ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

Factors Affecting Mobile Payment Adoption in Ethiopia: A Consumer Perspective

A Thesis Prepared By

Bezaalem Abebe

February 2019,

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

Factors Affecting Mobile Payment Adoption in Ethiopia: A Consumer Perspective

A Thesis Submitted to the College of Natural and Computational Sciences of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

BEZAALEM ABEBE

ADVISOR: DEREJE TEFERI (PhD)

February 2019,

ADDISABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

Factors Affecting Mobile Payment Adoption in Ethiopia: A Consumer Perspective

A Thesis Submitted to the College of Natural and Computational Sciences of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

APPROVED BY: EXAMINING BOARD

_____	_____	_____
External Examiner	Signature	Date
_____	_____	_____
Internal Examiner	Signature	Date
_____	_____	_____
Chairperson, Department Graduate Committee	Signature	Date
_____	_____	_____
Advisor	Signature	Date

DEDICATION

Dedicated to my beloved ones.

ACKNOWLEDGEMENT

First and foremost, I would like to express my heartfelt thanks to my almighty God, who gave me the strength, determination, endurance and wisdom to bring this thesis to completion and made me who I am today. Oh God, I would be nowhere without you.

Next, I would like to thank my advisor ***Dereje Teferi (PhD)*** *for all his advice towards better improvement of this thesis. This thesis would not have been possible without your guidance, enlightening ideas, comments and suggestions. Thank you very much.*

Let me use this opportunity to express my deepest appreciation to my husband Mule. Thank you for your love, care and patience. You let me finish my study with supporting in any way of everything. My Father, mother and Solomon (bro) who helped and supported me in a way. So, I have no words to express my thanks to you. God bless you more and more throughout your life.

Finally, I would like to express my heartfelt gratitude to all that helped in any way, I really do appreciate what you have done.

ABSTRACT

Though several studies have contributed substantially to the literature on mobile payment adoption, the findings of most of the studies may not be applicable to other countries like Ethiopia, due to differences in cultural, economic and legal environments. Moreover, the existing handful researches conducted on Ethiopia did not analyze the adoption of mobile payments; rather they just focused on the framework. Therefore, this study is particularly intended to examine the factors affecting customers' adoption of mobile payments with a special focus on the customers of Commercial Bank of Ethiopia, Dashen Bank and MBirr. The study fills the gap in literature by scrutinizing different technology adoption models. The general objective of the paper is to *identify the factors that affect mobile payment adoption of consumers in Ethiopia. An attempt is made to assess factors affecting customers' decision to adopt mobile payments. The analysis was based on a questionnaire distributed to consumer mobile payment customers of Commercial Bank of Ethiopia, Dashen Bank and MBirr. Broad categories of nine factors were selected to assess different factors affecting customers' decision to adopt mobile payments: relative advantage, compatibility, perceived ease of use, perceived usefulness, perceived cost, perceived trust, perceived risk, attitude and behavioral intention. These variables were modeled to test their effect on mobile payment adoption. The proposed model was tested using a partial least square with the help of the SmartPLS software version 3.0 as well as SPSS version 23.*

Attitude is modeled as a function of RA, CM, PEU and PU. RA, PEU, PU and CM are found to be positively and significantly affecting customers' attitude to adopt mobile payment. At the same time, behavioral intention is modeled as a function of PC, PT and PR. PT and PR are found to be positively and significantly affecting customers' behavioral intention to adopt mobile payment. On the other hand, PC was found to be positively but insignificantly affecting customers' behavioral intention to adopt mobile payment. Finally mobile payment adoption is modeled as a function of the average values of attitude and behavioral intention. AT and BI are found to be positively and significantly affecting customers' adoption of m-payment.

Key words: mobile payment, relative advantage, compatibility, perceived ease of use, perceived usefulness, perceived cost, perceived trust, perceived risk, attitude, behavioral intention, technology, adoption, model

List of Tables

List of Figures

List of Acronyms

AML	Anti-Money Laundering
AMP	Adoption of Mobile Payment
AT	Attitude
ATM	Automatic Teller's Machine
AVE	Average Variance Extracted
BI	Behavioral Intention
CBE	Commercial Bank of Ethiopia
CM	Compatibility
DB	Dashen Bank
DIT	Diffusion of Innovations Theory
DOI	Diffusion of Innovation
DTPB	Decomposed Theory of Planned Behavior
EMPS	Electronic Mobile Payment System
e-payment	Electronic Payment
GUI	Graphical User Interface
ICT	Information Communication Technology
IT	Information technology
MNO	Mobile Network Operator
M-payments	Mobile Payments
MPSP	Mobile Payment Service Provider
NBE	National Bank of Ethiopia
NFC	Near Field Communication
O2O	Online to Offline
PC	Perceived Cost
PDA	Personal Digital Assistant
PEU/PEOU	Perceived Ease of Use
PIN	Personal Identification Number
PLS	Partial Least Square
POS	Point-of-Sale

PR	Perceived Risk
PT	Perceived Trust
PU	Perceived Usefulness
QR	Quick Response
RA	Relative Advantage
SEM	Structural Equation Modelling
SMS	Short Messaging Services
TAM	Technology of Acceptance Model
TAM2	Extension of Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory Reasoned Action
UB	United Bank
USSD	Unstructured Supplementary Service Data
UTAUT	Unified Theory of Acceptance and Use of Technology
UTAUT2	Unified Theory of Acceptance and Use of Technology 2
VOD	Video on Demand
WAP	Wireless Application

Contents

CHAPTER ONE

INTRODUCTION

The subject matter is briefly introduced in this chapter. Overview of the study, statement of the problem, research question, objectives, significance, scope and organization of the study are discussed.

1.1. Overview

Mobile devices have changed business and everyday life in the field of communication and now possibly the way financial transactions of all types are made. Mobile devices in particular, mobile phones are in wide use and consumers are becoming increasingly familiar with using mobile phones for various purposes. Mobile phones are providing an extraordinary opportunity for expansion of financial activity in developing countries where the number of phone users can exceed the number of those having bank accounts. It is also much less expensive to financial institutions than opening bank branches especially (Nurhussen, 2016; White Paper, 2011).

Mobile payment, also referred to as mobile money, mobile money transfer, and mobile wallet generally refer to payment services operated under financial regulation and performed from or via mobile device (Nurhussen, 2016; Woldemariam, Atnafu, Gronli, & Ghinea, 2011). The exact definition of a mobile payment is sometimes open to interpretation; it is defined as the act of paying for goods or services between two parties with a mobile device (Sherferahu & Gezu, 2016).

According to Carton et al. (2012) and White Paper (2011) mobile payments center on transactions between consumers and merchants that involve direct purchase of goods and services that can be both account-based and point-of-sale (POS). The products and goods that can be achieved with the m-payments methods could be: Electronic content (Applications, e-Books, games, VOD-Video on Demand, music, ringtones, wallpapers, etc.), Hard goods (Concerts tickets, Books, journals, magazines, etc.) and Services access (transportation fare –bus, subway or train, parking meters, cinema access and other services).

Whereas mobile banking (also known as m-banking, SMS banking etc.) is a term used for performing balance checks, account transactions, payment, etc via mobile device such as mobile

phones (Anyasi & Otubu, 2009). Mobile banking offers bank customers another access channel to traditional banking services to a formal bank account. It allows customers to access and manage bank accounts, deposits, withdrawals, viewing of statements, make payments, receive alerts, check balances and other services that the bank provides remotely. The bank is in total control of the service and the mobile phone is merely a channel to access the financial application that is owned by the bank (White Paper, 2012).

Mobile payments can be categorized based on the technology used as either one of two types: proximity or remote. Proximity payment generally refers to contactless payments in which the payment credential is stored in the mobile device and is exchanged over the air, based on Near Field Communication (NFC) technology, with a dedicated and compatible payment terminal. In other words, the mobile device acts as a contactless payment card, thus becoming a new payment form factor. Remote payment covers payments that take place either via a mobile web browser or a resident smartphone application, in which the mobile phone is used as a device to authenticate personal information stored remotely. Remote payment solutions also can be used for transactions such as face-to-face and vending machine transactions (White Paper, 2011).

Another kind of categorization is based on the entity that holds the account of the customer bank-centric and nonbank-centric (Bash et al., 2015; Chaix & Torre, 2011; White Paper, 2012). In the bank-centric, the account of the customer is held by a bank. Issues involving matters such as accountability, transaction monitoring for fraud detection and compliance fall under the appropriate local, national and international banking laws and regulations. When a payment is initiated, the consumer's bank must authorize the transaction. The payment networks used are the traditional ones such as Visa and Master Card and the major differences are at the endpoints of the transaction.

In the nonbank-centric, the account of the customer is held at nonfinancial organizations such as, a third-party payment service or telecommunication. In such a case, important regulatory, security and even profit sharing questions arise. For example, which entity will be responsible for the regulation as well as guarantee of these services the respective national telecommunication authority or the respective national bank?

In developing countries two models of mobile payment have been widely used: operator centric model and collaborative model. In the operator centric model a telephonic operator is the central node of the model to manage the transaction and distributes the property rights to partners (Chaix & Torre, 2015). In 2007, Safaricom launched M-PESA in Kenya; M is for mobile and "PESA" is the Swahili word for cash. Users can make deposits and withdraw money from a network of agents, transfer money to other users and non-users, pay bills, purchase Airtime. The system is based on many certified agents who make money conversion at the demand of users. Each time a user makes a transfer, he pays a fee to the operator, depending on the amount of the transfer. Receiver is not obliged to be registered with M-Pesa. In the other model, collaborative model is combining the skills of mobile operators as well as banks. Orange Money is a mobile payment service available in 10 countries (Cote d'Ivoire, Senegal, Botswana, Madagascar, Mali, Niger, Cameroon, Kenya, Mauritius, and Jordanian) (Flood, West, & Wheadon, 2013). According to the GSM Association (GSMA) there are 163 mobile payments products operating in developing economies today (e.g. M-PESA, WIZZIT, Smart Money, Digicel Mobile Money, MiCash, etc…) which the products have different functionality, with around another 107 planned. Of those, around 90 are operating in Africa, with around 40 in the Asia-Pacific region and 17 systems in the Americas.

Adoption of mobile payment in developed countries financial institutions and established payment networks are likely to continue to play a role, this is likely to be less of a focus on mobile payment. Even though, some countries adopted mobile payment services, Mobile banking App and PayPal adopted in Australia; PayPal, google Wallet and Square Wallet in United States and Osaifu-keitai "Mobile Wallet" in Japan. Some of these product allow consumer to link bank account, credit card or Debit card account to their mobile payment account while other have functionality of near field communication (NFC) or contactless communication (Flood et al., 2013).

Currently in Ethiopia, Netherlands-based BelCash is offering a technology called hello Cash some banks started using these product, while MOSS ICT, mainly owned by an Ireland-based firm, is rolling out M-Birr (Blair, 2015). In addition these two product providers, Commercial Bank of Ethiopia launched CBE-Birr and Dashen Bank launched Amole to give service for

mobile money or mobile payment services. There are also another domestic banks providing m-payment services. However the study focuses on CBE-Birr, Amole and MBirr services.

1.2. Statement of the problem

The development of technology has high impact on the financial status and capability of a country. People need a more convenient and easy way of payment in their day to day life. Currently in Ethiopia there is a poor cashless payment mechanism specially people in rural areas and the young people without bank account have no way of using cashless payment. In 2017 for instance, out of total utility bills paying Ethiopian customers 99 percent paid using cash only, whereas the corresponding figure was only 12 percent in Kenya, 27 percent in Tanzania, and 59 percent in Sub-Saharan Africa on average. At the same time, out of total Ethiopian wage recipients only 0.2 percent received through a mobile phone, compared to 37 percent in Kenya, 24 percent in Tanzania, and 19 percent in Sub-Saharan Africa on average (Demirguc-Kunt, Klapper, Singer, Ansar, & Hess, 2018). This leads traditional way of cash payment is high which is observed that during cash movement from merchant to customer causing the life span of the cash minimal. Due to this NBE is costing more expense of hard currency for printing, shipping, distributing for commercial banks and then collecting when the money is out of use due to worn-out and burning the worn-out of use cash money. However, mobile technology is rapidly changing the way personal financial services are being designed and delivered. The soaring and large mobile phone user base is pushing companies more and more towards mobile strategies. Many service providers and mobile network operators around the world launched mobile payment applications in attempt for ubiquitous access to payment for services and goods. With mobile payment consumers are able to have anywhere and anytime payment for services and goods via mobile devices (Nurhussen, 2016; ÖRS, 2018). Some service providers in Ethiopia are trying and already started to introduce mobile-based payment systems which some banks and microfinance joined to achieve effective customer's service delivery by providing high level of customer service through online delivery channel, besides operating cost minimization and revenue maximization. According to NBE (2018), number of mobile payment subscribers has reached 1.6 million in September 2018 (National Bank of Ethiopia, 2018).

Despite the works done by the financial institutions to make mobile payment accepted nationwide, the use of mobile for financial transaction is not well adopted by the consumers in Ethiopia and it is underused in spite of technology availability. This could be seen from the fact that in 2017 mobile money accounts in percent of total adults of above 15 years old was just 0.3 percent in Ethiopia compared to 73 percent in Kenya, 31 percent in Rwanda or 21 percent Sub-Saharan Africa average (Demirguc-Kunt et al., 2018). Some studies such as Sherferahu & Gezu (2016) and Woldemariam et al. (2011) have conducted on opportunities and challenges; and also set up framework in Ethiopian context (Nurhussen, 2016). Several research are also conducted in different countries on factors affecting mobile payment adoption to improve better usage of mobile payment and user acceptance (Maradung, 2013; Pidugu, 2015; Tsemane, 2015). Theory and empirical evidence suggest that relative advantage, compatibility, perceived ease of use, perceived usefulness, perceived trust, perceived cost, perceived risk, attitude and behavioral intentions are key factors behind successful adoption of mobile payments (IFSF, 2014; Rogers, 1995).

This study focuses on investigating the factors that are hindering adoption of the technology in Ethiopia. This issue is important because the result of the study holds the clue that will help the banking industry in Ethiopia, particularly for the existing service providers to formulate their marketing strategies to promote new forms and add additional features to mobile payment services in the future. This study therefore aims at filling the gap by investigating factors which encourage and hinder consumers' to the decision for the adoption of mobile payment in Ethiopia.

1.3. Research Question

Based on the above statement of the problem, the following research question is formulated:

What are the factors affecting customers' usage of mobile payment in Ethiopia?

1.4. Objectives

1.4.1. General objective

The main objective of this study is to identify the factors that affect mobile payment adoption of consumers in Ethiopia.

1.4.2. Specific objective

The specific objectives are

1. To analyze the association and factor of relative advantage, compatibility, perceived ease of use and perceived usefulness of m-payment adoption on attitude
2. To analyze the association and factor of perceived cost, trust and risk of m-payment adoption on behavioral intention
3. To analyze the association and factor of attitude and behavioral intention on use of m-payment

1.5. Significance of the study

Mobile payment services enable consumers without bank account use cashless mode of payment, and are cost-effective in rural areas where no financial institutions exist. The study fills an important gap in the literature that is, exploring adoption of mobile payments for potential customers in the Addis Ababa. Therefore, the findings of this study can add to the existing body of the literature and can serve as a springboard for future studies. At the same time, it helps managers of service providers identify the major factors that determine mobile payment adoption decisions among customers. Paying appropriate attention to the findings of the study will be key for the profitability and soundness of mobile payment service providers.

1.6. Scope and Limitation of the study

The main aim of this study is to explore basic factors for the adoption of mobile payment in Ethiopia by using mobile device (mobile phone) as a key element for paying for goods and services. The scope of the study is to evaluate the research question based on the proposed model and provide a solution for a better adoption of mobile payment.

The scope of the research are the following:

- Due to time and cost constraints, this study has focused on customers of Commercial Bank of Ethiopia, Dashen Bank and MBirr customers located in Addis Ababa only.
- This study is limited to identifying factors that affect consumers' adoption of m-payment, not to measure the actual rate of adoption. The adoption factor of mobile banking is beyond the scope of this study.

The limitations of the research are the following:

- There is limited number of previous studies in Ethiopia regarding factors affecting m-payment adoption. Though several studies were conducted on m-payment adoption in other countries, those on Ethiopia are very limited. The socio-economic differences between Ethiopia and these other countries pose some difficulties in adapting to Ethiopia what is done in other countries. This has limited availability of starting point to conduct the research.

1.7. Organization of the Study

The thesis is categorized in six chapters. The first part being introduction, the remainder of the thesis will be organized as follows. The second chapter starts with literature review regarding background of the technology, technology adoption models and related work of internationally conducted research and the m-payment situation in Ethiopia. It also conducts a detail assessment of various technology adoption models and suggests a suitable model for this research. The third chapter describes the hypotheses generated that need to be tested. The key factors likely to affect consumers' decision in the adoption of m-payment in Ethiopia are also presented in this chapter. The fourth chapter provides details of the research methodologies and procedures followed for data collection, analysis and interpretations. The fifth chapter discusses the data collected and its analysis. The sixth chapter, which is the last one, presents the conclusion and forwards recommendations.

CHAPTER TWO

LITRATURE REVIEW

This chapter seeks to review relevant studies and findings that are essential to improve the research and its capacity to analyze the concerns it seek to accomplish, that is, the theoretical and empirical literature. The theoretical literature presents and attempts to explain theories that relate to the subject matter, adoption of mobile payment in Ethiopia consumers perspective. The empirical literature describes what has been practically observed and validated objectively in relation to the subject matter.

2.1. Background of Mobile Payment

Mobile phones have transformed telephony during the past two decades. As devices, mobile phones have for a long time been equipped with functionalities which far exceed the needs of telephony, and have inspired the development of value added mobile services, the use of mobile phones as access devices, and mobile commerce in general (Dahlberg, Mallat, & Ondrus, 2014). Mobile devices have influenced lives of people in ways more than any other innovation in the history of mankind (Thakur & Srivastava, 2014). These developments open very lucrative opportunities to merchants and service providers. There are more mobile phones than any other device that can be used to market, sell, produce or provide products and services (Dahlberg et al., 2014). Mobile devices are the most promising way to reach masses and to create a tie-in among current customers, due to their ability to provide services anytime, anywhere, high rate of penetration and potential to grow. The adoption of mobile devices is significant influence in the financial institutions with mobile banking, internet banking, mobile payment/mobile wallet/mobile money, etc. According to Bearing (2012), more than 5.3 Billion has access to a mobile network via laptop, mobile phone or tablet and about 950 million mobile service subscribers use third-generation services (Bearing Point, 2012).

