todd [128], Thakur [455], Koenig-Lewis et al. [95], Wessels and Drennan [456] and Hanafizadeh et al. [133]. In fact, Perceived Usefulness was found to have the highest impact on Attitude signifying the importance of role of perceived usefulness in formulation of his attitude towards the adoption. The relationship between Trust and Attitude was found to be significant (β=0.122) hence supporting hypothesis H6. The findings supported the study by Gefen et al [454]. The findings were inconsistent with previous study by Wu and Chen [196] that established there is strong influence of trust on the attitude.

6.2.3 Explaining Perceived Usefulness

The Perceived Usefulness of mobile banking adoption was predicted by Perceived ease of use (β=0.654, p<.01). The hypothesis was supported as the result was significant and consistent with the studies by Davis [146], Taylor and Todd [128], Thakur [455], Dabholkar and Bagozzi [171], Venkatesh et al. [138], Gefen et al [207], Wessels and Drennan [456], Luarn and Lin [107], Hanafizadeh et al. [133] and Taylor and Todd[128]. The result signified that Peou had a positive and significant impact on perceived usefulness. Hence it meant that mobile banking was a user-friendly technology and needed simple elementary skills for using this technology. As suggested by Davis [146], “technology becomes useful when its usage becomes easy, and

Perceived ease of use determines perceived usefulness". Therefore, it can be inferred that when the technology signifies convenience and simplicity of use it drives is adoption in comparison to the technology deemed complex and difficult to use. Hence, when the technology is effortless and easy to use it will strike the cost to benefit relation by the result-focused individuals [137]. The path between Perceived Usefulness and Attitude was found significant (β=0.654) thereby supporting hypothesis H4. The results were consistent with Taylor and Todd [128] and Gefen et al [454]. The path between Trust and Perceived Usefulness was not found to be significant (β=0.092) hence the hypothesis H1A was not supported. These results were consistent with the findings of Muchran et al. [457]. The results were inconsistent with findings of Wu and Chen [196]. This meant that even if an individual was having a confidence on mobile banking it was not necessary that he will consider it useful.

6.2.4 Explaining Perceived ease of use

Perceived ease of use for mobile banking adoption was predicted by Trust (β=0.619, p<.05). The path between by Perceived ease of use and Trust was found significant (β=0.619) thereby supporting hypothesis H1B.

6.2.5 Trust

As per the present research framework, trust was proposed as an important variable that has significant influence on the adoption of mobile banking adoption. The results substantiated that the trust has significant influence on Perceived ease of use (β=0.619) results were consistent with Wu and Chen [196]and Gefen et al [454] and Attitude towards mobile banking adoption (β=0.122). The impact of Trust on Perceived usefulness (β=0.092) and Intention (β=0.038) was not found to be significant (β=0.619). In summation, Trust showed significant relationship with two determinants of behavioral intention towards mobile banking adoption in TAM. Hence it validated the need to extend the TAM model with trust in the present research to have higher predictive power of the mobile banking adoption model. Moreover, the study supported the inclusion of trust as an external influence that influences the perceived ease of use and attitude towards adoption of mobile banking adoption.

6.3.1 Summary - Impact of demographic factors

The research results indicated the Age and Profession had statically significant influence on the mobile banking determinants. Age was found to influence the perceived ease of use of mobile banking use. The age group with the highest impact was between the age group 22-25 years followed by 31-35 years. Also, the working professional's professional category had statistically significant impact on intention to adopt mobile banking. The Gender had impact on the attitude to adopt mobile banking.

6.3.2 Summary -Evaluation of TAM model Efficacy

The results of the present research have supported that the extended technology acceptance model is apt model that determines the adoption of technology by extending with trust construct with great significance. The study supports that extended TAM remains a highly parsimonious model as compared to other adoption models. It is proved that TAM is valid and a robust model [185]. and can be successively applied across diverse set-ups [160]. On basis of empirical study on 793 users in India, it was concluded that the variance of behavioral intention is highly explained by the extended TAM. As discussed, the current TAM model explained 77.18 percent of the variance in intention. Hence, this work contributes by indicating the potential validity and generalizability of TAM in the context of mobile banking adoption among Indian youth.

6.4 Discussion

The primary objective of this research was to examine the adoption of mobile banking adoption by applying the TAM model. This study extended TAM model with Trust with consideration to the facets of mobile banking environment in Indian context. The research has substantiated that the additional belief construct trust is an important predictor of adoption of mobile banking in Indian context. The research was conducted by drawing a large sample of users of mobile banking to conduct the empirical investigation. The study provides many new revelations with reference to the role of trust and TAM in mobile banking adoption.