In late 1990s and early 2000s mobile payment services became a hot topic and remained so even after the burst of the Internet hype (Dahlberg et al., 2014).The world of mobile telephony and secure mobile transactions brings opportunities to transform the manner in which people manage and move money. The past several years witnessed the popularity of mobile commerce

applications, such as mobile shopping, mobile travel service, online to offline (O2O) consumption, etc. The prosperity of mobile commerce heavily relies on the consumer acceptance of mobile payment (m-payment), conducted via mobile terminals, e.g. a mobile phone or personal digital assistant (Yang, Liu, Li, & Yu, 2015).

According to Dahlberg, Mallat, & Ondrus (2014), the commercial history of mobile payment solutions is short but at the same time characterized by rapid development. One of the first commercial mobile payment solutions was a service launched by the Finnish telecom operator Sonera in 1997, in which goods were purchased from vending machines with mobile phones and paid for with mobile operators' service bills together with mobile telephony services. (Dahlberg et al., 2014).

The terminology related to mobile payments is vague and inconsistent. In this research payment is defined as a transaction in which money or funds are transferred from one party (payer) to another party (payee) directly or via an intermediary such as a financial institution. Payments are compensations for purchased physical or digital goods/services or fund transfers between transactions parties (Mallat, 2006). According to Mallat (2006), Payments are carried out with payment instruments, such as coins or debit cards.

2.2. Definition of Mobile Payment

Mobile payments have been the object of study for industry players and researchers for more than a decade and could simply be defined as the use of a mobile phone or PDA (personal digital assistant) to pay for any type of goods (physical or digital) and services from merchants (Gaur & Ondrus, 2012). 'Mobile payments' refers to a variety of financial transactions initiated with a mobile device. This might range from a remittance sent to a person some distance from the sender using only the services of the mobile network operator, to a 'credit card' transaction made at a retail outlet utilizing a contactless chip in the phone (Flood et al., 2013).

According to Wondwossen and Tsegai (2005), mobile payment (m-payment) is an electronic payment done using mobile devices. One of the main uses of m-payment is in mobile commerce (m-commerce). M-commerce is the buying and selling of goods and services through mobile devices. The most important application of mobile Commerce is Mobile payments. These services makes a mobile device to act as a business tool replacing bank, ATM, and credit cards

by letting a user conduct financial transactions with mobile money. A mobile user attempts to purchase goods or services from a business or service provider, which then contacts a trusted third party, the wireless service provider, or a financial institution to authenticate the user and amount of purchase (Raina, 2014). These mobile devices include mobile phones, Personal Digital Assistants (PDAs), smart phones, and laptops (Sherferahu & Gezu, 2016). M-payment carried out over wireless network, SMS, WAP and Bluetooth (Guo & Bouwman, 2016). Mobile payment is started in Japan and today forms a considerable component of Japan's economy. M-payment is also common in South Korea. It is widespread in Europe compared to North America (Wondwossen & Tsegai, 2005).

Other researcher's also defined mobile payment is defined as the use of mobile devices, such as mobile phone, to commit payment transactions. Mobile devices can be used both for proximity and remote payments. Payment transactions have also several other attributes, such as the timeliness, size and credit aspects of payment transactions. The term payment solution is used as a condensed concept, which includes payment method, payment instrument, one or more application areas (use cases) of mobile payments, technologies applied, payment transaction parties and other attributes of payment transactions (Dahlberg, Mallat, & Öörni, 2003).

M-payment is used for online payments and for POS (Point of Sale) transactions. Online payment is used for the purchase of digital goods such as mobile phone entertainment (ring tones wallpaper and so on). In Japan books, music, DVDs, fashion cloth are bought and paid via mobile phones. Mobile devices are also used at POS terminals, vending machines, ticketing machines, etc. The purchase of tickets (such as rail tickets, air tickets, etc) is expected to be a major application area for mobile payment. Banks and other financial institutions are also exploring the use of mobile phones to broaden their business by allowing their customers not only to access account information, e.g. bank balances from anywhere, but also to make transactions via mobile phones (Sherferahu & Gezu, 2016).

Generally, there are three types of m-payments (Wondwossen & Tsegai, 2005). The first is based on the billing system of the network operator. This method lets the user bill their purchase to their monthly carrier bill or deduct it from their pre-paid deposit. M-Pay Bill service from Vodafone and Mobile pay by Sonera are instance for this type of payment (Dahlberg et al., 2003). The second type of m-payment to uses the credit card over a wireless network. The payment

mechanism in this type of payment is all about secure transmission of credit card data to the credit card company. Credit card data is stored securely on the mobile phone. This is done either using a dual slot mobile phone or by employing a dual chip mobile phone. EMPS –Electronic Mobile Payment System by Merita Nordbanken, Nokia and Visais an instance of dual chip alternative. In dual chip mobile phone credit card is stored securely on the mobile phone. In the third type of m-payment account is held at the bank. Transactions such as transferring money between accounts and paying bills can be performed using this type of payment system. Examples are Paybox and MobiPay. The existing banking infrastructure and technology are used for this type of payment. As compared to other e-payment systems, m-payment has got some advantages such as ubiquity, accessibility and convenience (Wondwossen & Tsegai, 2005). In this study mobile payment is defined as any payment effected by using mobile device (mobile phone) using phone number as a key element for paying for goods and services.

2.3. Mobile Payment Ecosystem

A mobile payment service comprises of all technologies that are offered to the user as well as all tasks that the payment service provider(s) perform to commit payment transactions. As Figure 1 shows a mobile payment service may include several parties but the major parties are listed in below. Many issues such as the power and the interests of the parties, legal and regulatory environment, and payment culture impact the orchestration of technologies and tasks into a mobile payment service (Dahlberg et al., 2014).

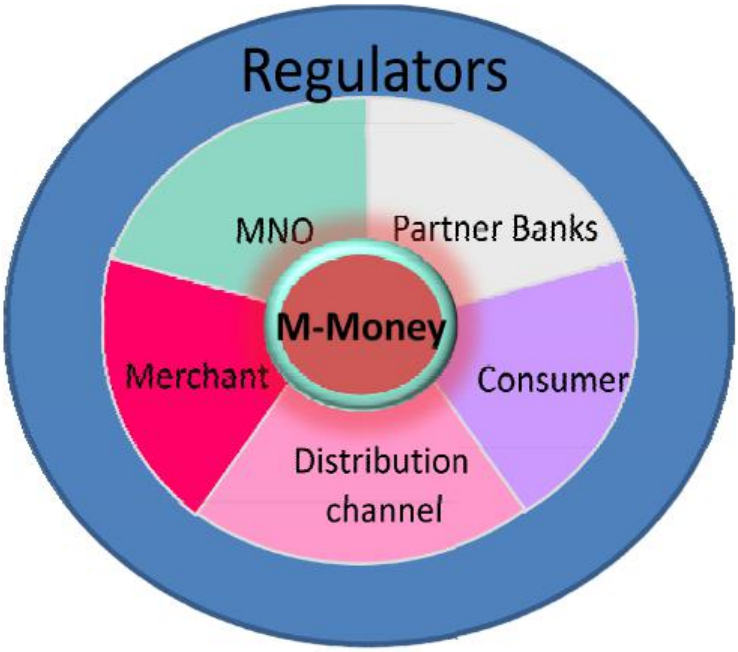

Figure 1: Mobile Money Ecosystem (Tobbin, 2011)

2.3.1. Mobile Network Operator (MNO)

Mobile operators are the stakeholders who ensure a supply of mobile phones with NFC technology and support payment services on their networks for proximity payments (Raina, 2014). In Ethiopia this service has been provided by the state monopoly Ethio Telecom. Nevertheless, there is a government initiative to open the sector to other investors as well. The MNO comes into the mobile with assets and capabilities. First it brings infrastructure, including the wireless communication, backend m-commerce server and application and the mobile device application. Secondly, MNOs bring into the ecosystem their huge existing distribution channel used for the sale of subscription and prepaid credits. These channels are normally far reaching than the branches of the financial institutions. Wherever there is mobile coverage, there is an agent of a distributor who sells the relevant prepaid cards. The MNOs have the capability of attracting the unbanked through branding (Tobbin, 2011).

The ability for MNOs to reach customers across income segments is what gives them the impetus to be a key player in the mobile money ecosystem. Usually the customers in a mobile money ecosystem belong to the mobile network operator. It provides customer services facilities to the consumers and training for the agents in dealing with the customers. Mobile money

provides an attractive preposition for MNO's to achieve a return on the investments made in infrastructure over the last two decades through management of churn, extra payments related revenues and through associated increases in air time and data use. It also reduces the airtime distribution cost as well as meeting service obligations. Mobile money also holds the possibility of allowing for diversification into other areas of the consumer's needs and lifestyle (Tobbin, 2011).

2.3.2. Financial Institutions (Banks)

Payment systems and mechanisms to store value are the primary functions of financial institutions. Financial institutions therefore come into the mobile ecosystem with their vast experience and customer trust in dealing with money. They provide the banking license and store the mobile money customers' deposits in trust accounts. The branch offices of the banks act as aggregation points for the merchants and distribution channels and their agents. In most implementation the banks act as the intermediary between the MNOs and the agents in acquiring the e-value. Where merchants are involved the banks provide a link to the existing merchant account to facilitate the flow of money from its e-float account to its main account. They also provide online banking integration to the m-commerce system of the MNOs to facilitate their operations. They are usually the only institutions mandated to deal with cross border financial transactions (foreign remittances) and settlements. They provide financial regulatory advice to the MNOs and facilitate bulk disbursements and assist with AML and sanction screenings, protect beneficiaries' funds by holding actual cash in a trust account, and provide reports to regulators. Mobile money has the capability of significantly reducing the cost of providing financial services to consumers' what increasing the customer base. It will broaden the spread of the banks and hence help fulfil their service obligations. Mobile money provides a cheaper means to deposit mobilization than the traditional methods used by banks. Additional revenue could be generated form the deposits obtained though mobile money (Tobbin, 2011).

2.3.3. Distribution Channels (Agents)

The distribution channels through their agents act as the primary contact to the customers. These are non-bank entities such as retailers (either the MNOs own retail center or another retailer such as a village store) that handle customer registration and the cash-in/cash-out services on behalf of

the MNO (Tsemane, 2015). They contribute through their knowledge the understanding of the consumers and their needs to further develop the mobile money services. Traditionally, the MNOs were expected to use their distribution channels who resell airline as the main agents of mobile money. However, in most current implementations, the agents have expended to general retailers especially in the rural areas. The agents naturally become branches of the MNOs. The key to choosing an agent line in the retailer's liquidity. They tend to sufficient liquidity from other business activities to satisfy customers' needs to withdraw cash. The agents earn commission on mobile money services rendered. Although these are usually very small amount per transaction, it is expected that the volume of transactions will add up to a good amount. Agents who are existing retailers usually obtain an additional benefit of reducing their risk of carrying huge cash to the bank (Tobbin, 2011). There are super agents and normal agents, whereby the normal agents buy value from the super agents. The super agents buy value from the MNO through the actual deposit of funds at a local bank (Tsemane, 2015).

2.3.4. Merchants and Utilities

Merchants are the stakeholders who accept mobile payments whether contactless or contacted payments (Raina 2014). The merchants and utility providers provide an additional reason to adopt and use the mobile money services. Merchants include, retail shops, online shops, casinos, lottery and general goods and services providers who adopt the mobile money platform as means to receive payments from customers. Customers of the merchant buy e-value from an agent and use it to pay the merchant by transferring the e-value to the merchants account. Also, instead of spending hours in queues to pay utility providers, mobile money affords customers the ability to make payments using the e-value on their mobile phone. This provides convenience, speed and security to the merchant and its customers. The availability of merchants and utility providers increase the customer base of the mobile money ecosystem and thereby acts us a catalyst in promoting the services. Thus, the use of mobile money will reduce the cost of payment collection and processing. It will also increase timeliness of payment an offer greater customer convenience. These can lead to increase customer base for the merchants. Most implementations of mobile money are adopting the Near Field Communication (NFC) technology. This is hoped to boost the customer and merchant experience and foster increased usage of mobile money (Tobbin, 2011).

2.3.5. Regulators

The role of regulations in the mobile money ecosystem is critical for the long term survival of the ecosystem. They bring enormous experience and understanding of the various industries involved in this ecosystem. The work to provide a balance between innovation, value creation, efficiency, financial inclusion and prudence through the imposition of regulations. They enforce compliance to the various regulations. Regulators provide an enabling environment for mobile money, protecting the stability of the financial system and ensuring that regulations are implemented. Furthermore, they play a refereeing role between competing parties. Their activities cover all the other members of the mobile money ecosystem (Tobbin, 2011).

2.3.6. Customers (Consumers)

The customer brings its diverse need as opportunities to the mobile money ecosystem. Customers are the final recipients to a mobile money service. The success of failure of the ecosystem depends on consumer behavior and attitude towards the mobile money services. It is therefore imperative that consumer needs are met by mobile money services and that they have good experience with the services. Mobile money reduces the risk of carrying cash and increase access and affordability of payment, remittance and other financial services (Tobbin, 2011). Consumers register for services, performing 'cash-ins' at agent or merchant outlets to convert physical cash to mobile money before using the mobile funds to perform transactions (Muya, 2016). Consumers are the stakeholders who use the mobile payment devices for conducting mobile payment transaction (Raina, 2014).

2.4. Advantage of Mobile Payment

As an emerging payment method, mobile payment technology is perceived to be a secure and effective substitute of traditional debit/credit card payment. Several reports and scholars claimed that mobile payment technology would become a major future payment method. Compatibility with lifestyle, perceived usefulness, subjective norm and security are the major predictors of consumers' intention to adopt mobile payment technology (Cobanoglu, Yang, Shatskikh, & Agarwal, 2015). The potential benefits to consumers of mobile payments can be evaluated by comparing mobile payment methods to traditional payment methods in terms of key payment attributes. Some attributes, such as convenience, cost, security, and acceptance by merchants,

apply to both mobile payments and traditional payment methods. Others, such as the ability to receive targeted ads and monitor account balances from any location, are especially relevant to mobile payments (Hayashi, 2012).

Mobile payment technologies could bring many benefits to consumers and merchants. Mobile payment systems could act as a digital wallet, storing coupons and loyalty information. Because of the growing storage and computing capacity of mobile phones, they could also become repositories for purchases of goods and services. Mobile payment technologies could help customers keep purchase records, and could address the problem of lost receipts and rejected returns. There is also the potential for better payment security. In most credit card transactions, consumers use the same number over and over again to effectuate charges, without a Personal Identification Number (PIN). Neither consumers nor companies can possibly ensure that the array of individuals who handle credit card numbers keep them securely. Mobile payment technologies could leverage information about the consumer, location information, security features on the device, and one-time account identifiers to more effectively verify buyers' identifies, thereby achieving more secure transactions. Properly implemented, such advances could reduce the harm created by stolen credit card numbers and make it more difficult to engage in in-person credit card fraud (Dennehy & Sammon, 2015; Hoofnagle, Urban, & Li, 2012).

Dennehy and Sammon (2015) identified the following advantages to different stakeholders of mobile payment.

A) Financial Institutions

M-payments offer financial institutions the opportunity to protect the current account and associated loan products and to avoid further disintermediation from the consumer by third parties in the online payment space. M-payments also offer financial institutions the opportunity to reduce the use of cash and its associated costs, as well as the opportunity to service unbanked and underbanked communities in a cost-effective way.

B) Mobile Network Operators

M-payments provide MNOs with the opportunity to recoup the cost and return on investment made in infrastructure through increased air time and data usage by consumers. M-payments also provide MNOs with the opportunity to create new revenue streams by diversifying into new areas of business based on evolving consumer needs and behaviors.

C) Merchants

The benefits of m-payments for the merchant include: higher throughput at the point-of-sale (POS); the ability to send real-time messaging to consumers; and the reduction of service costs through unmanned or remote POS locations. M-payments using NFC technology can also enable merchants to create deeper customer relationship and richer individualized shopping experiences by offering value added services such as digitized loyalty cards and coupons.

D) Consumers

M-payments could allow consumers to make payments 'anytime, anywhere', becoming less dependent on the need to carry cash which in turn could reduce the risk of theft.

E) Regulators

Regulation can provide secure and efficient payments systems to delivery of value to the markets. This in turn can provide governments with the opportunity to enhance financial services, particularly for the unbanked and under-banked populations.

2.5. Mobile Payment Categories

M-payment can be categorized based on different angles like based on technology it use, based on the location for payment, based on service provider, based on settlement originator, based on fund, and so on.

2.5.1. Technology Based Mobile Payment

2.5.1.1. Proximity Mobile Payment

Mobile proximity payments are mobile payments in which the payer and the payee are in the same location and where the communication between their devices takes place through a proximity technology (such as Near Field Communication (NFC), Quick Response (QR) codes, Bluetooth technology, etc.) (De Kerviler, Demoulin, & Zidda, 2016). Mobile contactless payments are part of the mobile proximity payments family. The underlying payment instrument may be a card or credit transfer. Mobile proximity payments encompass payments that are both Customer-to-Business (made, for example, at a merchant store, a car park, on public transport) and Person-to-Person (P. M. Lai, 2010). The payment and settlement processes are the same processes used when the consumer pays with a traditional contactless or magnetic brings the phone to within a few inches of a contactless payment capable POS system and the transaction occurs.

2.5.1.2. Remote Mobile Payment

Remote mobile payment, or m-payment, is when you use your mobile phone to carry out a transaction for a good or service. There are a few different ways that remote m-payment can be carried out. One way allows mobile subscribers to buy something through their phone or via SMS, like an application, ringtone, or video, and it billed to their mobile account. Another way is for mobile phone subscribers to pay directly through a mobile Web site using methods like PayPal, credit or debit cards (P. M. Lai, 2010). According to Raina (2014), remote mobile payments are ideal for use in markets that require person-to-person payments and for under-banked consumers and merchants who are not part of the normal POS acquirer payment process, such as flea market vendors and seasonal outside vendors. (Raina, 2014). A remote mobile payment process is during consumer and merchant set up an account with a trusted third party or MPSP. When a transaction is initiated, a SMS message is sent to the MPSP. Authentication can be secret passwords, validation of handset hardware information, or verification of other sender personal information. After the transaction request is received and authenticated, the MPSP transfers funds from the consumer's account into the merchant's account and notifies the

merchant that the funds have been transferred. In a closed loop system, the merchant may then move the funds into a standard bank account.

2.5.2. Business Model Based Mobile Payment Service

2.5.2.1. Operator- Centric Model

Mobile operator act independently to deploy m-payment application to merchant's NFC enabled on mobile devices (Raina, 2014). The mobile operator loads the NFC mobile and may prepay or operator may add charges to the customer's existing wireless bill (Chaix & Torre, 2011). This model cannot be adopted because of Ethiopia financial rules and regulation does not allow financial transaction to be done other than banks.