6.5 Implications of the Research

A. Managerial Implications of the Research: With development of mobile banking infrastructure incurring enormous investments, resources and time, mobile banking technology has offered multiple functionalities to the users that include reduction in time needed to conduct transactions, providing huge cost efficiencies and endowing

them with benefits of convenience for conducting banking transactions free from temporal and spatial constraints. However, despite loads of efforts underway, the present mobile users yet need to be motivated to embrace mobile banking technology. The results of this research provide significant inferences and suggestions to the practitioners, marketing managers, bank officials, financial service providers and service developers to incorporate valuable suggestions from design to implementation of mobile banking technology to achieve higher levels of adoption in India.

Perceived usefulness and perceived ease of use are essential factors that determine technology adoption. As the relationship between perceived ease of use and usefulness was positive and strong. Therefore, the service providers and financial institutions including banks should bundle it in mobile banking, mobile shopping/payment, m-ticketing in their offerings and promote more similar services such as make it easier to operate. Provide the back-end support available 24X7 through website or specific links, ensure the system a connection robustness by strengthening the internet connectivity and speed. Also, FAQs on general concerns and how to do videos may be of paramount benefit to the new users of mobile banking. The results indicate that perceived usefulness has the greatest influence on attitude. This affirms the significance of this perceived usefulness for adoption of m-banking. It implies that for mobile banking to be accepted by the users, they must be able to recognize its usefulness, that it is fast and would be able to bring ease of conducting transactions as compared with the traditional branch banking system. Perceived usefulness in turn is determined by Perceived ease of use. This signifies that if the individual perceives mobile banking is easy to operate and use, he perceives it minimizes his effort to conduct his banking transactions as compared to the other available modes such as visiting bank branch to conduct transactions. Henceforth it increases his belief about its usability as well. Moreover, India is a developing country that is predominantly a cash carry culture. People often hold strong concerns about privacy and security of transactions that are conducted virtually especially involving money especially the youth segment. The research results signify that though the customers are willing to adopt the technology however high levels of trust needs to be established to evade the fear of risk and security. The present research provides implications to the bank practitioners, financial services providers and corporates. The bank officials who interact with customers that visit bank branch play a pivotal role in influencing their beliefs about perceived usefulness and perceived ease of use and attitude towards adoption of mobile banking services. Since the bank professionals are the primary point of physical contact with the bank customers

who would be the potential mobile banking service users. Hence, they must capitalize on this aspect and plan strategies accordingly to attract, inform and retain the potential and existing mobile banking users. As the best strategy begins at home, the banks are the crucial link that can effectively introduce the bank customers to this technology by vividly educating and informing them about the technology in simplistic manner. In essence the customers need to understand that mobile banking is easy to operate and will enhance his work efficiency. Also, in order to address their security concerns, banks must take appropriate measures like formulating and adhering to clear guidelines related to security and privacy and educating the customers about the same with high prominence. This may establish and enhance their trust in the technology manifold.

With reference to perceived ease of use, the mobile apps and mobile websites must be designed aesthetically that provide the mobile banking services in easy to understand and operate manner. It must be ensured that conducting transaction is made as simple as possible with proper use of design features and app programming that the user is driven towards exploring more of its services and features. As the user finds it easy to operate, it eventually impacts their perceived usefulness [221]. It will also develop a positive attitude towards its use and encourage the users to devote more time exploring and using it [190]. Besides the app design and aesthetics, the speed of access and availability of service 24X7 must be there. Any instance of service failure may trigger a negative experience that may influence user's perception of ease of service use significantly. Hence possibility of occurrence of such events must be avoided. Also, proper support in case of any unavoidable system glitches must be available for customer to minimize any fear or anxiety. This enhances the user's trust on the system that even if failure occurs, he will be appropriately supported and guided.

For perceived usefulness, the providers must drive massive information drive to inform the individuals on the benefits offered by mobile banking in terms of time and cost savings as compared to visiting bank to conduct transactions, standing in queues and spending money such as money spent to reach the bank. Likewise, widespread of information pertaining to the convenience offered by mobile banking to conduct transactions at any hour of the day instead of waiting for the bank opening hours and travelling to and fro to conduct transactions. Perceived usefulness is also believed to be associated with system characteristics, that is the spectrum of services offered by the system and their usability. Hence the promotional campaigns must point

out varied services provided to the mobile banking users. In addition, the services in offering should be enhanced and expanded on continuous basis adding more services to be on offer. Hence to attract, inform and retain the customers, marketers, application developers and financial institutions should prepare proper strategy to ensure promising results and avoid disasters owing to overseeing critical aspects that impact adoption.

a) **Inform:** As mobile banking is still in its nascent stage, creating awareness about its use and functionalities would be the key to its success. Extreme endeavors must be undertaken by the banks and the mobile app and mobile website developer to create awareness on its ease of use, usefulness and heighten the intensity of trust between the customer, the bank and the mobile app/website provider [458]. As substantiated by the current research results, since trust determines ease of use and attitude perception towards adoption, the awareness may be spearheaded from banks by capitalizing on the relationship and confidence people entrust on the bank employees for their financial operations, such as bank tellers, bank assistants. Since customers interact mostly with the bank officials to conduct their transactions, hence they develop relationship and generate a point of trust with them. Different strategies should be applied by banks to increase the level of trust between banks 'website and customers [458].

Hence the bank officials would be the most influential medium to establish the positive beliefs and attitude for use of this new innovation and its adoption. These bank officials can detail the use process methodically to the potential users such that it is rendered simple, easy and useful. A proper training to these employees may inculcate a standardization and effectiveness in the information dissipation process.

If individual believes that the provider is investing time and effort to provide service that will reduce their mental effort and make their life easier, they trust it. If they trust it, they develop a belief that it is easy and simple to use that influences their attitude and intention towards adoption.

Building a well-designed app or website is also essential to ease the customer into using mobile banking without undergoing a drastic change in their use behavior. The mobile app/website should contain essential guidelines and instructions for conducting the transactions swiftly and provide necessary assistance in instance of need. Websites can also be pivotal in drawing customer feedback and grievances that may enhance the probability of reaching out and knowing the new as well existing customers to serve them well. Also conducting research and surveys at

regular intervals to understand the changing needs and demands of the customers as well as to understand the changing landscape may also serve as an important strategy for success.

Using such media augments the understanding and positioning of the technology in the individual's mind. If they have positive attitude towards the technology and trust it, if they perceive that their feedback and suggestions are taken seriously and recommendations are acted upon, they develop trust in the provider. The awareness may also be incorporated through external channels such as using media. The advertisements on broadcast channels such as TV, radio may reach out millions and can speak of the technology emphatically and its benefits to the individuals. Print media through brochures, handouts that illuminate on the aspects of "cost effectiveness", "time efficiency", "value" offered to the customers can be incorporated regarding mobile banking use. Besides instructions and functionality details such media channels can also act as a medium to inform customers on the providers stringent policies and procedures that promise security and safety of their transactions. Such claims build the landscape for instituting trust in the minds of customers that influences their beliefs towards development of a positive attitude for mobile banking adoption.

As trust influences the attitude towards adoption significantly, the provider must ensure that the entire system is robust and not prone to system failures and breaches. Their whole infrastructure, ecosystem of suppliers and parties into offering this service must be security and integrity compliant. This may also include cooperation and support from government and other regulatory bodies. The security of the transactions and its reliability are key to sustainable service. Also, the broadband must be free from speed and failure errors. Having clear stated policies on security and integrity also helps the individuals in engendering their confidence and faith on the provider. Such policies must be included in all information documents and stated in clear simple non-technical language that can be easily understood by the individuals. Trust is critical to overcome the fear and uncertainty. In addition, offering guarantees and compensations in case of system hack or fraud engenders a strong communication of goodwill for company and trust in users. Moreover, giving training the mobile banking users to generate, maintain and change their personal information to reduce possibility of fraud [459]

b) **Attract:** In order to attract the customers towards new innovation, the information regarding its benefits and advantages should be given to the customers. Also, the functions and

features of the innovations should be well understood by the prospective users. So, they need to be suitably informed and be provided with necessary information. Aggressive promotions especially covering people from semi-urban and rural regions to befriend them with service and technology clarity must be done . If people have awareness about this technology, they can be in a better situation to discuss its pros and cons and be willing to participate in any drives initiated by the providers.

Perceived ease of use and perceived usefulness are the primary function of adoption. Hence, intensive measures must be taken to educate the people on using this technology along with creating awareness about it. As education about technology makes it appear simpler, free of complication and easy to operate. As the perception of perceived ease of use increases among people, they tend to develop a positive belief of perceived usefulness which influences the attitude towards technology and its adoption. As perceived ease of use has strong influence on perceived usefulness, so if the customers are attracted towards mobile banking adoption by informing about its simplicity and easiness that can influence their beliefs about its usability in their banking operations.