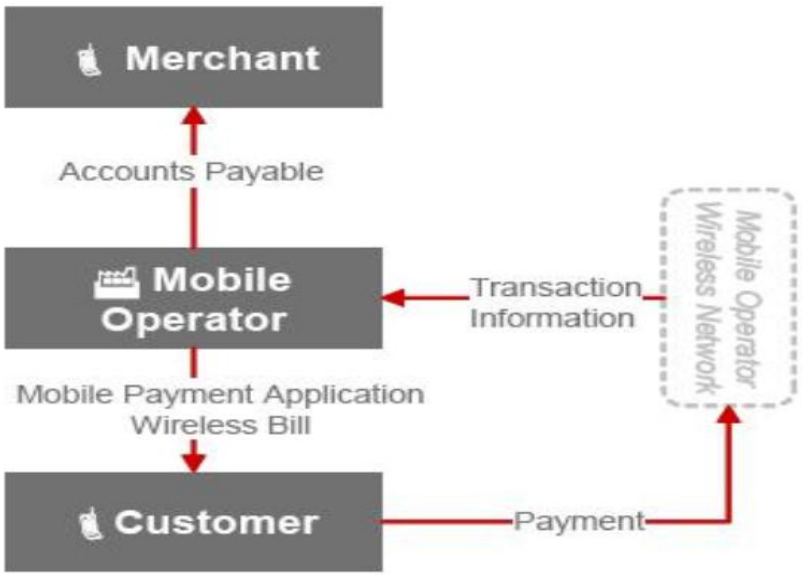

Figure 2: Operator- Centric model (Chaix & Torre, 2011)

2.5.2.2. Bank- Centric Model

In this model, bank deploy m-payment application or devices either by installing POS at the merchants or consumers payment is based on already existing mobile network through their mobile device. It is also considered as an evolution of the credit card model (Chaix & Torre, 2011). According to Chaix & Torre (2011), this adopted the environment of full system of

financial intermediation. Bank is the central node of the model manages the transaction and distributes the property rights.

When a customer wants to make transaction, the transaction will be initiated from the customer‘s phone application provided by the bank. Since it is bank-centric whenever a transaction is made the account of the customer in the bank will be affected (Nurhussen, 2016). Though it is possible to implement it in Ethiopia according to the rule of the regulation of the finance system issued by National Bank of Ethiopia.

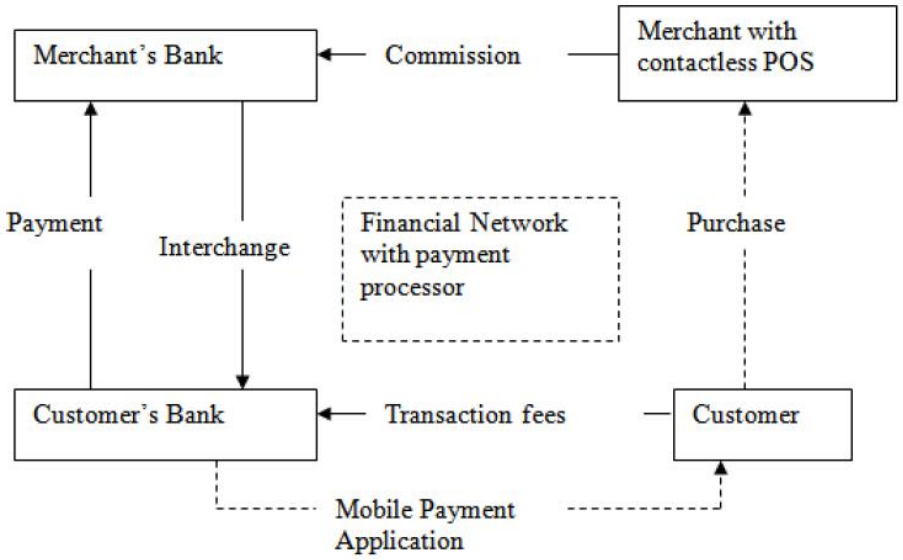

Figure 3: Bank- Centric Model (Chaix & Torre, 2011)

2.5.2.3. Peer-to-peer Model

According to Nebat (2016), P2P the payment is provided by a company which is independent from MNO and financial institution. The third party or also independent service provider manages the distribution of property rights between the operator and the bank internet companies are the ideal candidate (Chaix & Torre, 2011). E.g. Paypal allows customers to send, receive and hold funds. It allows making financial transactions by granting the ability to transfer funds electronically between individuals and business. It can also be made to fit the rule and regulation of our country.

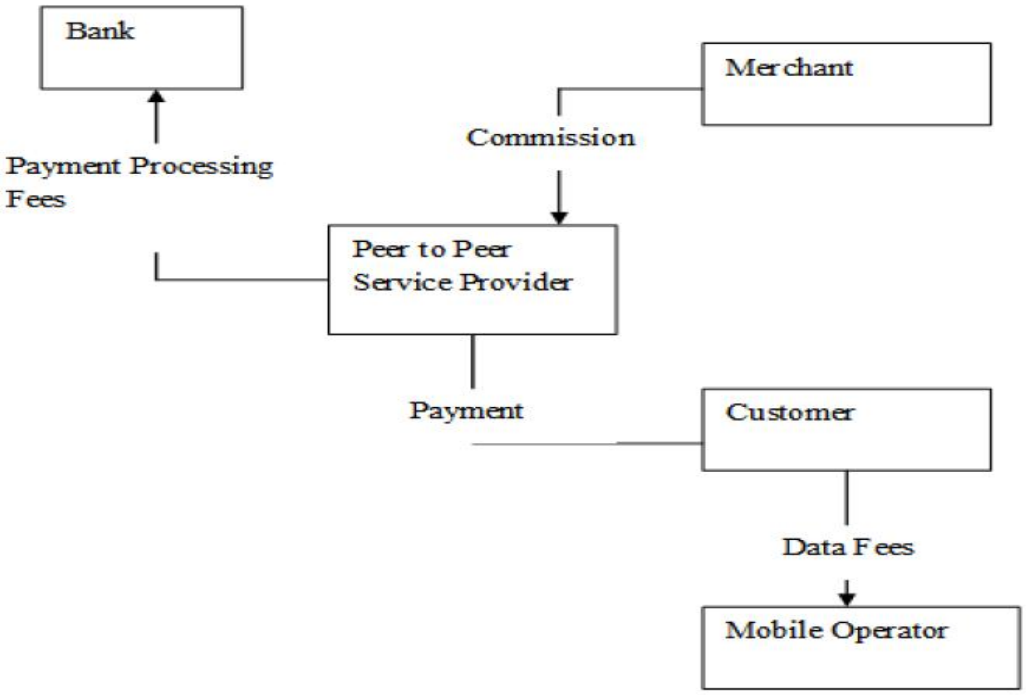

Figure 4: Peer-to-peer model (Chaix & Torre, 2011)

2.5.2.4. Collaboration Model

The collaborative model is financial intermediaries and telephonic operators collaborate in the managing tasks and share cooperatively the proprietary rights. This model involves collaboration among banks, mobile operators and other actors in the mobile payments value chain. This also includes a potential trusted third party that manages the deployment of mobile applications. Payments in this model are processed over the existing financial networks with credits and debits to the appropriate accounts. This model includes two possible scenarios the first is a mobile operator partners with one bank to offer a bank-specific mobile payments service. The second is industry associations representing mobile operators and financial institutions negotiate and set standards for applications that reside on secure elements in mobile devices, allowing multiple card types from different banks to be used. In this model, it is expected merchant fees are split between the banks, mobile operators, and perhaps third-party (Chaix & Torre, 2011; Raina, 2014).

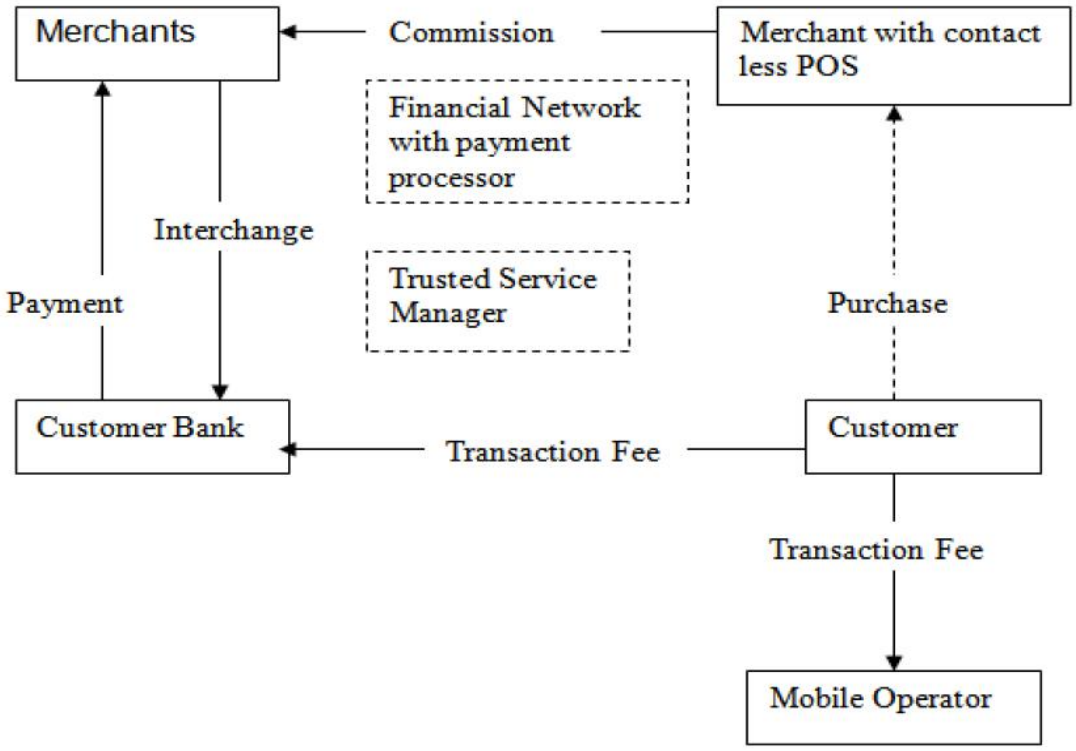

Figure 5: Collaboration Model (Chaix & Torre, 2011)

2.5.3. Role Based Payments

2.5.3.1. Bank-Focused

Bank-Focused model allows the m-payment to be deployed only by a licensed deposit-taking financial institution which delivers banking services to customers using mobile phones as a delivery channel. Participants include initiating banks, its ICT partners and customers. Based on this model, the Lead Initiator shall adhere to put in place adequate measures to mitigate all risks that could arise from the deployment and use its mobile payment solution.

2.5.3.2. Bank-Led

The second, Bank-Led model allows a bank or banks to partner with other organizations to deliver the banking services by leveraging on the mobile banking system. In this model the lead initiator is the bank and participating organizations are restricted to their core competencies.

2.5.3.3. Non-Bank Led

Non-Bank-Led model in which a payment service provider other than a licensed deposit taking financial organization or MNO delivers the mobile payment service to customers (Nurhussen, 2016). This model behave like peer-to peer model of business model based mobile payment in the aspect of the business defined.

2.6. Technology Adoption Models

Technology is changing dynamically to serve consumers need. In this regard how fast consumers are accepting these technologies depends on number of factors. There have been number of researchers addressing consumers' adoption of new technologies (Lai and Zainal, 2015; P. Lai, 2017). Some of them are discussed below.

2.6.1. Theory of Reasoned Action (TRA)

The Theory Reasoned Action (TRA) model has its roots in psychology and it attempts to elaborate and predict the user's behavioral intentions based on 'attitudes' and 'subjective norms' (Fishbein, 1979; Trafimow, 2015).

In this theory, it has been argued that individuals are making systematic use of the information which is available to them. In the original conceptualization of this theory, belief, attitudes, behavioral intentions and behavior were considered as the determinant variables to explain relationships between attitude and behavior. We should also notice that according to the theory of reasoned action, individual behavioral intention is due to two variables (i) attitude toward the behavior and (ii), the social influence perception by individual to perform or not to perform behavior. Attitudes are described as sum of beliefs attributed to a particular behavior. Thus it could vary depending on the attributions and beliefs while subjective norms are described as mostly situational consisting of user's opinion about the subject's behavior which could be influenced by a variety of factors such as economy, politics, society and other demographic variables (Fishbein & Ajzen, 1975). The behavioral intention of a user is described as a user's ability to carry out an intended behavior.

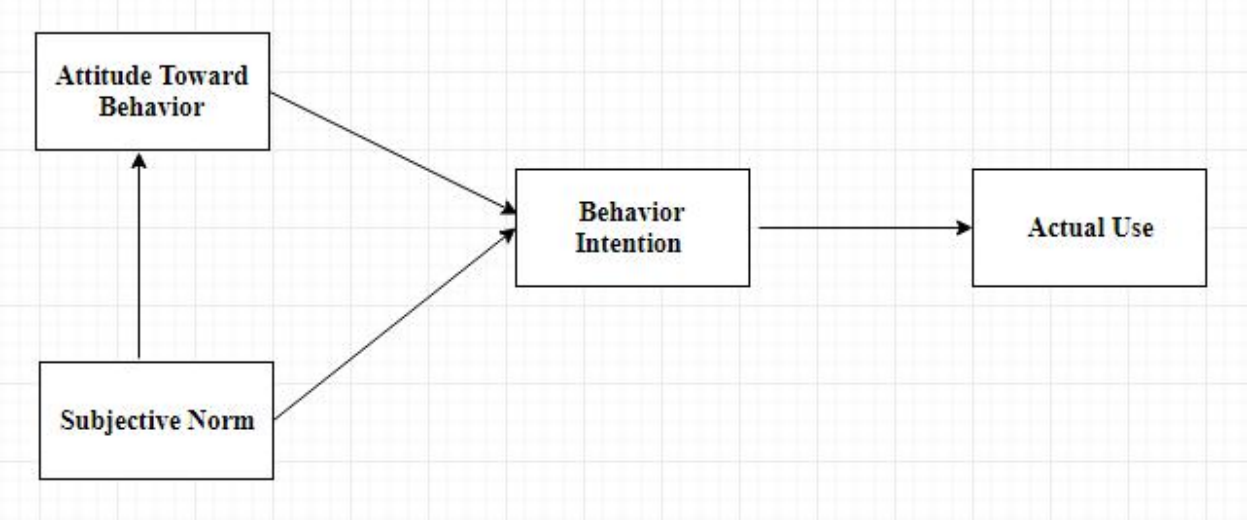

Figure 6: Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975)

2.6.2. Theory of Planned Behavior (TPB)

Ajzen (1985) extended TPB to determine behavioral intention of person's attitude toward behavior. The theory model developed based on TRA with the two factors as same by adding a new factor that is perceived control behavior which refers to the degree to which a person believes that they control any given behavior (Ajzen, 1991; P. Lai, 2017). The TPB increased perceived behavioral control is a mix of two dimensions: self-efficacy is internal factor and controllability is external factor. Self-efficacy refers to the level of difficulty that is required to perform the behavior, or one's belief in their own ability to succeed in performing the behavior (Ajzen, 1991). Controllability refers to the outside factors, and one's belief that they personally have control over the performance of the behavior, or if it is controlled by externally, uncontrollable factors (Ajzen, 1991).

Attitudes refers to "the degree to which a person has a favorable or unfavorable evaluation of the behavior of interest" Ajzen and Fishbein (1980). Behavioral intention is defined as "the motivational factors that influence a given behavior where the stronger the intention to perform the behavior, the more likely the behavior will be performed" Ajzen and Fishbein (1980).

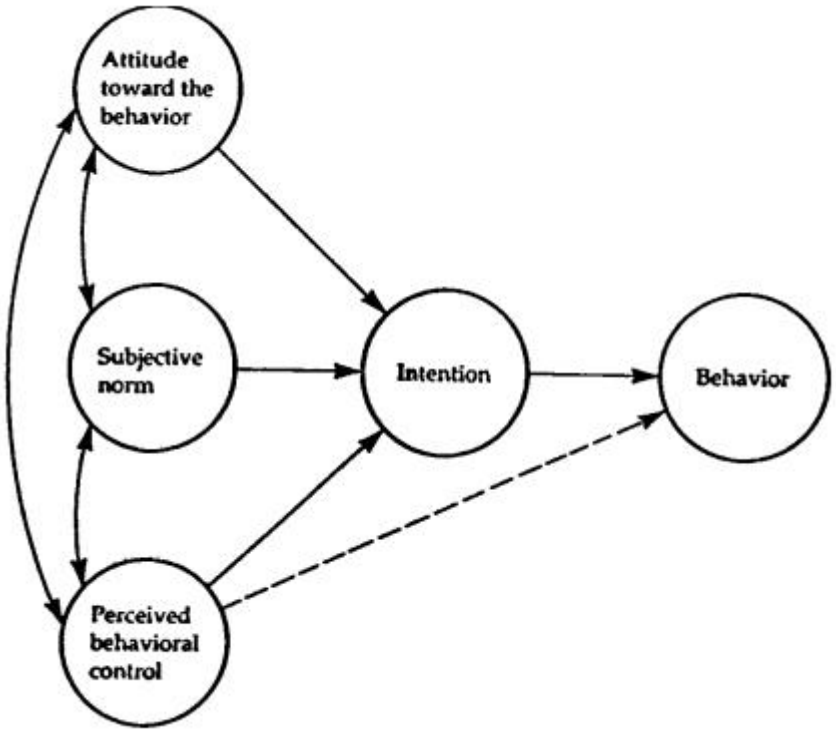

Figure 7: Theory of Planned Behavior (Ajzen, 1991)

2.6.3. Decomposed Theory of Planned Behavior (DTPB)

Taylor and Todd (1995) indicated that better understanding of relationships between the belief structure and antecedents of intention requires decomposition of attitudinal beliefs. They also specified that based on the diffusion of innovation theory, attitudinal belief has relative advantage, complexity and compatibility in order to show that DTPB has better explanatory than pure TPB and TRS model (Shih & Fang, 2004).