There can be training courses for using mobile commerce applications, media supplements and bank official assistance that educate customers on mobile banking use and applications. Even though such training courses may not be directly about e-banking but it does help individuals form a positive attitude, perceived ease of use and perceived usefulness towards adoption of m-banking services [107]. Moreover, such courses also form favorable perceptions of perceived usefulness, ease of use and attitude which may influence the intention for adoption of m-banking [107]. Moreover, this will lead to a hassle-free use and better retention of the customers eventually.

c) **Retain:** The present research findings propose following for the bank practitioners, financial service providers and web developers who wish retention and expansion of their customer base with regards to mobile banking. The individual respondents displayed primary inclination towards mobile banking usefulness since this construct showed the most significant impact on the attitude towards intention. The results signify that during marketing of their offerings, the banks must emphasize on the array of advantages and benefits the user can get from mobile banking and the huge impact this technology can bring in terms of providing convenience,

incurring less cost and less time and accessibility to the information in detail on click of a mouse [460].

The technology service that is effective, efficient and secure leads to a satisfied customer who creates a positive word of mouth and positions the provider as precise, uncomplicated, reliable and trustable service provider. Banks should use their brand power to instill promise of safety and security in minds of individuals since if there is trust for the provider than there would be trust for the product. The providers must offer clear statements about its security and privacy policy to establish its integrity.

This besides enhancing the customer retention also leads to acquiring new customers. In addition, the existing users may be employed as messengers of good-will by offering them discounts and benefits for sharing their experiences and success stories of using mobile banking and its implications on personal and professional networks.

Also, the bank and financial providers must be proactive in improvement and enhancement of the services. Strict Information Technology (IT) and cyber-crime laws must be constituted seeking cooperation from government and regulatory bodies to instill the customer trust by eliminating the fear of risk and failure and retain the customer base. Hence the value proposition of the service must be enhanced by seeking collaborative efforts from the customers, government and regulatory bodies. As based on the study results, trust influences perceived ease of use and attitude, hence more the confidence a customer places on the provider higher would be his positive attitude or adoption and is perception of regarding the technology as a simple and easy to use.

Since perceived usefulness is influenced by perceived ease of use and no influence by trust, that signifies that if the individual perceived technology increases his work efficiency and is easy to use, he develops a positive influence on the attitude towards its adoption. The perceived use may differ from individual to individual based on their need for using the service. Hence it is important for the bank and financial service providers to identify and understand the customer segments to outline their beliefs of usability from the technology. The provider has to clearly understand the needs and requirements of the customers to be able to offer them the services they expect and be able to provide them a unique customized value proposition. Hence a systematic analysis of the potential and historical data analysis of existing customers is pertinent to understanding and

categorizing the individuals suitably to persuade them to use mobile banking and serve them better. This would allow the providers to deploy proper targeting strategy to offer right service to the right user. The findings of this research display the necessity to targeting specific segments of the given population as there are higher chances of success. Hence the providers including banks, web app developers and financial service providers must create and run the awareness, training and marketing campaigns. As the findings of the study reveal that if training courses, awareness and marketing campaigns are targeted towards youth in the age group 22-25 year, the influence on the ease of use would be most significant as people belonging to younger age group consider that perceive ease of use significantly influences their adoption of mobile banking.

Since this group of users are mostly studying and have limited availability of funds at their disposal hence are sensitive towards cos. As expenses form as major decision criteria, so the cost effectiveness and convenience can make a big impact on their banking decisions such as payment for the fees, recharges, broadband, m-shopping, m-ticketing, m-gaming etc.

Working professionals, on the other hand, are more mindful towards usability of the technology and the convenience it offers. So, the working professionals should be targeted by creating suitable strategies such as organizing seminars, conferences, influence their behavioral intention about technology usability and the benefits which could have strong influence on the adoption of the mobile banking. Such segregated approach may allow the providers to understand need of different segments and harness the technology effectively to serve them better. M-banking is especially valuable for individuals who are frequent travelers or are bound with full day engagement at work, career or family and hence have constraints in visiting banks to conduct transactions. The travelling individuals can benefit from this ubiquitous access of banking services without time and place limitations. Similarly, youth who are studying or engaged in career development efforts may prefer using their limited time in rather wise manner. Even though they have monetary limitations and dependencies however they are pro and skillful in using new technologies. This is also the segment that is fervor and fast in spreading their experiences to their friend and family network in positive manner if they are happy and contented.

Hence the practitioners must deploy appropriate strategy for each distinctive segment to enable fast and high proliferation of mobile banking technology.