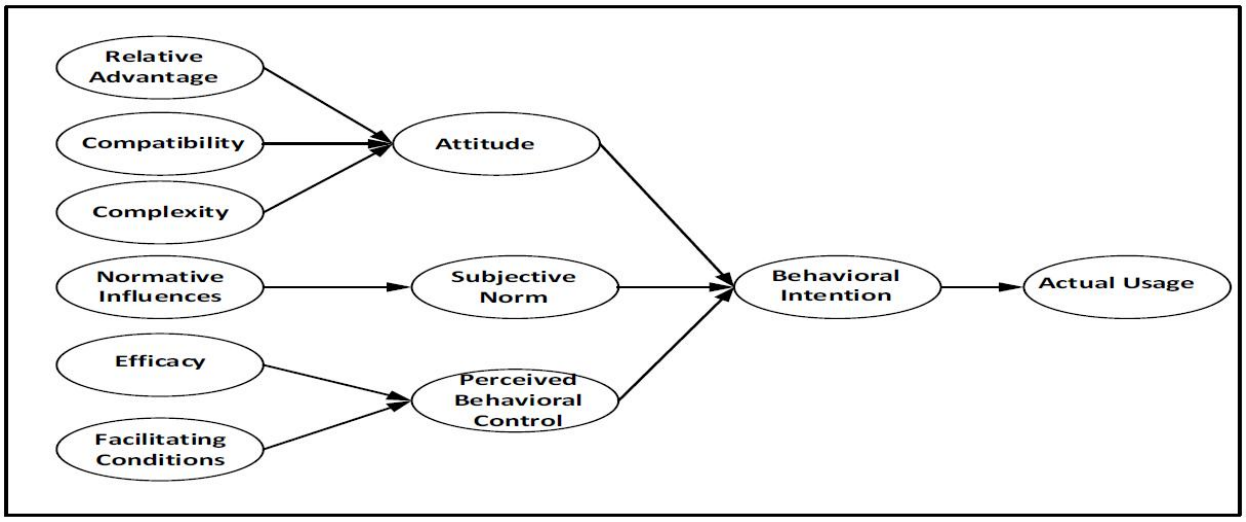

Figure 8: Decomposed model of theory of planned behavior(Shih & Fang, 2004)

2.6.4. Technology of Acceptance Model (TAM)

Postulated by Davis (1989), is by far the most widely used acceptance theory in Information Systems (IS) research as well as in other fields. In general, TAM tries to predict individuals' intentions toward using a technology behavior based on their perception of its Ease of Use (PEOU) and perceived Usefulness (PU) (Chuttur, 2009; Ghazizadeh, 2012).

Perceived usefulness refers to "The degree to which an individual believes that using a particular system would enhance his or her job performance" and perceived ease of use describes "the degree to which an individual believes that using a particular system would be free of physical and mental effort" (Davis, Bagozzi, & Warshaw, 1989).

A successful user interface design has potential implications concerning the perceived ease of use to the users. Can users pay easily and quickly? The system providers have to consider this question, in order to ensure users can use the systems effortlessly. Usability has been widely used to evaluate information systems (Venkatesh, Ramesh, & Anne, 2003). An easy to use interface is important for any application, especially for mobile applications (Chou, Lee, & Chung, 2004). This is because of the unique characteristics of mobile devices, such as screen size, input mechanisms, and battery consummation and so on. Systems developers have to give serious consideration to design guidance for mobile applications.

According to TAM, a user's acceptance of an information system is dependent on two factors: perceived usefulness and perceived ease of use. Together, these factors determine the attitude toward using the technology. This in turn affects the behavioral intention to use, which then leads to actual system use. A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive use-performance relationship. PEOU refers to the degree to which a prospective user believes that using a particular system would be free of effort. This follows from the definition of "ease": "freedom from difficulty or great effort". Effort is a finite resource that a person may allocate to the various activities for which he or she is responsible. All else being equal, an application perceived to be easier to use than another is more likely to be accepted by users.

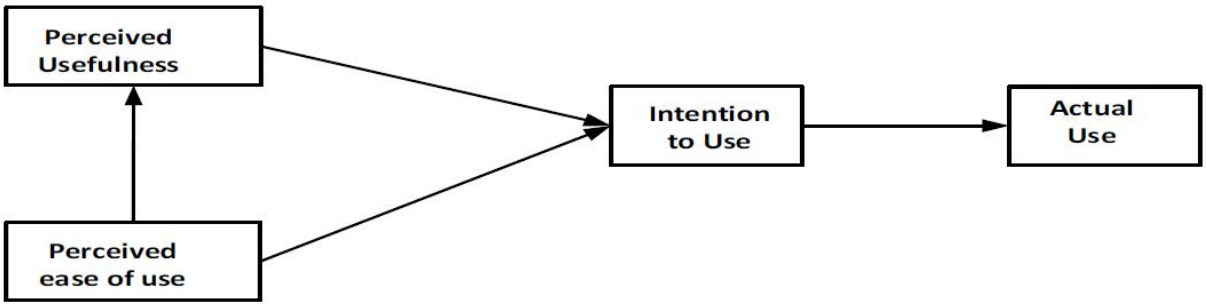

Figure 9: Technology Acceptance model (Davis, Bagozzi, & Warshaw, 1989)

2.6.5. Extension of Technology Acceptance Model (TAM2)

Venkatesh and Davis (2000) developed and tested a TAM2 model by including a number of determinants to Perceived Usefulness into the new model .It is a theoretical extension of the Technology Acceptance Model that explains Perceived Usefulness and Usage Intentions in terms of social influence processes (Subjective Norm, Voluntariness, and Image) and cognitive instrumental processes (Job Relevance, Output Quality, Result Demonstrability and Perceived Ease of Use). Longitudinal data were collected from four different organizations that spanned a range of industries, organizational contexts, functional areas, and types of system being introduced (Venkatesh & Davis, 2000). The results showed that all the above-mentioned social influences and cognitive instrumental processes have significantly influenced user acceptance of the systems.

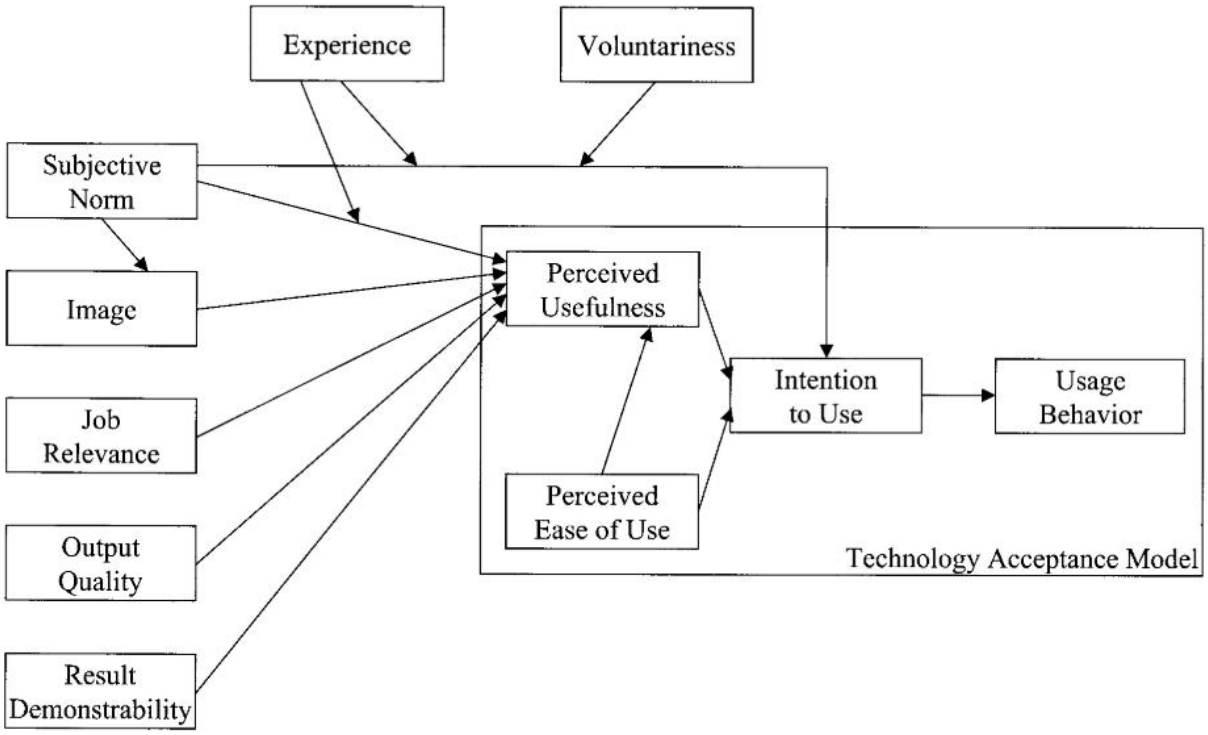

Figure 10: Extension of TAM (Venkatesh & Davis, 2000)

2.6.6. Diffusion on Innovation Theory (DIT)

Diffusion of Innovations Theory (DIT) was developed by Rogers (1995) to explain how the diffusion of innovations takes place in the social system. Adoption is defined by Rogers (1995) as an individual process detailing the series of stages one undergoes from first hearing about a product to finally adopting it. Diffusion signifies a group phenomenon, which suggests how an innovation spreads. As defined by Rogers (1995), there are five stages of adoption process: knowledge, persuasion, decision, implementation and confirmation. Also Rogers (1995) stated that three valuable insights, the quality of an innovation, peer to peer communication and understanding of the need of different user segments might be useful to diffuse and adopt the innovation. According to Rogers (1995), innovation compatibility with one's usual way of working and behaving is a factor to make individuals more likely to adopt the innovation.

Relative Advantage is to expresses to what degree the new technology or product is perceived as better than the existing product. In relative advantage there are number of sub dimensions like the degree of economic profitability, low initial cost, a decrease in discomfort, a savings in time

and effort, and the immediacy of the reward. The relative advantage of an innovation generally, as perceived by members of social system, is positively related to its rate of adoption (Rogers, 1995).

Compatibility indicates the degree which the technology service is perceived as consistent with sociocultural values and beliefs; with previous and present idea; and with client needs of innovation (Rogers, 1995). When an innovation provides alternative or supplementary products or services little effort is required to learn operation change that potential adopters are likely accept it (Chen, Adams, & Introduction, 2005).

Complexity defined complexity as the degree to which an innovation is perceived relatively difficult to understand and use (Rogers, 1995). It's as perceived by members of social system is negatively related to its rate of adoption. Complexity of innovation was negatively related to their rate of adoption than any other characteristics of the innovation except relative advantage. Some innovations are easily understood by most members of a social system and will be adopted quickly, whereas others may be more complicated and will be adopted more slowly (Nazari, Khosravi, & Babalhavaeji, 2013).

Trial-ability described as degree in which a new invention can be tested out on a limited time frame basis which is positively related to its adoption rate (Rogers, 1995). Potential adopters who are allowed to test with the innovation will feel more comfortable with it and more likely to adopt it.

Observability is described as the extent to which an innovation is visible to the social systems and the some belief can be easily observed and communicated, the more social system will adopt it; some can be difficult to be observed and communicated (Rogers, 1995). The perceived observability is related to the rate of adoption in a positive direction (Nazari et al., 2013).

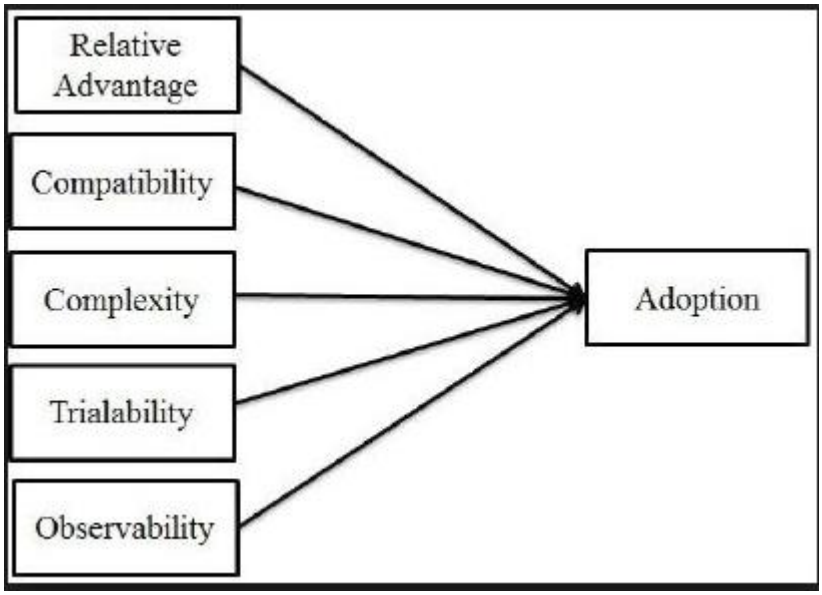

Figure 11: Diffusion of Innovation Theory Roger (1995)

2.6.7. Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al (2003) have taken another initiative by introducing user acceptance of information technology: toward a unified view. They argued that prior research having information technology (IT) acceptance as their central theme of the research introduced many competing models where each of which have different set of acceptance determinants (prediction variables). Therefore, in their study they combined several traditional IT acceptance theories in order to formulate a unified model. In the original UTAUT model, four core determinants of intention and usage and four other moderating variables acting as the key relationships were considered. The aim of formulating this theory is to provide a deeper understanding of individual and organizational acceptance of IT artifacts to researchers and managers. However, they introduced 'Performance Expectancy', 'Effort Expectancy', 'Social Influence', and 'Facilitating Conditions' as the core and direct determinants of user acceptance and usage behavior. Furthermore, they also introduced 'Gender', 'Age', 'Experience', and 'Voluntariness of Use' as the moderating factors where they can be used to understand the user acceptance and usage behavior (Ghazizadeh, 2012).

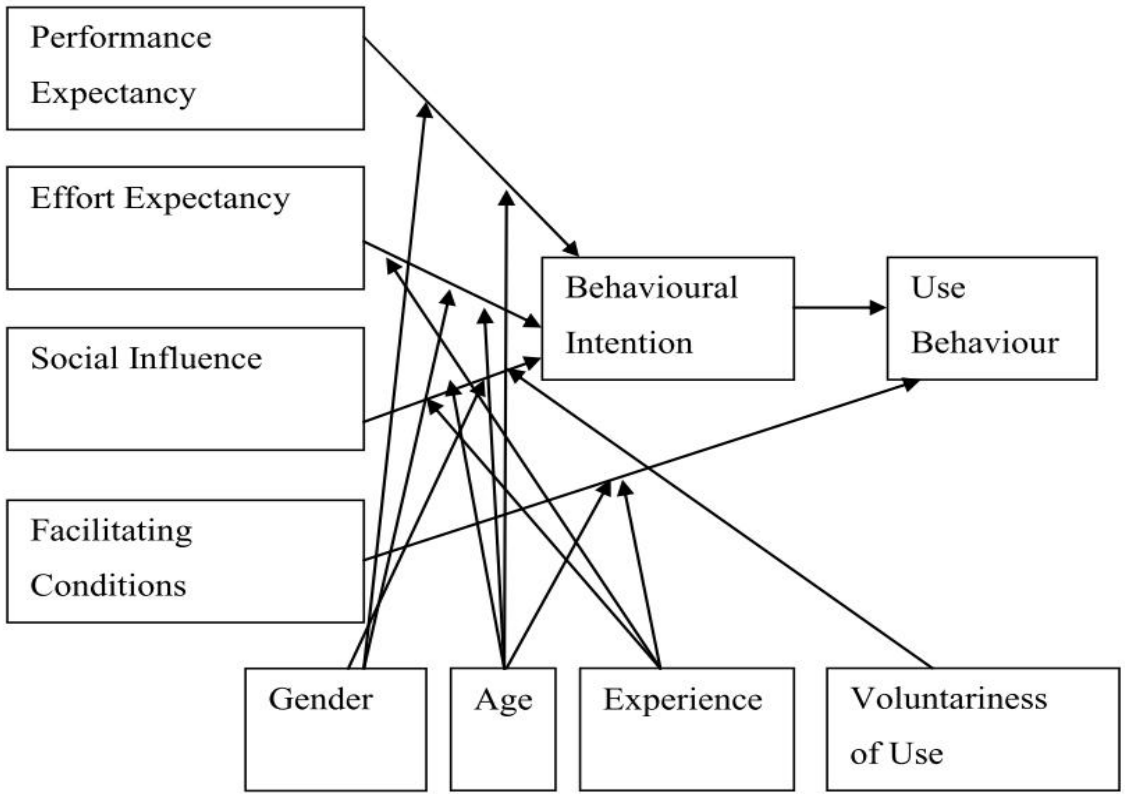

Figure 12: Unified Theory of Acceptance and Use of Technology (Ghazizadeh, 2012)

Performance Expectancy is the degree to which an individual believe that using a particular system or technology will improve the performance (Venkatesh, Morris, Davis, & Davis, 2003). It is worthwhile mentioning here that, 'Performance Expectancy' is similar to other acceptance models such as Perceived Usefulness in Technology Acceptance Model (TAM). Effort Expectancy is the degree of ease (easiness) of using a particular system or a technology, and it is similar to Perceived Ease of Use in TAM model. This construct for behavioral intention is strongly influenced by moderating factors such as 'Age', 'Gender, and 'Experience', a plausible reason is that younger women for instance, are more concerned with the usage of a new technology. Moreover, Social Influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system. Social influence is equivalent to Subjective Norm in Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) model. Finlay, Facilitating Conditions are defined as the degree to which an individual perceives that technical infrastructures can support the user to use the technology or a system. This construct is similar to perceived behavioral control in the Theory of Planned Behavioral (TBP).

2.6.8. Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)

UTAUT2 incorporates three constructs into UTAUT: hedonic motivation, price value, and habit. Individual differences name, age, gender, and experience are hypothesized to moderate the effects of these constructs on behavioral intention and technology use. Results showed that compared to UTAUT, the extensions proposed in UTAUT2 produced a substantial improvement in the variance explained in behavioral intention (56 percent to 74 percent) and technology use (40 percent to 52 percent). Further, (Venkatesh, James Y.L., & Xu, 2012) also revealed that the impact of hedonic motivation on behavioral intention is moderated by age, gender, and experience, the effect of price value on behavioral intention is moderated by age and gender, and, habit has both direct and mediated effects on technology use, and these effects are moderated by individual differences. The UTAUT2 model, developed by Venkatesh et al. (2012) incorporated three new constructs into UTAUT: hedonic motivation, price value and habit. According to Venkatesh et al. (2012), hedonic motivation will complement UTAUT's strongest predictor that emphasizes utility. Furthermore, contradictory to workers in an organization, consumers have to pay the costs and these can be of an influence to the consumer's decisions. By adding a construct that is related to price and costs will complement UTAUT's existing resource considerations that focus only on time and effort. Finally, habit as another critical predictor of technology use will complement the focus on intentionality as the overarching mechanism and key driver of behavior (Venkatesh et al., 2012).