B. Theoretical Contributions of the study:

The results of the present research supported that the technology acceptance model is a strong determinant of acceptance of technology and is highly parsimonious model in comparison with other adoption models. On basis of survey result of usable 793 responses of Indian respondents, it is proved that the variance in behavioral intention can be significantly explained by the extended TAM. As discussed, the current TAM model explained 77.18 per cent variance in intention. Therefore, the contribution of the current study shows that extended TAM supports its validity and generalizability in the Indian context. By adding the "trust" construct, the study observed that extended model can predict human intention to adopt mobile banking. The present research effectively extended TAM to study mobile banking adoption by including trust and making significant contribution for IS (Information System)/IT adoption across diverse fields. The results indicate that the TAM is a useful model and can be aptly applied to understand mobile banking adoption, however it is limited for the necessity of extending it to predict acceptance of technology by the current study respondents. These results are in consistency with Plouffe, Hulland and Vandenbosch [461] with reference to acceptance of new technology. The extension of TAM model hence gives a clear understanding about the factors that impact adoption of mobile banking in India. Moreover, the results make significant contribution towards the prevailing literature on mobile banking. M-banking is a powerful technology having huge potential in future to make banking easier, effortless and less cumbersome. However, with low levels of adoption, the present study contributes to the existing literature on mobile banking to extend the horizon of knowledge about the factors that explain the adoption effectively. The most significant theoretical contribution of this research is integrating trust for explaining the intention of user towards m-banking adoption. It was found that trust has significant impact on intention for adoption. Hence while examining the adoption, the attention should not only be placed on technology factors but considerable focus must be given on the behavioral aspects as well. The research provides a framework to understand the factors that influence the mobile banking adoption and to apply a new technology across the banks and other financial providers in India which is mobile banking. The research substantiates the extended research model with empirical results and extensive literature review. The proposed research framework is potent model to be applied across the geography for generalization of its results. The research provides good results with high predictive power that can be used in future to understand further technology (IS/IT) adoption.

6.6 Summary

The study was conducted to understand adoption of mobile banking technology. The research model was tested on 793 Indian mobile banking users. Using structured equation modelling it was found that two factors influenced the behavior intention of users which were perceived usefulness and attitude which in turn were influenced by trust, perceived ease of use among the Indian youth. This research intended to address three objectives. The first objective was to identify the determinants of adoption of mobile banking. So, it identified the factors that influence its adoption and theoretical framework was formulated for testing and analyzing. The theoretical framework constituted consisted of perceived usefulness, perceived ease of use, trust, attitude and behavioral intention. All the factors showed certain amount of significant impact on mobile banking adoption. From the framework that consisted of 5 variables, the results showed that perceived usefulness emerged as most significant factor influencing attitude towards intention. Perceived usefulness and trust were the significant predictors of the attitude for mobile banking adoption. Attitude and perceived usefulness were major predictors of intention. This study established existence of relationship between perceived ease of use and trust because the belief that an innovative technology, mobile banking is credible and can be trusted for the individual's need develops the perception of its helpfulness and ease to use. The results signified that perceived attitude had significant impact on user's behavioral intention for adoption of mobile banking along with perceived usefulness construct. The study demonstrated that, for users of mobile banking, who perceive the technology easy to operate possess higher level of perceptions of its usefulness. Out of TAM construct, trust was third most significant factor influencing perceived ease of use and attitude towards adoption of mobile banking. Therefore, the extended model was successful explaining the adoption model in Indian context. This research study is valid, useful and other investigator can use it and mobile banking service providers in India could enhance the adoption rate of mobile banking in India.

6.7 Limitations and Future Scope

The study involved only the users of the mobile banking services. Further research may also study the behavior and beliefs of the non-users towards adoption. The study considered understanding the factors influencing the adoption of mobile banking. The adoption is a phenomenon that can be further explored beyond the given factors and the context. As mobile banking is yet in its nascent