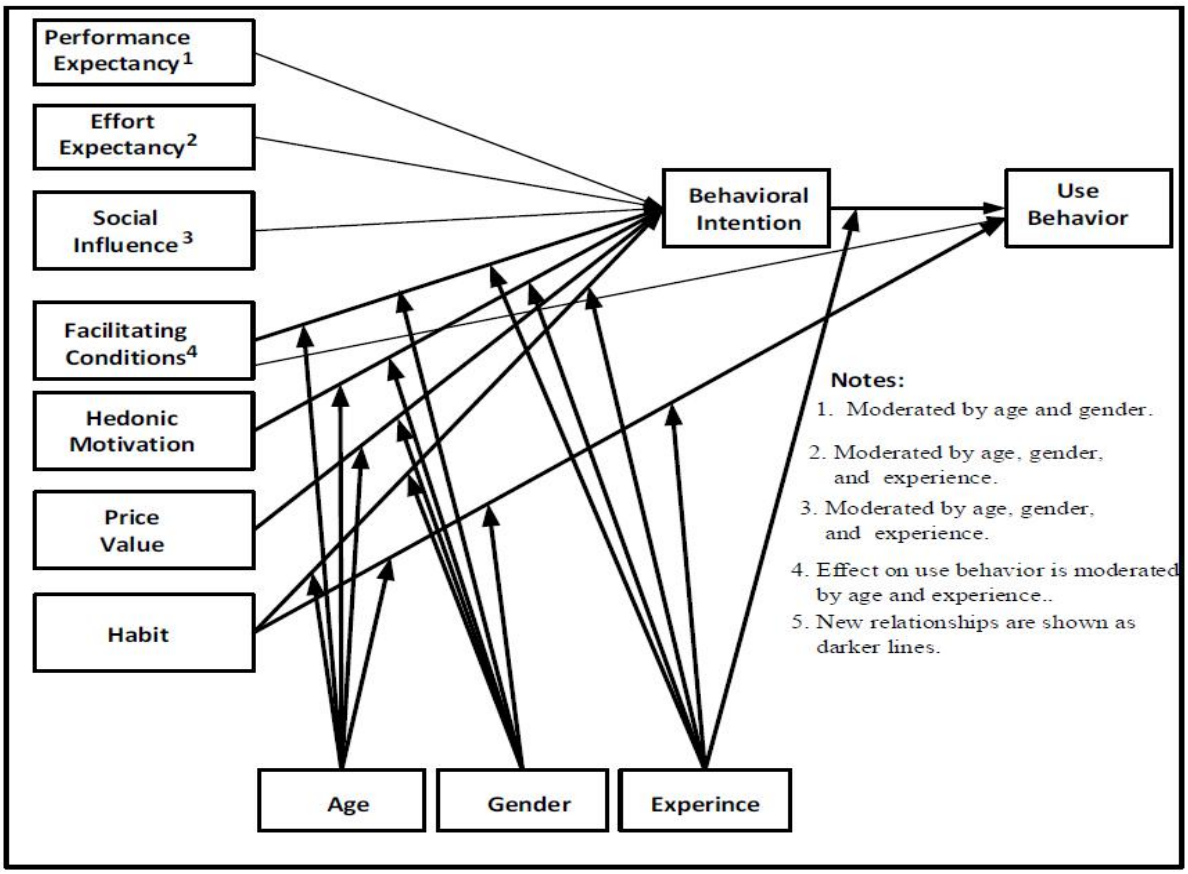

Figure 13: UTAUT2 Model (Venkatesh et al., 2012)

2.7. Mobile Payment in Developed and Developing Countries

Mobile payments are considered to be at the tipping point where without any denials they are becoming hot or even hotter than any recent technology. The mobile payment penetration rate is more in Non-European market when compared to European Market due to the financial and economic conditions of the people. Especially regions where there is a lack of alternative payment methods are seen to have strong potential. Most of the people in these regions don't have access to basic banking facility, so they have to depend upon an alternate system which provides similar services ,just like the ones provided by the banks. This led to a mobile payment which gained huge popularity among the people from rural areas. This system was also way cheaper than the traditional payment method. But it depends on the operators to define specific strategies, to specific local communities since the same business models don't bring success. Added to it, it involves only a basic mobile phone

with SMS method of payment and was easy to use. So, the mobile payment penetration rate started to increase from 2007 onwards in Kenya (Chaix & Torre, 2015; Gupta, 2013; Karthikeyan, 2012; Winn & Koker, 2013).

This scenario is applicable for Philippines and Kenyan market, where people have got them adopted to this way of mobile transactions. With respect to Indian market, there is equal distribution of people with banked and unbanked facilities. Instead, the rural people have started using mobile payment method and it has mounted to 8% of the total rate where still many researchers predict that India has large potential in mobile payments. Turkey has similar strategy where the penetration rate of 3% as the focus is on the contactless based system and all such systems are in development phase. In European market the condition is totally different where these countries have good banking infrastructure and these forms a major hindering factor for growth of mobile payments. The usage of mobile payments in these regions is very less and this might be due to lack of standardization among the actors and absence of clear business models according to local market (Bash et al., 2015; Donovan, 2012; Karthikeyan, 2012).

2.8. Mobile Payment in Ethiopia

Ethiopia is one of the fastest growing and second most populated African Counties. There is a huge gap between financial service provision and service demand from citizens. Certainly the banking industry in Ethiopia is introducing mobile payment systems to serve customers to incur better income. For instance CBE Birr of CBE, Amole of Dashen Bank, UNBirr of UB, etc… Beside M-payment system banks are coming up with mobile Wallet technology. The M-payment system banks are offering is USSD based technology and bank centric level except not yet fully implemented. Since bank centric technology is processed as the billing for the purchase of services and goods settlement will occur from bank account of the client as credit/loan based. With the existing implemented m-payment also not much adopted more of in rural areas for these reasons and others banks are forced to open branches to reach out to customers. Even in Addis Ababa the branch opening is highly increasing which is costly for the bank compared to m-payment implementation. Non-bank based MBirr is showing a promising implementation and adoption better than the banks. According to Tekabe and Gadise (2016) many of the customers

have low or no level of textual literacy, and they have no prior exposure to computing technology. In addition to the problem of illiteracy, there are many languages in the country, predominantly, Amharic, Oromigna, Tigrina, Somali, and Guaragigna that challenges digital communication (Sherferahu & Gezu, 2016).

2.9. Related Work

Multiple researches reveal that research on e-payment has been more focused on Internet banking and mobile banking. Whereas on mobile payment, because of the nature of the business, it is becoming difficult to find specific finding that fits commonly since m-payment has multiple ecosystem (Dahlberg et al., 2014; ÖRS, 2018).

With the development of m-payment market Dahlberg et al. (2014), amended the frame work of Jayawardhena & Foley (2000) and Javalgi & Ramsey (2001) to analyze the additional factor that impact the market, and gave directions for future research. To facilitate the analysis, the researchers proposed a framework of four contingency technological, social/cultural, commercial, and legal/regulatory/standardization are beyond the control of individual market participants and five competitive factors.

Mallat (2006), explored consumer adoption of mobile payments by empirically examining the adoption determinants of DOI model especially on relative advantage, complexity, and compatibility constructs have provided the most consistent explanation on the technology adoption decision that are specific for the mobile payment context. (Mallat, 2006) the empirical data for the explorative study was collected by establishing six focus group sessions by age. The results suggest that the relative advantages of mobile payments include time and place independence, availability, possibilities for remote purchases, and queue avoidance. The interviewees found mobile payments to be mostly compatible with digital content and service purchases and to complement small value cash payments. Interestingly, the findings suggest that the relative advantages of mobile payments depend on certain situational factors such as lack of other payment methods or urgency. There are, however, several barriers to the adoption of mobile payments, including premium pricing of the payments, complexity of payment procedures, a lack of widespread merchant acceptance, and perceived risks. Mallat (2006), concluded that relative advantage have positive, compatibility & perceived trust does not have

positive and complexity, perceived cost, network existence & perceived risk does not have negative effect on adoption of m-payment. In this paper it lacks attitude toward each of the determinant before adoption of m-payment. Since attitude of adopters rely on the determinants of DOI as well.

The objectives of Ting et. al. (2016) were firstly, to determine the effect of antecedent variables on intention towards m-payment system using the theory of planned behavior (TPB) and past literature as the underlying basis, and secondly, to assess the difference between two most dominant ethnic groups in the country, namely Malays and Chinese, on the subject matter Mobile users were the target population. Non-probability sampling using purposive sampling technique was used to sample Malays and Chinese who owned mobile devices (Ting, Yacob, Liew, & Ming, 2016). The authors used the data of 311 respondents of which 66 never used online payment. With the analysis of data the author concluded that all belief variables are found to be positively related to independent variable. The finding of Ting et. al. (2016), showed that all independent variables are positive related to intention with more than 70% variance explained. Beside TPB with additional model attribute could be a better assessment on adoption factors.

There are limited number of studies conducted in Ethiopia on the adoption of E-payment specifically m-payment adoption. Wondwossen & Tsegai (2005) studied on the challenges and opportunities of E-payments in Ethiopia; their objective was studying of E-payment practices in Ethiopia. The authors employed interview and on site observation to investigate challenges to E-payment in Ethiopia and found that, the main obstacles to the development of E-payments are, lack of customers trust in the initiatives (Wondwossen & Tsegai, 2005), Unavailability of payment laws and regulations particularly for E-payment, Lack of skilled manpower and Frequent power disruption. According to Wondwossen & Tsegai (2005), an adequate legal structure and security framework could foster the use of E-payments. As the authors generalized during study on the challenges of e-payment not specifically to the technologies of payment since in the perception of risk and trust depends on the regulatory or service provider institution.

According to Nebat (2016), examines the existing financial system in Ethiopia and presents a framework for Mobile-Payment which can be interoperable with the current financial system. M-payment can be introduced as an alternative to the cash based financial system in the cities and for the banked peoples as well. During the research an intensive study has been done on

successful m-payment systems to understand the concept deeply and to learn from their experience. The existing financial system and the legal framework of the country for financial institutions also have been studied in order to make appropriate m-payment framework for Ethiopia. The framework was developed as to fit into existing financial system of the country by introducing a new party, which is the Mobile-payment service provider. Currently the bank system and financial system is locked. As finding of the research bank-led type is allowed in the country with the only reason being to enable banks to build their capacity, and it is believed that banks cannot be competent with technology providers. But when the banks have enough capacity and enough awareness is created on the population about Mobile Financial Solution. The framework m-payment service provider lies in the business process layer between the consumer and the settlement organ. Also the researcher used one bank, Lion International Bank, for study and suggested adoption and security areas has to be done detail research. The researcher could view mostly service provider side from the ecosystem but during development of framework each ecosystem enrollment should be in consideration. In addition it has been view from Bank-led perspective of the model.

To sum up, the related works differ across countries and the variables they included. In most cases, however, they have come across related conclusions on the factors affecting mobile payment adoption. Therefore, this study attempts to examine mobile payment adoption in the Ethiopian consumer society, by incorporating the determinant factors of DOI, TAM & IFSF. Moreover, risk and trust perception of customers of different age & knowledge categories towards the payment technologies is assessed. Since m-payment has multiple ecosystems, this research focuses on consumer perspective in all m-payment service providers and is not limited to Bank-led perspective of the model.

CHAPTER THREE

HYPOTHESIS AND RESEARCH MODEL

Hypothesis are predictions of the outcomes from the study. It is useful at the outset to specify the hypotheses in terms of the assumed relations between variables so as to clarify the position and pre-understanding of the researcher. If statistical tests are to be conducted formulation of hypotheses is a crucial element of the research design. Hypotheses can be derived from theory, model, experience or knowledge concerning contextual factors (Larsen & Davide, 2006).

3.1. Hypothesis Development

According to IFSF (2014), in order to make mobile payment service acceptable in the market it should have a lot of good characteristics that can attract customers. The first is that the mobile payment service should be simple and usable with friendly GUI that have a small learning curve and enable personalization according to the users' need. The second is universality which implies that the system should allow both low-value and high-value payments and cover domestic, regional and global environments. The third is interoperability; the system should be able to interact with other systems and should be based on open standards and technologies. The fourth is security, privacy and trust. Security implies that the system should be bullet proofl, resistant to inside and outside attacks from hackers and terrorists. Privacy is attained when recorded transactions are not available to the public that is confidentiality of credit histories and spending patterns of the customer. Trust requires making the customer understand how their information is protected and their credit or debit card information is not misused. The fifth is that the cost of the usability of system should be lower than the existing system and should compete with other modes of payments in terms of cost and convenience. Sixth, the speed should be acceptable to customers and merchants. And the last is it should provide cross boarder payments, i.e. it must be available globally (IFSF, 2014).

After considering the concept of technology acceptance models specifically combining TAM model along with DOI, and IFSF (2014), this paper attempts to investigate factors affecting consumer mobile payment adoption in Ethiopia. As a result, the factors affecting consumer mobile payment adoption considered in this study are relative advantage, compatibility,

perceived ease of use (complexity), perceived usefulness, perceived cost, perceived trust, perceived risk, behavioral intension and attitude.

Relative Advantage

Relative advantage is to express to what extent the new technology or product is perceived as better than the existing product. In relative advantage there are number of sub dimensions like the degree of economic profitability, low initial cost, a decrease in discomfort, a savings in time and effort, and the immediacy of the reward. The relative advantage of an innovation generally, as perceived by members of social system, is positively related to its rate of adoption (Rogers, 1995). The potential adopters' can gain an economic and social advantage, if an innovation is undoubtedly advantageous (Rogers, 1995). Unsurprisingly, the potential adaptors realize that the new products or services are more advantageous and useful than existing similar products or services, it can be predicted that they will accept it. Mobile payments are likely offer relative advantage services for consumers. For example, use of mobile phones is seemingly became part of our daily activities, where the device is not only a communication tool, but also an electronic wallet (Chen et al., 2005).

H1: The relative advantage of using mobile payment positively affects the attitude towards using the technology.

Compatibility

Compatibility indicates the degree which the technology service is perceived as consistent with socio cultural values and beliefs; with previous and present idea; and with client needs of innovation (Rogers, 1995). When an innovation provides alternative or supplementary products or services little effort is required to learn operation or behavior change, potential adopters are likely to accept it (Chen et al., 2005). Using mobile payment systems only require understanding operation procedures and application areas, and it does not change users' behavior with payment activities.

H2: Compatibility of mobile payment positively affects the attitude towards using the technology.

Perceived Ease of Use

Perceived ease of user is defined as the degree to which a person believes that using a particular system would be free from difficulty that is, utilizing a specific technology (like mobile payment) would be free of physical and mental exertion (Davis, 1989). Complexity of innovation was negatively related to their rate of adoption. Some innovations are easily understood by most members of a social system and will be adopted quickly, whereas others may be more complicated and will be adopted more slowly (Nazari et al., 2013). The user may accept that a given innovation (such as mobile payment) is helpful, but while using the mobile, the user may find out that the innovation may be difficult to use. For instance, the object on mobile screen may be difficult to see. Ease of use is the user's impression of the measure of requirement needed to use a technology or the degree to which a user accepts that utilizing a specific innovation will be effortless and smooth (Davis, 1989).

H3: The perceived ease of use positively affects the attitude toward m-payment technology.

Perceived Usefulness

Perceived usefulness is “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989). Perceived usefulness explains the user's recognition that the interactive mobile payment adoption will enhance their task performance in purchase of goods and mobile cash. The user has a view of how valuable the innovation is in making payment anywhere at any time with their mobile devices connected with Internet. Users seamlessly purchase products or services without having to physically handover cash or swipe a card. Consumers are eager for quick, in-and-out shopping experiences.

H4: The perceived usefulness of the use of mobile payments positively affects the attitude toward using technology.

Perceived Cost

Perceived Cost is the perceived expenditure in the actual customer consumption process. It is the sum of costs including time, money, physical strength, energy, psychology and other costs for the customers in the consumption process of the products or services. Customer perceived cost refers to product or service price which the customer actually paid (Zhihong,Wang Haomin, 2016).

H5: The perceived cost of the use of mobile payments positively affects the behavioral intention toward using technology.

Perceived Trust

Due to inherent nature of mobile payments, trust is believed to influence directly or indirectly the intention of adoption and acceptance of mobile payments because mobile services are exposed to various uncertainties and uncontrollable consequences. These include loss and theft of mobile devices resulting in identity theft inconveniences such as frustration and unavailability of mobile payment services caused by network failure, data pilfering attacks, to name just a few examples (Anthony & Mutalemwa, 2014).

H6: The perceived trust of using of mobile payments positively affects the behavioral intention toward using technology.

Perceived Risk

Perceived risk in consumer adoption intention of financial technology has three important dimensions: security, privacy and monetary. Perceived privacy risk defined the possibility that inline businesses might use personal information inappropriately invading consumer's privacy with m-payment consumers authorize retailer to use their personal information and gain access to their bank account (Nyshadham, 2000; Thakur & Srivastava, 2014). Consumers can be concerned about potential risk related to privacy losses due to loss of control over personal information and transaction these leads that consumers evaluation to financial technology to judge its risk high and adoption benefit low (De Kerviler et al., 2016). Privacy is another major consumer concern in m-payment adoption because much private information, like phone numbers, social security numbers, pin code, consumption locations, shopping records, etc., is required in the m-payment process. Such information could be exposed or maliciously used if it fell into the wrong hands (Yang et al., 2015). Perceived financial risk refers to consumer perception about the possible monetary loss caused by the usage of m-payment (Featherman & Pavlou, 2003). The transfer of money between accounts in m-payment may raise great concern about financial information, such as accounts and passwords being stolen and the subsequent the risk of losing money (Yang et al., 2015).

H7: The perceived risk using mobile payments positively affects the behavioral intention toward using technology.

Attitudes

According to Kim, Chun & Song (2009), attitude is defined as an individual's positive or negative evaluation of new technology adoption of acceptance. Attitude toward adoption is the cognitive process which depicts the prospective adopter's affection about adopting new technology (Kai-ming au & Enderwick, 2000; Kim, Chun, & Song, 2009). Attitude toward adoption is hypothesized in different beliefs perceived ease of use, adoptive experience, perceived usefulness, relative advantage and compatibility. In mobile payment adoption attitude may affect positively or negatively can to the use of the technology (Kai-ming au & Enderwick, 2000).

H8: The attitude towards mobile payments positively affect the adoption to use mobile payment technology.

Behavioral Intention

The concept of behavioral intention first appeared in the theory of reasoned action (TRA). It shows that behavioral intention is decided by subjective norms and attitude (Ajzen & Fishbein, 1977). Meanwhile, behavioral intention leads to behavior indication. Behavioral intention refers to individuals making subjective determination when he or she needs to take a particular behavior. It reflects the willingness of the individual conducting a particular behavior.

H9: The behavioral intention towards mobile payment positively affects the adoption to use mobile payment technology.