stage in India, so the actual use behavior of the technology users cannot be examined. As the present research understood the impact of trust on adoption, further research may be conducted to study the dimensions of trust on the adoption of IS/IT technology in virtual online mode in developing country. For instance, Gefen [143] studied influence of familiarity and disposition to trust on trust. Grazioli and Jarvenpa [204] established that presence trust predicts the different trust levels of users in online shopping mall. Metzger [462] studied the effect of website, vendors and user features on trust on website. Another limitation of the study may be the variables considered for the user adoption. Researches on TAM has observed that perceived usefulness and perceived ease of use are not only determinants of adoption. Study by Legris et al. [163] concluded that plenty of TAM studies are not the only predictors of technology acceptance. Legris et al. [163] found that many TAM studies lack consistency or clarity and miss out important variables that impact the acceptance of technology. Partially on basis of this regard, extension of TAM model was done by Venkatesh and Davis [184] by adding subjective norms and cognitive factors impact perceived usefulness and perceived ease of use. In this pretext, the present model may also have shortcoming that the important factors such as subjective norms influencing adoption are not included in the model. This makes the way for future research to include other potential factors to examine their impact on the adoption. The research work considered only Indian users as respondents. The behavior of users may vary with different geographic locations therefore further studies in other regions should give deeper insights in application of the proposed model. The research work was targeted on the youth segment only, but, the beliefs and preferences of other segments were ignored. Hence, future study should be done to analyze the factors that act as barrier for the non-users in adoption of the mobile banking. In addition, the research should include the impact of culture as different variables exhibit a divergent influence on diverse cultures. As stated by Bagozzi [463] the respondents at all the times may not be able to comprehend their exact intentions, that could be because of money constraints, time limitations or personal boundaries. So longitudinal research in future may assist in testing the research model, especially the degree to which the individual's attitude leads to intention to adopt mobile banking. Finally, the present research is focused on the study of factors influencing the individual voluntary adoption before demonetization rather than the mandated adoption by government by demonization. So, the Impact of demonetization on adoption in the banking in 2017 was considered as a limitation.

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Appendices-I

Discussion Items for Focus Group

1. What is your level of awareness regarding the mobile banking service provided by Indian providers, what is your opinion about these services?
2. Are you currently using a similar electronic banking, what is your opinion about it in comparison with mobile banking and which one is your preferred service out of them?
3. As compared with the mode of banking you presently use, what according to you are the potential advantages and limitations of mobile banking?
4. Why popularity of mobile banking is so low? What would you suggest and/or recommend for its improvement?

Appendices-II

Discussion Items for Interview

Interview with the Respondents (Mobile Banking Users)

1. What do you feel with the mention of mobile banking?
2. What was your experience on using mobile banking technology?
3. For what purposes you use mobile banking the most?
4. What is one thing you would like to change in mobile banking technology?

Interview with the Bank Managers

1. Which technology-based services are offered to bank customers?
2. Why did you start this new service system?
3. Which difficulties did you experience (customer specific) in getting started?
4. Which were the major technological difficulties (regarding customers) encountered?
5. What kind of issues customer face in using m-banking
6. How are customers motivated to use mobile banking?
7. What do you think are the advantages for customer in using mobile banking?
8. What do you think are the disadvantages for customer in using mobile banking?
9. Which benefits do you think it offers to customer?
10. Has the bank become more profitable since introducing mobile banking (In Operations)?

Appendices-III

Survey Questionnaire

Dear Respondent,

I am a Research Scholar pursuing PhD in the area of management. I request you to kindly provide your valuable responses as they would immensely contribute to my ongoing research, which is pertaining to your adoption and usage of Mobile banking services. I am confident that this research is going to benefit our society significantly especially to the youth who are more adaptive to the new technologies. Therefore, I request you to kindly spare a bit of your valuable time and complete this questionnaire with best possible responses.

I assure you of the privacy and confidentiality your responses.

Mobile banking involves check your account balance, top up /Recharge (Mobile), buy tickets (Travel, Movie), transfer money, pay bills, fees, shopping or doing other related transactions using the Internet. Mobile banking involves using a mobile phone to access your bank via text messaging, bank's web page or via an application downloaded to your mobile phone.

Section A

1. A. Are you aware of mobile banking Yes□ No□

B. Have you done banking using a mobile phone? Yes□ No□

IF YES for (1B)

I. Which is your preferred mode of transaction for banking?

Using PC/Laptop □ Using Mobile □ Both □

II. How often do you transact online with your most preferred bank?

Daily □ Weekly □ Monthly □ Quarterly □ Rarely □

III. How long have you been transacting online?

Less than 1 month□ 1 to 3 months□ 3 to 6 months□ Less than 1 year□ 1 – 3 years□ more than 3 years □

IV. For what purposes(s) you use mobile banking? (Please mark all that apply)

Shopping/ Buying online □ Top up / Recharge (Mobile) □ Immediate Payment Services (Fees) □ Funds transfer □ Balance enquiry/ Mini statement □ Bill Pay (Phone, electricity, Internet, credit cards) □ Buying tickets (Movie, Travel-Air, Train, Bus) □ Any other □ Please specify _____

IF NO for (1B)

I. What are the main reasons/concerns you do not use mobile banking? *(Please mark all that apply)*

Not Aware □ Security issues □ No need to use □ High cost of Internet access □ Difficult or time consuming□ Don't know how to use□ Other□ Please specify _____

II. Assuming that your concerns about mobile banking were addressed, which of the following activities would you be interested in doing? *(Please mark all that apply)*

Shopping/ Buying online □ Top up / Recharge (Mobile) □ Immediate Payment Services (Fees) □ Balance enquiry/ Mini statement □ Funds transfer □ Bill Pay (Phone, electricity, Internet, credit cards) □ Buying tickets (Movie, Travel-Air, Train, Bus) □ Any other □ Please specify _____

III. Your preferred mode of transaction for online banking would be? *(Please mark all that apply)*

Using PC/Laptop □ Using Mobile □ Both □

IV. How likely you plan to use mobile banking in the next 12 months?

Definitely will use □ Probably will use □ Probably will not use □ Definitely will not use □

2. You are currently having a bank account with_____(Bank name please). (If you have accounts in more than one bank please mention the one with which you most frequently transact.)

Section B

The following set of statements relate to your opinions about your mobile banking experiences with your most preferred bank. Please respond according to your response to Statement 1B in Section A. Please indicate the extent to which you think the mobile banking possess the features described through each statement by ticking one of the seven numbers next to each statement. Please rate the following statements on the scale provided from 1 to 7. 1 indicates strongly disagree and 7 means indicates strongly agree in this section.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Partly Disagree	Indifferent or Neutral	Partly Agree	Agree	Strongly Agree

1.	It is easy to adopt mobile banking to accomplish my banking transactions.	1	2	3	4	5	6	7
2.	Mobile banking is very interactive	1	2	3	4	5	6	7
3.	Learning to use the mobile banking is difficult	1	2	3	4	5	6	7
4.	Purchasing/Transacting through mobile banking is easy	1	2	3	4	5	6	7
5.	Purchasing/Transacting through mobile banking is clear and understandable	1	2	3	4	5	6	7
6.	It is easy for me to perform the actions required to purchase/transact using mobile banking	1	2	3	4	5	6	7
7.	Overall, I believe that mobile banking is easy to use.	1	2	3	4	5	6	7

The following set of statements relate to your opinions about your mobile banking experiences with your most preferred bank. Please respond according to your response to Statement 1B in Section A. Please indicate the extent to which you think the mobile banking possess the features described through each statement by ticking one of the seven numbers next to each statement. Please rate the following statements on the scale provided from 1 to 7.

1 indicates strongly disagree and 7 means indicates strongly agree in this section.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Partly Disagree	Indifferent or Neutral	Partly Agree	Agree	Strongly Agree

1.	Transacting using mobile banking is quicker	1	2	3	4	5	6	7
2.	It's more effective to make purchases/transactions through mobile banking	1	2	3	4	5	6	7
3.	It's useful and easy to purchase/transact through mobile banking	1	2	3	4	5	6	7
4.	Mobile banking increases my possibility to transact more	1	2	3	4	5	6	7
5.	It is easier to access my account information like balance amount, etc. through mobile banking	1	2	3	4	5	6	7
1.	The performances of mobile banking always meet my expectations	1	2	3	4	5	6	7
2.	My bank can be counted on (or trusted) for providing a secure mobile banking	1	2	3	4	5	6	7
3.	My bank provides a reliable mobile banking site	1	2	3	4	5	6	7
1.	Adopting mobile banking is an intelligent choice	1	2	3	4	5	6	7
2.	Adopting mobile banking is a good decision	1	2	3	4	5	6	7
3.	Adopting mobile banking is a positive idea	1	2	3	4	5	6	7
4.	I am very likely to be dependent on mobile banking in future	1	2	3	4	5	6	7
5.	I plan to increase my mobile banking usage in future	1	2	3	4	5	6	7
6.	I believe my interest in mobile banking would increase in future	1	2	3	4	5	6	7

Section C: Personal Details

1. Gender Male □ Female □

2. Age 18-21 □ 22-25 □ 26-30 □ 31-35 □

3. Academic Qualification Completed

   Undergraduate: 10th □ 12th □

   Graduate: BBA □ BA □ B COM □ BSc □ BCA □ BTech □

   Post Graduate MBA □ MA □ M COM □ MSc □ MCA □ MTech □

   Other..... (Please Specify)

4. Current Profession

   Student □ Private Professional □ Homemaker □

   Self-employed / Business □ Government Service □ Other □

   *Please specify*_____

5. Yearly Household/family income (in Rs.) (*Not your personal income*)

   Below 3 lakhs □ 3 lakhs to 5 lakhs □ 5 lakhs to 10 lakhs □ 10 lakhs to 20 lakhs □ above 20 lakhs □