3.2. Research Model

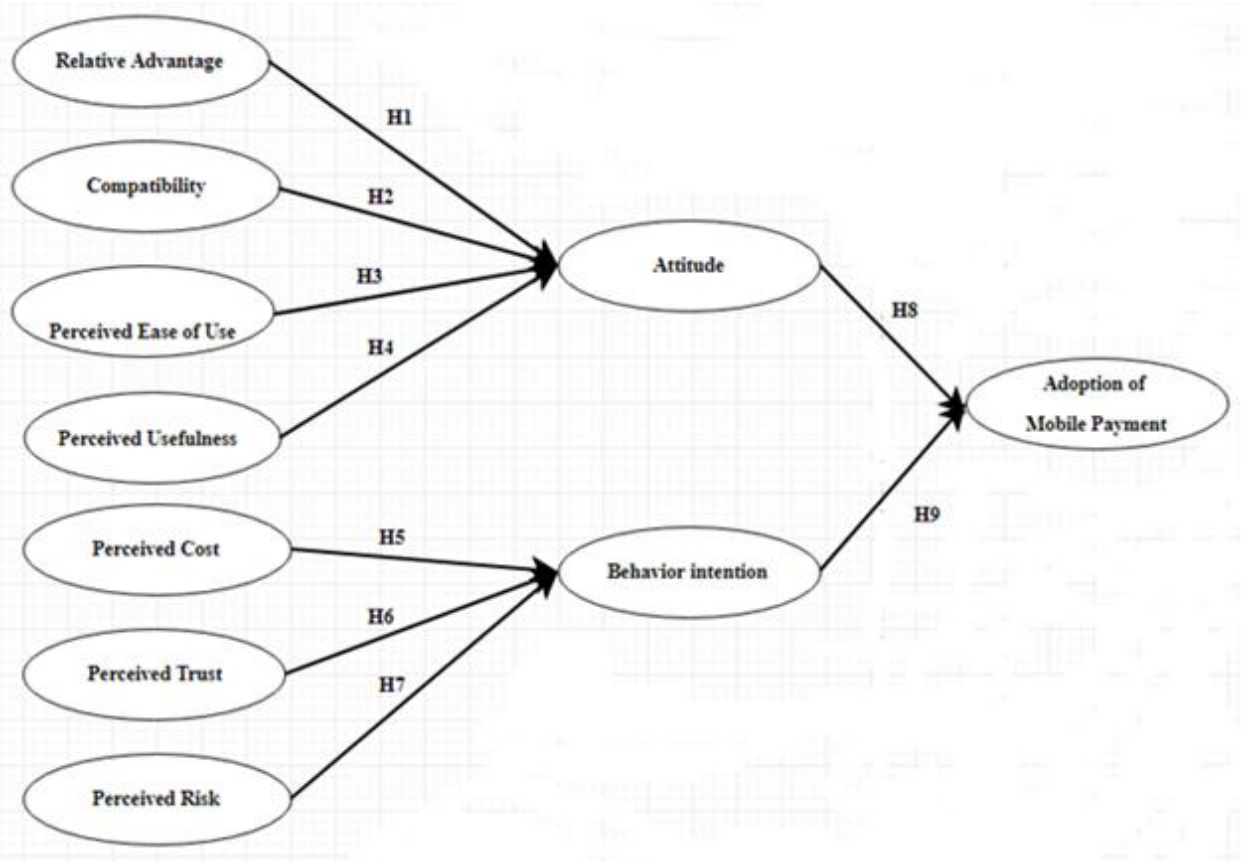

Figure 14: Proposed Research Model

CHAPTER FOUR

RESEARCH DESIGN AND METHODOLOGY

This chapter describes the research design and methodology employed for the study.

4.1. The Research Method

Based on the study problems and objectives set, an empirical research method with deductive approach is employed to assess factors influencing mobile payment adoption. According to Ghauri, Gronhaug & Kristianslund (1995), research methods refer to the systematic, focused and orderly collection of data for the purpose of obtaining information from it, to solve/answer research problems or questions. The objective of the research is best achieved with a suitable methodology and method (Hirsjärvi, Remes, & Sajavaara, 2014). Basically, there are two differing ways to conduct research: empirical and theoretical. This study takes the path of empirical research.

Hence, this method is assumed to be helpful to obtain and analyze information about factors affecting mobile payment adoption of customers with a focus on household users of CBE Birr at Commercial Bank of Ethiopia and Amole at Dashen Bank both from bank centric as well as MBirr from non-bank centric in Addis Ababa. In order to successfully address the aim, and come up with valid and reliable results, the research is designed so as to have quantitative nature. A survey is employed in order to analyze the factors behind mobile payment adoption. Its cost effectiveness and technical feasibility in gathering and generation of numerical data are among the key benefits behind the selection of the survey method. Therefore, a cross sectional survey is used in the study.

4.2. Sources of Data

Both primary and secondary data are used in the analysis. Commercial Bank of Ethiopia, Dashen Bank and MBirr customers in Addis Ababa were used as sources for primary data. On the other hand, secondary data was obtained from the website and publications of Commercial Bank of Ethiopia Dashen Bank and MBirr. In addition, journals, books, published & unpublished materials that contain data related to adoption of mobile payment of customers were reviewed as secondary data sources.

4.3. Sample and Sampling Techniques

4.3.1. Sample

As of end of November 2018, number of consumer m-payment accounts of CBE stood at 573,630 that of DB stood at 153,821 and that of MBirr stood at 181,782. Thus, total of m-payment accounts of consumer users in the three selected companies has been 909,233.

In order to determine the sample size, we used the formula recommended by Yamane (1973) as cited by (Israel, 1992)

$n = N/ (1+N*e^2)$

Where,

- n is sample size
- N is total population
- e^2 is probability of an error

Thus, the sample size for this study is determined as follows:

n = 909,233/ (1+909,233x0.05^2)

= 399.8 ≈ 400 customers.

Therefore, with N = 909,233 and e = 5% (at least 95% confidence level) the sample size is 400. Out of these m-payment accounts, CBE customers accounted for about 63.1 percent, while DB covers 16.9 percent and MBirr 20 percent registered consumers in Addis Ababa. Proportional distribution is used to avoid possible biases in selecting respondent.

4.3.2. Sampling Techniques

In order to ensure manageability of the research process and guarantee the successful achievement of reliable outcome, stratified random sampling as well as simple random sampling techniques were used for the selection of private bank and study participants. Accordingly, populations of the study which are consumer m-payment users at the specified companies are split into three segments or more appropriately strata.

These strata were government bank, private bank and non-bank active m-payment accounts of customers in Addis Ababa. These segments are chosen in order to divide the population into important categories relevant to the research interest. Proportion of government bank, private bank and non-bank consumer accounts from the total questionnaires to be distributed is determined based on their respective share from total accounts. Accordingly, 63.1 percent of the questionnaires are distributed to consumer m-payment users at CBE, 16.9 percent of the questionnaires distributed to consumer m-payment users at DB whereas the remaining 20 percent distributed to consumer m-payment users at MBirr.

The three strata are supposed to reflect the interest of different customers: government bank m-payments, private bank m-payment and non-bank centric m-payment. Then simple random sampling technique adopted to select sample respondents from each stratum. In this case the simple random sampling is expected to give equal chance of selection for each members of a stratum and helped avoid biasness.

4.4. Instruments and Procedures of Data Collection

4.4.1. Instrument of Data Collection

Both closed and open ended questionnaires are employed to collect available information that support the study. The questionnaire is adopted based on previous similar studies(Aydin, 2016; Daştan & Gürler, 2016; Pousttchi, Wiedemann, & Wiedeman, 2007) and personal experience of the researcher. The questionnaire used in this study is attached in appendix A.

4.4.2. Procedures of Data Collection

Once the adopted questionnaire is developed as a data gathering tool, a pilot test is conducted to weigh the appropriateness of the data gathering tool. To detect ambiguous and unclear statements and thereby to improve the quality of the questionnaire, a draft questionnaire was first administered at DB customers as a pilot test. Ten respondents, that are not included in the final study, are randomly selected from customers of the same bank to participate in the pilot test. The data gathering tools are improved based on feedback from the pilot test. Finally, after discussion and confirming the willingness of the service provider companies, the questionnaires are distributed and collected through them.

4.5. Data Analysis Method

Data remains worthless mass of material without proper analysis. Data analysis consists of examining, categorizing, tabulating, or otherwise recombining the evidence to address the initial proposition of a study (Yin, 2014). The purpose of analyzing data is to find answers to questions and link information from a mass of data Consequently, the data that was gathered through questionnaires was entered into Statistical Package for Social Sciences (SPSS) version 23.0 mainly for demographic and strata analysis. In this study, beside SPSS a SmartPLS analysis is used to test the proposed research model and hypotheses as well as reliability and validity tests.

Partial Least Squares (PLS), developed in 1960s by Herman World, that enables researchers to answer a set of interrelated research questions by modeling the relationships among multiple independent and dependent constructs simultaneously (Gefen & Boudreau, 2000; Glocker, 2012). PLS is widely used in social sciences and information systems research to test the statistical quality and standard of result.

The PLS procedure, as one of the Structural Equation Modeling (SEM) techniques, has been gaining interest and use among researchers in recent years because of its ability to model latent constructs under conditions of non-normality and small to medium sample sizes. It allows to determine the relationships between independent and dependent latent variables as linear composites, much like multiple regression multivariate techniques (Kwong-Kay Wong, 2013). It also allows the researchers to both specify the relationship among the conceptual factors of interest and the measures underlying each construct. In this study, based on the above benefits PLS is used to analyze relationship between the selected variables.

The survey data were manually typed into Microsoft Excel 2010 and then exported to SPSS to use the data for demographic and other scale analysis. These data are also used for SmartPLS with .csv file format. A total of 45 (RA1, RA2, CM1 …) indicators are used to test for the nine variables. In addition, a new variable of Adoption of Mobile Payment (AMP) is tested by computing average value of the different indicators separately for each variable. Thus, the AMP was tested with nine different indicators.

CHAPTER FIVE

DATA ANALYSIS AND PRESENTATION

This chapter describes analysis, presentation and interpretation of data. The points dealt with in the chapter were the general characteristics of the sample population and the computed results and findings in regards to factors that affect m-payment adoption by consumers in Ethiopia based on the collected data.

5.1. Respondents Demographic Characteristics

In total, 400 questionnaires were distributed to customers of mobile payment in Addis Ababa, 393 of them were returned and are valid from the strata. All the collected questionnaires were used to conduct data analysis, resulting in a response rate of 98.25%. In this study, to analyze the demographic and strata SPSS descriptive analysis is used.

The demographic variables used in this study are Age, Gender, Educational level and strata of respondents (see Table 1). Based on the demographics and other personal background information obtained, the majority (57.8%) of the respondents were female, 42.2% were male. The highest number of respondents (65.5.0%) comprise of the age group of 21 to 30 years.

Table 1: Demographic characteristics of respondent

Variables	Classification of Variables	Frequency	Percentage
Gender	Female	227	57.8
	Male	166	42.2
Age	20 Years or less	107	27.2
	21 to 30 Years	124	31.6
	31 to 40 Years	114	29.0
	41 Years and above	48	12.2

Variables	Classification of Variables	Frequency	Percentage
Educational Level	Primary School	21	5.3
	Secondary School	100	25.4
	Degree	126	32.1
	Master's Degree or above	146	37.2
Strata	Government Bank	247	62.8
	Private Bank	68	17.3
	Non-Bank	78	19.8

5.2. Reliability and Validity Test

5.2.1. Reliability Test

Reliability concerns the extent to which a measurement of a phenomenon provides stable and consistent result (Heale & Twycross, 2015). Reliability is also concerned with repeatability under constant conditions. Testing for reliability is important as it refers to the consistency across the parts of a measuring instrument (Taherdoost, 2016). Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. In this study, the reliability test used as internal consistency measure is Cronbach's Alpha coefficient with a cutoff value of 0.6 and Composite Reliability with cutoff value of 0.7 as recommended (Fornell & Larcker, 1981) and SmartPLS software.

In the measurement model composite reliability ranged from 0.840 to 0.931 and Cronbach's alpha range of 0.720 to 0.908. Therefore, high levels of internal consistency and reliability have been demonstrated among all reflective latent variables (see Table 2). Outer loadings for indicators of reflective constructs show individual indicator's reliability (see Figure 15). The reflective constructs are more than minimum acceptable value (0.7) except for PEU5 and PR3.

Table 2: Reliability Test

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Adoption/Actual use of Mobile Payment	0.784	0.903	0.823
Attitude	0.886	0.913	0.637
Behavioral intention	0.908	0.931	0.730
Compatibility	0.784	0.874	0.698
Perceived Cost	0.844	0.889	0.616
Perceive Ease of Use	0.746	0.840	0.567
Perceived Risk	0.720	0.836	0.543
Perceived Trust	0.866	0.903	0.652
Perceived usefulness	0.837	0.884	0.605
Relative Advantage	0.863	0.897	0.594

5.2.2. Validity Test

Validity explains how well the collected data covers the actual area of investigation with subtypes face validity, criterion validity, content and construct validity (Ghauri & Gronhaug, 2005). Validity is determined to assess if items in an instrument reflect or measure the content it is designed to which the instrument will be generalized (Taherdoost, 2016). Construct validity is an issue of operationalization or measurement between constructs. Construct validity refers to how well you translated or transformed a concept, idea, or behavior that is a construct into a functioning and operating reality (Ghauri & Gronhaug, 2005; Taherdoost, 2016). The concern is that instrument items selected for a given construct are, considered together and compared to other latent constructs. The two elements of construct validity used here are convergent validity and discriminant validity as they are widely recommended (Straub, Gefen, & Boudreau, 2004).

a) Convergent Validity

Convergent validity in behavioral science referred as constructs that are expected to be related are, in fact, related (Ghauri & Gronhaug, 2005; Taherdoost, 2016). Convergent validity can be tested by examining the factor loading not less than 0.70 and average variance extracted (AVE) of exceeding 0.5 (Fornell & Larcker, 1981; Hair, Sarstedt, Ringle, & Mena, 2012). From all the constructs with multiple reflective measures, 2 items (or indicators) were removed from the model as their outer loading was below 0.7. These indicators along with respective calculated figures of outer loading are indicated below (see Table 3). Thereafter, the SmartPLS is executed again and the generated results were presented in Table 4 with all results showing values above the threshold, therefore, demonstrating convergent validity.

Table 3: Eliminated constructs of outer loading

Construct	Indicator	Outer Loading
Perceived Ease of Use	PEU5 <- AT	0.655
Perceived Risk	PR3 <- PR	0.695

Table 4: Result of Convergent Validity test

Construct	Indicator	Outer Loading
Adoption/Actual use of MP	ATAV <- AMP	0.907
	BIAV <- AMP	0.907
Attitude	AT1 <- AT	0.788
	AT2 <- AT	0.823
	AT3 <- AT	0.806
	AT4 <- AT	0.791
	AT5 <- AT	0.785
	AT6 <- AT	0.795
Behavioral Intention	BI1 <- BI	0.85
	BI2 <- BI	0.838
	BI3 <- BI	0.863
	BI4 <- BI	0.861

Construct	Indicator	Outer Loading
	BI5 <- BI	0.86
Compatibility	CM1 <- CM	0.827
	CM2 <- CM	0.835
	CM3 <- CM	0.844
Perceived Cost	PC1 <- PC	0.725
	PC2 <- PC	0.749
	PC3 <- PC	0.833
	PC4 <- PC	0.834
	PC5 <- PC	0.775
Perceived Ease of Use	PEU1 <- PEU	0.771
	PEU2 <- PEU	0.746
	PEU3 <- PEU	0.728
	PEU4 <- PEU	0.768
Perceived Risk	PR1 <- PR	0.724
	PR2 <- PR	0.771
	PR4 <- PR	0.736
	PR5 <- PR	0.716
Perceived Trust	PT1 <- PT	0.82
	PT2 <- PT	0.78
	PT3 <- PT	0.801
	PT4 <- PT	0.824
	PT5 <- PT	0.81
Perceived Usefulness	PU1 <- PU	0.768
	PU2 <- PU	0.789
	PU3 <- PU	0.747
	PU4 <- PU	0.803
	PU5 <- PU	0.78
Relative Advantage	RA1 <- RA	0.774

Construct	Indicator	Outer Loading
	RA2 <- RA	0.81
	RA3 <- RA	0.76
	RA4 <- RA	0.781
	RA5 <- RA	0.727
	RA6 <- RA	0.768

b) Discriminant Validity

Discriminant validity is the extent that measures of different constructs diverge or minimally correlate with one another. In PLS examination of cross-loading and the Fornell-Larcker criterion are dominant approaches to evaluate discriminant validity. At a minimum, no indicator variable should have a higher correlation with another latent variable than with its own latent variable. If it does, the model is inappropriately specified (David, 2016). As can be seen from Table 5 below, all the indicator variables have a lower correlation with other latent variables than its own latent variable. Thus, it is safe to conclude that the model is appropriately specified.

In the examination of cross-loading, correlation of the latent variables score with measurement item need to show an appropriate pattern of loading (Henseler, Ringle, & Sarstedt, 2014).