6. Does your bank provide training/help on how to use mobile banking? Yes□ No□

7. If yes than with which medium does it provide training/help for mobile banking?

   In person □ On Bank's Website □ Over the Phone□

Optional Details:

Name: -_____

Email: -_____

Contact Number: -_____

BRIEF PROFILE OF THE RESEARCH SCHOLAR

Monica has experience more than 14 years both in academic teaching and corporate experience. Her qualifications are MBA, MCA, MSc (Comp. Science) and UGC NET in Management. She has published and presented over 20 research papers in national and international journals and conferences. She has won Best paper awards at national and International conferences. Her areas of interest are information system management, quantitative techniques and data analytics. Her paper has consistently been top ten papers in 2015-16 at SSRN.

LIST OF PUBLICATIONS OUT OF THESIS

List of Published Papers

S. No	Title of the paper along with volume, Issue No, year of publication	Name of Journal where published	ISSN No.	Volume & Issue	Year	Pages
1	An Empirical Study on Effect of Experience on Consumer Adoption Intention towards Internet Banking	Pacific Business Review International	ISSN No. 0974-438X	Volume10 Issue 4	2017	31-38
2	Mobile banking adoption for financial inclusion: A review of factors	Management & Change	ISSN No. 09740902	Volume 20 Issue 1 & 2	2016	116 - 135
3	Examining the Impact of Social Media on Internet Banking	Arabian Journal of Business Management Review	ISSN No. 2223-5833	Volume 6 Issue 4	2016	234
4	Understanding the dynamics of Mobile banking Adoption by Youth: Empirical Evidence from India	FIIB business review	ISSN No. 2319-7145	Volume 5 Issue 2	2016	46-56
5	Assessing the Impact of Relationship Quality on Online Adoption	International Journal of Business Information Systems Strategies	ISSN No. 22014152	Volume 5 Issue 1	2016	1-13
6	An Analysis of Antecedents of Mobile Banking adoption In India	International Journal of Management, IT & Engineering	ISSN No. 22490558	Volume 6 Issue 2	2016	37-51
7	Exploring Intention to Adopt Mobile Banking Amongst Indian Youth	Journal of Technology and Management	ISSN No. 0976545X	Volume 5 Issue 2	2014	33-48
8	Exploring adoption intention of Mobile Banking -A Modern Retail Banking	International Conference on Management 2014-Changing face of modern retail	ISBN No. 978-93-83842-39-1	Published in Conferenc e Proceedin	2014	207-220

	Innovation for a Better Customer Experience	Conference proceedings		gs with ISBN		

LIST OF PUBLISHED PAPER IN BOOK AS A CHAPTER

S. No	Title of the paper along with year of publication	Publisher
9	Road towards achieving financial inclusion in India- Case of Eko financial services, ISBN: 9789386349552, 2016	Bloomsbury Publication, New Delhi
10	Understanding the Impact of Demographics on Financial Attitude, ISBN: 978938747429, 2018	Bloomsbury Publication, New Delhi

LIST OF PAPER IN CONFERENCE

S. No	Title of the paper along with year	National/ International	Name of Conference	Institute
11	Examination of mobile banking as a tool for inclusive growth, 2018	International	Mapping Global Changes in Business, Economy, Society & Culture	Pacific University, Udaipur
12	Moderation effect of gender on consumer adoption intention towards mobile banking, 2017	International	Nasmei International Conference	Great Lakes, Chennai
13	Examining the impact of social media on internet banking, 2016	International	GDGU ICON 2016	GD Goenka University, Gurgaon
14	Consumer adoption intention towards online banking in India: the moderating role of experience	International	International conference on Advanced Material Technologies	Dadi Institute of Engineering and Technology
15	Does Social Influence create positive attitude towards technology adoption in India-A case of Mobile banking adoption, 2015	International	Managing in Recovering Markets	MDI, Gurgaon

16	Does trust influence mobile banking adoption: An Empirical evidence from India, 2015	International	Paradigm shift in Management and Technology	YMCA University, Faridabad
17	Assessing the Impact of Relationship Quality on Online Adoption, 2014	International	Sixth International Conference on Excellence in Research and Education	IIM Indore
18	Exploring adoption intention of Mobile Banking -A Modern Retail Banking Innovation for a Better Customer Experience, 2014	International	Changing face of modern retail, The new economic order	GD Goenka University, Gurgaon
19	Exploring Intention to Adopt Mobile Banking Amongst Indian Youth, 2012	International	National conference on Science in media	YMCA University, Faridabad