Table 5: Indicator item Cross Loading

Indicators	AMP	AT	BI	CM	PC	PEU	PR	PT	PU	RA
ATAV	**0.907**	0.851	0.723	0.555	0.494	0.568	0.578	0.675	0.500	0.717
BIAV	**0.907**	0.698	0.851	0.553	0.361	0.671	0.699	0.678	0.384	0.666
AT1	0.696	**0.787**	0.566	0.499	0.415	0.442	0.457	0.555	0.438	0.589
AT2	0.752	**0.822**	0.650	0.498	0.463	0.523	0.538	0.603	0.468	0.650
AT3	0.737	**0.805**	0.640	0.469	0.431	0.510	0.495	0.538	0.454	0.603
AT4	0.718	**0.791**	0.613	0.457	0.445	0.439	0.455	0.545	0.479	0.608
AT5	0.731	**0.785**	0.644	0.406	0.399	0.522	0.514	0.527	0.460	0.664
AT6	0.713	**0.796**	0.577	0.463	0.387	0.436	0.435	0.579	0.376	0.575
BI1	0.780	0.672	**0.850**	0.540	0.315	0.602	0.607	0.663	0.362	0.638
BI2	0.785	0.671	**0.837**	0.490	0.373	0.601	0.613	0.665	0.380	0.664

BI3	0.802	0.645	**0.865**	0.488	0.292	0.580	0.613	0.631	0.340	0.613
BI4	0.785	0.653	**0.860**	0.486	0.341	0.587	0.634	0.640	0.367	0.619
BI5	0.791	0.659	**0.860**	0.492	0.331	0.652	0.640	0.615	0.371	0.619
CM1	0.500	0.477	0.474	**0.827**	0.252	0.361	0.392	0.430	0.257	0.445
CM2	0.492	0.491	0.465	**0.835**	0.307	0.378	0.347	0.449	0.331	0.470
CM3	0.539	0.493	0.526	**0.844**	0.257	0.434	0.450	0.479	0.277	0.501
PC1	0.314	0.363	0.236	0.264	**0.725**	0.269	0.253	0.280	0.422	0.398
PC2	0.318	0.372	0.248	0.240	**0.749**	0.263	0.190	0.247	0.416	0.329
PC3	0.406	0.466	0.332	0.270	**0.833**	0.293	0.290	0.388	0.436	0.438
PC4	0.404	0.433	0.352	0.270	**0.834**	0.302	0.292	0.351	0.488	0.435
PC5	0.387	0.433	0.322	0.237	**0.775**	0.240	0.222	0.341	0.526	0.427
PEU1	0.519	0.472	0.531	0.395	0.227	**0.755**	0.565	0.452	0.250	0.420
PEU2	0.516	0.468	0.528	0.351	0.261	**0.735**	0.562	0.423	0.235	0.449
PEU3	0.498	0.416	0.510	0.283	0.230	**0.716**	0.556	0.340	0.238	0.363
PEU4	0.510	0.469	0.517	0.370	0.305	**0.757**	0.549	0.384	0.293	0.395
PEU5	0.422	0.330	0.477	0.281	0.239	**0.655**	0.501	0.380	0.150	0.356
PR1	0.481	0.423	0.498	0.331	0.208	0.552	**0.712**	0.397	0.261	0.387
PR2	0.561	0.478	0.566	0.357	0.238	0.556	**0.747**	0.428	0.285	0.463
PR3	0.464	0.397	0.477	0.330	0.255	0.542	**0.695**	0.340	0.237	0.379
PR4	0.539	0.469	0.546	0.331	0.238	0.540	**0.716**	0.404	0.295	0.409
PR5	0.462	0.390	0.504	0.344	0.207	0.504	**0.701**	0.370	0.264	0.406
PT1	0.608	0.570	0.620	0.467	0.321	0.473	0.466	**0.820**	0.227	0.579
PT2	0.601	0.592	0.571	0.479	0.371	0.453	0.423	**0.780**	0.258	0.577
PT3	0.614	0.572	0.630	0.480	0.351	0.451	0.485	**0.801**	0.258	0.595
PT4	0.612	0.537	0.641	0.422	0.296	0.457	0.465	**0.824**	0.239	0.556
PT5	0.576	0.553	0.569	0.334	0.345	0.370	0.349	**0.810**	0.218	0.501
PU1	0.377	0.405	0.311	0.264	0.404	0.250	0.287	0.202	**0.768**	0.350
PU2	0.392	0.457	0.366	0.255	0.477	0.262	0.294	0.243	**0.789**	0.388
PU3	0.364	0.407	0.327	0.284	0.425	0.188	0.286	0.237	**0.747**	0.377
PU4	0.360	0.437	0.294	0.297	0.462	0.258	0.277	0.196	**0.803**	0.391

PU5	0.400	0.464	0.355	0.247	0.499	0.307	0.320	0.274	**0.780**	0.418
RA1	0.608	0.613	0.581	0.430	0.446	0.451	0.473	0.570	0.364	**0.774**
RA2	0.627	0.634	0.594	0.433	0.426	0.410	0.445	0.542	0.402	**0.810**
RA3	0.558	0.589	0.554	0.384	0.362	0.435	0.422	0.487	0.421	**0.760**
RA4	0.597	0.608	0.562	0.447	0.376	0.431	0.439	0.547	0.354	**0.781**
RA5	0.545	0.536	0.538	0.427	0.367	0.429	0.453	0.541	0.361	**0.727**
RA6	0.586	0.582	0.582	0.495	0.421	0.385	0.423	0.534	0.390	**0.768**

The second is Fornell-Larcker Criterion and suggests that the square root of AVE in each latent variable can be used to establish discriminant validity, if this value is larger than other correlation values among the latent variables (Fornell & Larcker, 1981). The output obtained in this study for this test could be seen from Table 6 below.

Table 6: Construct Discriminant validity Fornell-Larcker Criterion

Construct	AMP	AT	BI	CM	PC	PEU	PR	PT	PU	RA
AMP	**0.907**									
AT	0.910	**0.798**								
BI	0.922	0.772	**0.855**							
CM	0.611	0.583	0.584	**0.836**						
PC	0.472	0.531	0.387	0.326	**0.785**					
PEU	0.677	0.607	0.693	0.467	0.340	**0.753**				
PR	0.695	0.599	0.719	0.463	0.303	0.711	**0.737**			
PT	0.746	0.699	0.753	0.542	0.416	0.533	0.543	**0.807**		
PU	0.488	0.560	0.426	0.346	0.585	0.337	0.375	0.297	**0.778**	
RA	0.763	0.772	0.738	0.565	0.520	0.541	0.566	0.696	0.496	**0.77**

Based on the above reliability and validity analysis made on indicators of each constructs, this study has reached a satisfactory level regarding reliability and validity.

5.3. Structural model and Hypothesis Test

Hypothesis testing in general context of PLS-SEM is usually conducted through the calculation of p-values for each path coefficient. The path coefficients indicate the strength of the relationship between factors: the further the value is from 0 (in absolute terms), the stronger the correlation (Hair et al., 2012). The scale is between -1 and 1: negative values indicate negative correlation while above zero signals positive correlation. In this study this path coefficient test is used to conduct the test of strength of the relationship between factors that $\beta \neq 0$, at the 0.05 significance level (i.e., 95%). If $p \leq 0.05$ (or alternatively absolute value of the t-value is less than 1.96) the hypothesis is accepted indicating significance of the finding at least with 95% level of confidence, otherwise it is not accepted. Both p-value and t-value justify the significance of relations: only relations possessing significant correlation should be taken in to account. This study sets a limit to significance at 5%, thus, only relations exceeding 1.96 in t-values (alternatively p-values of below or equal to 0.05) are considered significant (Hair et al., 2012).

Following the methods described in the proposed research model, a structural model for data analysis was created and tested with SmartPLS software. The model indicates the relationships between the variables, i.e. relationships present in the proposed research model. To determine statistical significance a complete bootstrapping was carried out in SmartPLS for collected sample data of 393. The bootstrap used 393 cases and 5000 subsamples after two indicators are excluded due to low outer loading factor (see Table 3 above). Values for the estimated path coefficients of variables, item loadings of each measurement items, and the coefficient of determination (R^2) of the other variable. All of the coefficients, except that of H5, are significant at the 5% significance level providing strong support for the hypothesized relationships. Based on the above parameter the results of model analysis are presented in Table 7 below.

Table 7: Structural Model fit Results

Hypothesis	Construct	R Squared	Path Coefficient	T Statistics	P Values	Status
H1	RA -> AT	0.693	0.473	8.62	0	**Accepted**
H2	CM -> AT		0.145	3.411	0.001	**Accepted**
H3	PEU -> AT		0.215	5.296	0	**Accepted**
H4	PU -> AT		0.203	5.218	0	**Accepted**
H5	PC -> BI	0.705	0.049	1.37	0.175	**Not accepted**
H6	PT -> BI		0.496	9.692	0	**Accepted**
H7	PR -> BI		0.435	8.695	0	**Accepted**
H8	AT -> AMP	0.947	0.49	34.906	0	**Accepted**
H9	BI -> AMP		0.543	40.026	0	**Accepted**

As indicated on Table 7 above, the adoption of customers to use m-payment was significantly impacted by attitude (p=0, or t=34.906) and behavioral intention (p=0, or t=40.026). These variables jointly explain 94.7% of the variance on AMP (R^2=0.947, coefficient of determination). As attitude towards adoption (AT) variable was impacted by relative advantage (p=0, or t=8.62), compatibility (p=0.001, or t=3.411), perceived ease of use (p=0, or t=5.296) and perceived usefulness (p=0, or t=5.218) with the coefficient determination of AT is 0.693 meaning RA, CM, PEAU and PU variables explain 69.3% of the variance. Whereas, behavioral intention (BI) variable was impacted by PT (p=0, or t=6.692) and PR (p=0, or t=8.695). The coefficient determination of BI is 0.705 meaning PT and PR variables explain 70.5% of the variance in BI. However, BI are not affected by PC in a statistically significant manner as the p-values (or t-values) indicated an insignificant relationship (p=0.175, or t=1.37). The fact that most of the variables had strong statistical relationships is an indication of the good explanatory power of the model for adoption of m-payment.

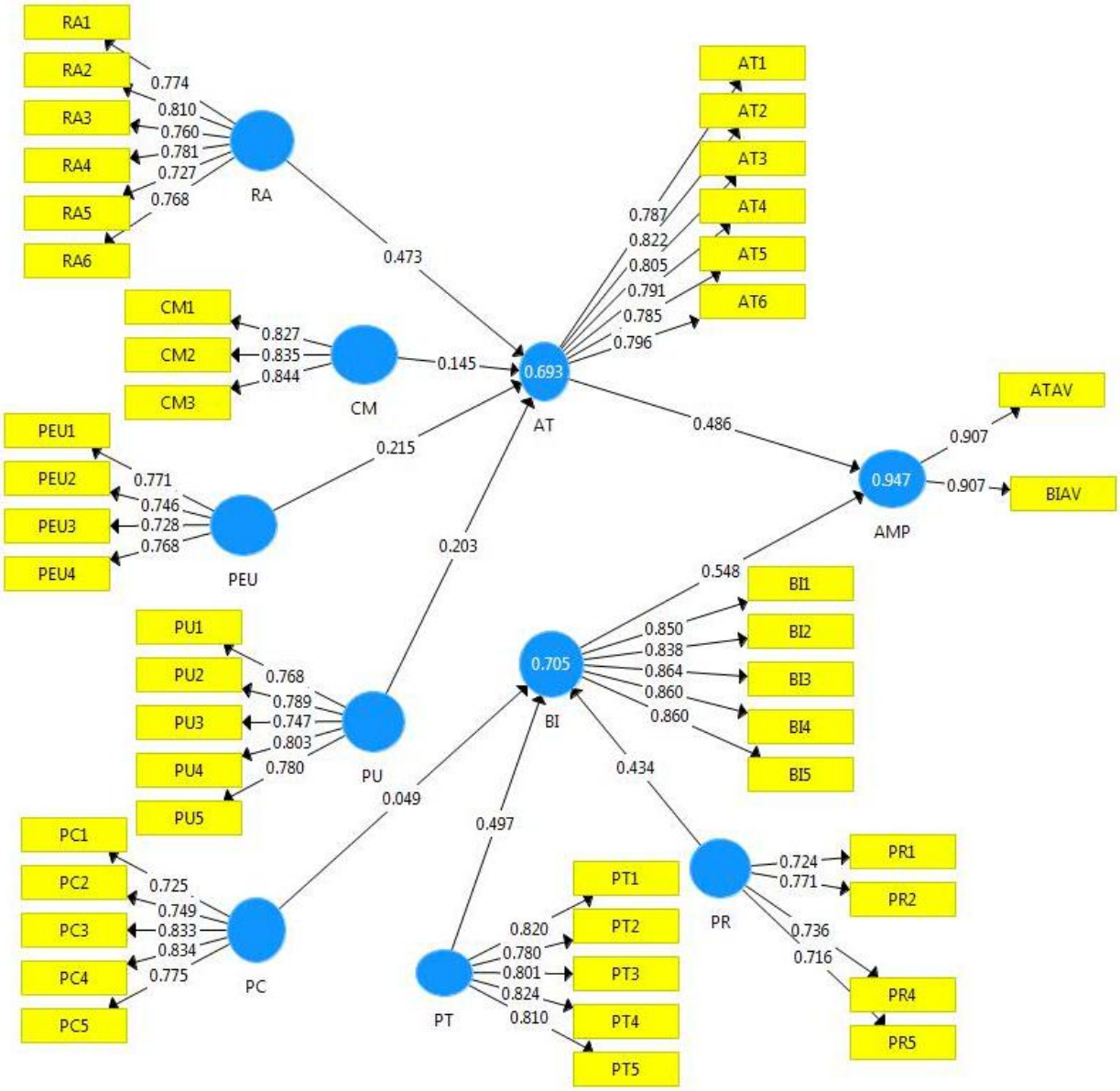

Figure 15: Structural Model

5.4. Discussion of Finding

Based on the analysis result, this section focuses on each variable relationship and their significance in affecting customers' adoption or use of m-payment. Furthermore, the discussion analyzes the statistical findings of the study in relation to the previous empirical evidences. The result for each set of factors is discussed as follows.

In figure 15 above, the structural model presents how much of the variable is explained by the underlying factors of m-payment adoption. In the inner variables attitude is modeled as a function of RA, CM, PEU and PU. These variables explained 69.3 percent of the variance in AT as the R^2 value or coefficient of determination stood at 0.693. This implies that 30.7 percent of the variance in AT is explained by other factors not included in the model. The other inner variable, behavioral intention, is modeled as a function of PC, PT and PR. These variables explained 70.5 percent of the variance in BI as the R^2 value or coefficient of determination stood at 0.705. This implies that 29.5 percent of the variance in AT is explained by other factors not included in the model. It is worth to mention here that though all the independent variables had coefficients significantly different from zero, PC was found to be insignificant.

5.4.1. The Relationship Between AT and the Independent Variables

In this research, attitude (AT) towards adoption of m-payment is modeled as a function of RA, CM, PEU and PU. RA is included to capture to what extent the new technology or product is perceived as better than the existing products. RA was hypothesized to have a significant positive effect on customers' attitude (H1). The empirical evidence of the study indicated that RA is the most powerful factor in affecting customers' attitude to adopt m-payment with a path coefficient of 0.473 and a p-value < 0.05 (or t-value >1.96), thereby supporting the Hypothesis H1. This aligns with the findings of (Kapoor, Dwivedi, & Williams, 2013). This suggests that customers acquire relative advantages from adoption of m-payments as the latter enables them purchase without time or place constraint, avoid queues, and improves their performance.

Therefore, H1 is accepted.

Compatibility indicates the degree which the technology service is perceived as consistent with socio cultural values and beliefs; with previous and present idea; and with client needs of innovation (Rogers, 1995). CM was hypothesized to have a significant positive effect on customers' attitude (H2). The empirical evidence of the study indicated that CM is the fourth powerful factor in affecting customers' attitude to adopt m-payment with a path coefficient of 0.145 and a p-value < 0.05 (or t-value >1.96), thereby supporting the Hypothesis H2. This aligns with the findings of (Kapoor et al., 2013; Oliveira, Thomas, Baptista, & Campos, 2017; Zhong,

Dhir, Nieminen, Hämäläinen, & Laine, 2013). This suggests m-payments are compatible with life style, current situation and way of purchase of customers.

Therefore, H2 is accepted.

Perceived ease of use is defined as the degree to which a person believes that using a particular system would be free from difficulty that is, utilizing a specific technology (like mobile payment) would be free of physical and mental exertion (Davis, 1989). PEU was hypothesized to have a significant positive effect on customers' attitude (H3). The empirical evidence of the study indicated that PEU is the second powerful factor in affecting customers' attitude to adopt m-payment with a path coefficient of 0.215 and a p-value < 0.05 (or t-value >1.96), thereby supporting the Hypothesis H3. This aligns with the findings of (Pal, Vanijja, & Papasratorn, 2015; Zhong et al., 2013). This suggests that customers perceive that m-payments are easy to learn and use.

Therefore, H3 is accepted.

Perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). PU was hypothesized to have a significant positive effect on customers' attitude (H4). The empirical evidence of the study indicated that PEU is the third powerful factor in affecting customers' attitude to adopt m-payment with a path coefficient of 0.203 and a p-value < 0.05 (or t-value >1.96), thereby supporting the Hypothesis H4. This aligns with the findings of (Pal et al., 2015; Zhong et al., 2013). This suggests that customers perceive that m-payments are useful.

Therefore, H4 is accepted.

5.4.2. The Relationship between BI and the Independent Variables

In this research, behavioral intention (BI) towards adoption of m-payment is modeled as a function of PC, PT and PR. PC is the perceived expenditure in the actual customer consumption process. It is the sum of costs including time, money, physical strength, energy, psychology and other costs for the customers in the consumption process of the products or services. Customer perceived cost refers to product or service price which the customer actually paid (Zhihong,Wang Haomin, 2016). PC was hypothesized to have a significant positive effect on

customers' behavioral intention (H5). The empirical evidence of the study does not indicate that PC affects customers' behavioral intention to adopt m-payment with a path coefficient of 0.049 and a p-value > 0.05 (or t-value <1.96). Even if the coefficient has positive sign, it is not significantly different from zero. Thus, failing to support the Hypothesis H5. This suggests that the effect of customers' perceived cost on their behavioral intention to adopt m-payments is not statistically significant.

Therefore, H5 is not accepted.

Due to inherent nature of mobile payments, trust is believed to influence directly or indirectly the intention of adoption and acceptance of mobile payments because mobile services are exposed to various uncertainties and uncontrollable consequences (Anthony & Mutalemwa, 2014). PT indicates the degree which the technology service is perceived as trusted by consumers. PT was hypothesized to have a significant positive effect on customers' behavioral intention (H6). The empirical evidence of the study indicated that PM is the most powerful factor in affecting customers' behavioral intention to adopt m-payment with a path coefficient of 0.496 and a p-value < 0.05 (or t-value >1.96), thereby supporting the Hypothesis H6. This aligns with the findings of (Yan & Pan, 2015). This suggests m-payments are perceived as trustworthy, reliable and secured by customers.

Therefore, H6 is accepted.

Perceived risk in consumer adoption intention of financial technology has three important dimensions: security, privacy and monetary. Perceived privacy risk defined the possibility that inline businesses might use personal information inappropriately invading consumer's privacy with m-payment consumers authorize retailer to use their personal information and gain access to their bank account (Nyshadham, 2000; Thakur & Srivastava, 2014). PR was hypothesized to have a significant positive effect on customers' behavioral intention (H7). The empirical evidence of the study indicated that PR is the second powerful factor in affecting customers' attitude to adopt m-payment with a path coefficient of 0.435 and a p-value < 0.05 (or t-value >1.96), thereby supporting the Hypothesis H7. This aligns with the findings of (Baganzi & Lau, 2017; Yang et al., 2015). This suggests that customers perceive that m-payments have low risk.

Therefore, H7 is accepted.

5.4.3. The Relationship between AMP and the Independent Variables

In this research, adoption of m-payments (AMP) is modeled as a function of AT and BI. AT, in turn, is measured by RA, CM, PEU and PU. Whereas, BI is measured by PC, PT and PR. AT was hypothesized to have a significant positive effect on customers' adoption of m-payments (H8). The empirical evidence of the study indicated that AT is the second powerful factor in affecting customers' adoption of m-payment with a path coefficient of 0.49 and a p-value > 0.05 (or t-value <1.96), thereby supporting the Hypothesis H8. This suggests that the effect of customers' attitude to adopt m-payments is statistically significant.

Therefore, H8 is accepted.

Behavioral intention was hypothesized to have a significant positive effect on customers' adoption of m-payments (H9). The empirical evidence of the study indicated that BI is the most powerful factor in affecting customers' adoption of m-payment with a path coefficient of 0.543 and a p-value > 0.05 (or t-value <1.96), thereby supporting the Hypothesis H9. This suggests that the effect of customers' behavioral to adopt m-payments is statistically significant.

Therefore, H9 is accepted.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

This chapter presents the conclusions drawn from the findings, recommendations forwarded and future works suggested.

6.1. Conclusion

This study is aimed at exploring factors that affect customers' mobile payment adoption in Ethiopia, with specific clients of Commercial Bank of Ethiopia, Dashen Bank and MBirr. Therefore, the study is aimed at answering the question: What are the factors affecting the customer's usage of mobile payment in Ethiopia?

To answer the above research question, the study mainly focused on the effect of the following factors or constructs on customers' adoption of m-payments: relative advantage, compatibility, perceived ease of use, perceived usefulness, perceived cost, perceived trust, perceived risk, attitude and behavioral intention of m-payment service.

In this research, the key factors affecting customers' adoption of m-payments have been examined using the proposed research model developed for this research basing DOI, TAM & Extended TAM. This study was conducted based on the data gathered from customers of Commercial Bank of Ethiopia, Dashen Bank and MBirr in Addis Ababa, Ethiopia. Survey was conducted using self-administered questionnaire. Out of 400 questionnaires that have been distributed to customers, 393 valid questionnaires were collected and used for data analysis. The proposed model was tested using a partial least square with the help of the SmartPLS software version 3.0 as well as SPSS version 23.

The structural model presents how much of the variable is explained by the underlying factors of m-payment adoption. In the inner variables attitude is modeled as a function of RA, CM, PEU and PU. These variables explained 69.3 percent of the variance in AT as the R^2 value or coefficient of determination stood at 0.693. This implies that 30.7 percent of the variance in AT is explained by other factors not included in the model. RA, PEU, PU and CM are found to be positively and significantly affecting customers' attitude to adopt m-payment.

The other inner variable, behavioral intention, is modeled as a function of PC, PT and PR. These variables explained 70.5 percent of the variance in BI as the R^2 value or coefficient of determination stood at 0.705. This implies that 29.5 percent of the variance in AT is explained by other factors not included in the model. PT and PR are found to be positively and significantly affecting customers' behavioral intention to adopt m-payment. On the other hand, PC was found to be positively but insignificantly affecting customers' behavioral intention to adopt m-payment. Finally, m-payment adoption is modeled as a function of the average values of attitude and behavioral intention. Results of the model of adoption of m-payment indicated that the two variables have accounted for 94.7% of the variance in m-payment adoption (R^2 value, coefficient of determination of 0.947). This implied that the remaining 5.3% variance in m-payment adoption are caused by other factors not included in the model. AT and BI are found to be positively and significantly affecting customers' adoption of m-payment.

6.2. Recommendation

Based on the findings of the research, the following recommendations are forwarded to improve m-payment adoption by customers:

- The study indicated that relative advantage has a very high and positive impact on customers' attitude towards the adoption of m-payments. Therefore, m-payment service providers are advised to work on enhancing the awareness of customers about the relative advantage of the services. This could be achieved by increased advertising initiatives about the services.
- Based on the findings, compatibility is a key factor affecting customers' attitude towards the adoption of m-payments. Thus, m-payment service providers must work on ensuring that m-payment services are compatible with life style, socio-cultural and purchasing behavior of customers.
- The study found that perceived ease of use is another key factor affecting customers' attitude towards the adoption of m-payments. Ease of use could be improved by modernizing the m-payment technology.
- The study found that perceived usefulness is another key factor affecting customers' attitude towards the adoption of m-payments. Usefulness could be enhanced by expanding the coverage of the service and interfacing same with different stakeholders.

- ❖ Based on the findings, perceived trust is a key factor affecting customers' behavioral intention to adopt m-payments. Thus, m-payment service providers must work on enhancing the security, reliability and privacy of m-payment services.
- ❖ Finally, based on the findings, perceived risk is a key factor affecting customers' behavioral intention to adopt m-payments. Thus, m-payment service providers must work on making the m-payment system free of any transaction errors.

6.3. Future Work

This research conducted to explore factors of m-payment systems adoptions which can be a key to the financial sector and the benefit of integrating it with the existing financial system. As such, there are still rooms for further investigation into the adoption of m-payment service. The following are areas that could be considered for future research:

- ✓ The contribution of demographic factors such as knowledge or educational background toward moderating the effect of the mentioned independent variables to the adoption of m-payment was not given much emphasis in this study; future researchers may investigate the influence of moderating factors.
- ✓ This research was conducted in Addis Ababa, Ethiopia. Further studies may also consider selecting respondents from other areas outside of Addis Ababa, as well as incorporating additional social and cultural beliefs in understanding the affecting factors to adopt m-payment.

Reference

Ajzen, I. (1991). The Theory of Planned Behavior. *Organization Behavior and Human Decision Processes, Academic Press, Inc.*, 179–211.

Ajzen, I., & Fishbein, M. (1977). Attitude-Behavior Relations : A Theoretical Analysis and Review of Empirical Research, *84 No. 5*(June), 888–918.

Anthony, D., & Mutalemwa, D. K. (2014). Factors influencing the use of mobile payments in Tanzania: Insights from Zantel's z-pesa services. *The Journal of Language, Technology & Entrepreneurship in Africa (JOLTE), 5*(2), 69–90.

Anyasi, F. I., & Otubu, P. A. (2009). Mobile Phone Technology in Banking System: Its Economic Effect. *Research Journal of Information Technology*, *1*(ISSN:2041-3114), 1–5.

Aydin, G. (2016). Adoption of mobile payment systems: a study on mobile wallets. *Pressacademia*, *5*(1), 73–73. https://doi.org/10.17261/Pressacademia.2016116555

Baganzi, R., & Lau, A. K. W. (2017). Examining Trust and Risk in Mobile Money Acceptance in Uganda. *Sustainability (Switzerland)*. https://doi.org/10.3390/su9122233

Bash, E., Smart Card Alliance, Amin, H., Dutot, V., Koenig-Lewis, N., Marquet, M., … Shin, D.-H. (2015). the Adoption Intention of Near Field Communication (Nfc) - Enabled Mobile Payment Among Consumers in Malaysia. *Emerald Insight*, *26*(1), 319–340. https://doi.org/10.1017/CBO9781107415324.004

Bearing Point. (2012). Mobile Money – The future of the payments market. Retrieved from www.bearingpoint.com

Blair, E. (2015). Ethiopia launches mobile money schemes to extend banking reach. Retrieved from https://www.reuters.com/article/ethiopia-banking/ethiopia-launches-mobile-money-schemes-to-extend-banking-reach-idUSL6N0VE44020150204

Chaix, L., & Torre, D. (2011). Four models for mobile payments. *University Nice Sophia-Antipolis*, (February), 1–18.

Chaix, L., & Torre, D. (2015). The Dual Role of Mobile Payment in Developing Countries.

Revue Economique, *66*(4), 703–727. Retrieved from https://www.scopus.com/inward/record.uri?eid=2-s2.0-84937799975&partnerID=40&md5=27185e6c48f0b0c29ccf3ffbf2bf3e0f

Chen, J. J., Adams, C., & Introduction, I. (2005). User Acceptance of Mobile Payments: A Theoretical Model for Mobile Payments. *Proceedings of the Fifht International Conference*, 5–9.

Chou, Y., Lee, C., & Chung, J. (2004). Understanding m-commerce payment systems through the analytic hierarchy process. *Journal of Business Research*, *57*(12 SPEC.ISS.), 1423–1430. https://doi.org/10.1016/S0148-2963(02)00432-0

Chuttur, M. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. *Sprouts Working Papers on Information Systems*, *9*(37), 9–37.

Cobanoglu, C., Yang, W., Shatskikh, A., & Agarwal, A. (2015). Are Consumers Ready for Mobile Payment? An Examination of Consumer Acceptance of Mobile Payment Technology in Restaurant Industry. *Hospitality Review*, *31*(4).

Dahlberg, T., Mallat, N., & Ondrus, J. (2014). Mobile Payment Market and Research – Past, Present and Future. *Journal of International Development*, *2*(3), 45–49.

Dahlberg, T., Mallat, N., & Öörni, A. (2003). Trust enhanced technology acceptance model - consumer acceptance of mobile payment solutions. *Stockholm Mobility Roundtable*, (January), 22–23.

Daştan, İ., & Gürler, C. (2016). Factors Affecting the Adoption of Mobile Payment Systems: An Empirical Analysis. *EMAJ: Emerging Markets Journal*, *6*(1), 17–24. https://doi.org/10.5195/EMAJ.2016.95

David, G. (2016). *PARTIAL LEAST SQUARE S (PLS - SEM) - Regression and Structural Equation Models*.

Davis, F. D. (1989). Perceived Usefulness , Perceived Ease of Use , and User Acceptance of Information Technology, (October).

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer

Technology: A Comparison of Two Theoretical Models. *Management Science*, *35*(8), 982–1003.

De Kerviler, G., Demoulin, N. T. M., & Zidda, P. (2016). Adoption of in-store mobile payment: Are perceived risk and convenience the only drivers? *Journal of Retailing and Consumer Services*, *31*, 334–344. https://doi.org/10.1016/j.jretconser.2016.04.011

Demirguc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *Senoh 2006_Elytra Vol 34 No 2 2006 Senoh Tryzna.pdf*. https://doi.org/10.1596/978-1-4648-1259-0

Dennehy, D., & Sammon, D. (2015). Trends in mobile payments research: A literature review. *Journal of Innovation Management*, *3*(1), 49–61. Retrieved from http://www.open-jim.org/article/view/71/72

Donovan, K. P. (2012). Mobile Money, More Freedom? The Impact of M-PESA's Network Power on Development as Freedom. *International Journal of Communication*, *6*(0), 23.

Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. *International Journal of Human Computer Studies*, *59*(4), 451–474. https://doi.org/10.1016/S1071-5819(03)00111-3

Fishbein, M. (1979). A theory of reasoned action: some applications and implications.

Fishbein, M., & Ajzen, I. (1975). Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research, (c), 1–4. https://doi.org/10.15713/ins.mmj.3

Flood, D., West, T., & Wheadon, D. (2013). Trends in Mobile Payments in Developing and Advanced Economies. *RBA Bulletin*, 71–80. Retrieved from http://www-ho.rba.gov.au/publications/bulletin/2013/mar/pdf/bu-0313-8.pdf

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models With Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(No. 1), 39–50. Retrieved from http://www.dt.co.kr/contents.html?article_no=2012071302010531749001

Gaur, A., & Ondrus, J. (2012). The role of banks in the mobile payment ecosystem. *Proceedings of the 14th Annual International Conference on Electronic Commerce - ICEC '12*, 171–177. https://doi.org/10.1007/BF03045972

Gefen, D., & Boudreau, M.-C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4*(October). https://doi.org/10.17705/1CAIS.00407

Ghauri, P., & Gronhaug, K. (2005). Research Methods in Business Studies. Harlow, FT/Prentice Hall.

Ghazizadeh, S. (2012). Acceptance Theory on Mobile Services and Applications. *University of Applied Sciences*, 1–53.

Glocker, T. (2012). Partial Least Squares Path Modeling : Introduction and Application, 2–5.

Guo, J., & Bouwman, H. (2016). An Analytical Framework for an M - payment Ecosystem : a Merchants ' Perspective. *Telecommunications Policy*, *40(2-3)*, 147–167. https://doi.org/10.1016/j.telpol.2015.09.008

Gupta, S. (2013). The Mobile Banking and Payment Revolution. *European Financial Review*, 3–6. Retrieved from http://consortio-services.com/wp-content/uploads/2013/10/The-Mobile-Banking-and-Payment-Revolution.pdf

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414–433. https://doi.org/10.1007/s11747-011-0261-6

Hayashi, F. (2012). Mobile payments: What's in it for consumers? *Kansascityfed.Org*, 35–66. Retrieved from http://www.kansascityfed.org/OkTWO/ieSWo/nVSUd/nNjOo/publicat/econrev/pdf/12q1Hayashi.pdf

Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence Based Nursing*, *18*(3), 66–67. https://doi.org/10.1136/eb-2015-102129

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hoofnagle, C. J., Urban, J. M., & Li, S. (2012). Mobile Payments: Consumer Benefits & New

Privacy Concerns. *Ssrn*. https://doi.org/10.2139/ssrn.2045580

IFSF. (2014). ISO 12812 First International Standard for Mobile Payments. *IFSF Technical Conference*.

Israel, G. (1992). Determinig sample size, (November), 1–5. https://doi.org/10.4039/Ent85108-3

Kai-ming au, A., & Enderwick, P. (2000). A cognitive model on attitude towards technology adoption. *Journal of Managerial Psychology*, *15*(4), 266–282. https://doi.org/10.1108/02683940010330957

Kapoor, K., Dwivedi, Y. K., & Williams, M. D. (2013). Role of innovation attributes in explaining the adoption intention for the interbank mobile payment service in an Indian context. *IFIP Advances in Information and Communication Technology*, *402*(2012), 203–220. https://doi.org/10.1007/978-3-642-38862-0_13

Karthikeyan, S. (2012). Mobile payments: A comparative study between european and non-european markets. *School of Information and Communication Technology*, *35*. https://doi.org/10.1109/MC.2002.1106185

Kim, Y. J., Chun, J. U., & Song, J. (2009). Investigating the role of attitude in technology acceptance from an attitude strength perspective. *International Journal of Information Management*, *29*(1), 67–77. https://doi.org/10.1016/j.ijinfomgt.2008.01.011

Kwong-Kay Wong, K. (2013). Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS. *Marketing Bulletin*, *24*, 1–32. https://doi.org/10.1097/MNM.0b013e328332f801

Lai and Zainal, A. A. (2015). Consumers Intention to Use a Single Platform E-Payment System: A Study Among Malaysian Internet and Mobile Banking Users. *Journal of Internet Banking and Commerce*, *(20)(1)*(February), 1–13.

Lai, P. (2017). the Literature Review of Technology Adoption Models and Theories for the Novelty Technology. *Journal of Information Systems and Technology Management*, *14*(1), 21–38. https://doi.org/10.4301/S1807-17752017000100002

Lai, P. M. (2010). Developing an Analytical Framework for Mobile Payments Adoption in

Retailing : A Supply-Side Perspective. https://doi.org/10.1109/ICMeCG.2010.79

Larsen, H. O., & Davide, P. (2006). Research synopsis writing, 1–2. https://doi.org/10.13140/RG.2.1.3478.3840

Mallat, N. (2006). Exploring consumer adoption of mobile payments–A qualitative study. *The Journal of Strategic Information Systems*, 1–14. https://doi.org/10.1016/j.jsis.2007.08.001

Maradung, P. (2013). Factors affecting the adoption of mobile money services in the banking and financial industries of Botswana. *Journal of Internet Baanking and Commerce*, (October), 1–72.

Muya, C. (2016). Mobile money in Africa Mobile money in Africa, (March), 1–15.

National Bank of Ethiopia. (2018). Payment Channels and Instruments. unpublished internal document.

Nazari, F., Khosravi, F., & Babalhavaeji, F. (2013). Applying Rogers' diffusion of innovation theory to the acceptance of online databases at university zone of Iran. *Malaysian Journal of Library and Information Science*, *18*(3), 25–38.

Nurhussen, N. (2016). HiLCoE HiLCoE.

Nyshadham, E. A. (2000). Consumer perceptions of online transaction security – A cognitive explanation of the origins of perception. *Proceedings of the American Conference on Information Systems*, 837–842.

Oliveira, T., Thomas, M., Baptista, G., & Campos, F. (2017). Computers in Human Behavior Mobile payment : Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, *61*(2016), 404–414. https://doi.org/10.1016/j.chb.2016.03.030

ÖRS, M. E. (2018). DEVELOPMENT OF A TECHNOLOGY ACCEPTANCE MODEL FOR MOBILE PAYMENT SYSTEMS, (May).

Pal, D., Vanijja, V., & Papasratorn, B. (2015). An Empirical Analysis towards the Adoption of NFC Mobile Payment System by the End User. *Procedia Computer Science*, *69*, 13–25. https://doi.org/10.1016/j.procs.2015.10.002

Pidugu, K. (2015). Mobile payment adoption in South Africa: merchant's perspective, (14449316).

Pousttchi, K., Wiedemann, D. G., & Wiedeman, D. G. (2007). What Influences Consumers' Intention to Use Mobile Payments? *LA Global Mobility Round Table*, (June), 1–16. Retrieved from http://www.marshall.usc.edu/assets/025/7534.pdf%5Cnhttp://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.86.8935&rep=rep1&type=pdf

Raina, V. K. (2014). *Overview of Mobile Payment*. *Banking, Finance, and Accounting*. https://doi.org/10.4018/978-1-4666-6268-1.ch011

Rogers, E. M. (1995). *Diffusion of innovations*. *Macmillian Publishing Co.* https://doi.org/citeulike-article-id:126680

Sherferahu, T. S., & Gezu, G. (2016). Challenges and Opportunities of E-payment in Ethiopia Banking Industry : With the reference of private commercial banks. *International Journal of Scientific and Research Publications*, *6*(8), 502–509.

Shih, Y., & Fang, K. (2004). The use of a decomposed theory of planned behavior to study Internet banking in Taiwan, *14*(3), 213–223. https://doi.org/10.1108/10662240410542643

Straub, D., Gefen, D., & Boudreau, M.-C. (2004). Validation Guidelines for IS Positivist Research. *Communications of the Association for Information Systems*, *13*(March), 380–427. https://doi.org/10.17705/1CAIS.01324

Taherdoost, H. (2016). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *International Journal of Academic Research in Management (IJARM)*, *5*, *No.3*(January 2016), 28–36. https://doi.org/10.2139/ssrn.3205040

Thakur, R., & Srivastava, M. (2014). Adoption readiness, personal innovativeness, perceived risk and usage intention across customer groups for mobile payment services in India. *Internet Research*. https://doi.org/10.1108/IntR-12-2012-0244

Ting, H., Yacob, Y., Liew, L., & Ming, W. (2016). Intention to Use Mobile Payment System : A

Case of Developing Market by Ethnicity. *Procedia - Social and Behavioral Sciences*, *224*(August 2015), 368–375. https://doi.org/10.1016/j.sbspro.2016.05.390

Tobbin, P. (2011). Understanding the mobile money ecosystem: Roles, structure and strategies. *Proceedings - 2011 10th International Conference on Mobile Business, ICMB 2011*, (July 2011), 185–194. https://doi.org/10.1109/ICMB.2011.19

Trafimow, D. (2015). A Case Study of Falsification in Psychology, (August 2009). https://doi.org/10.1177/0959354309336319

Tsemane, A. (2015). The Impact of Mobile Money on Financial Inclusion in Lesotho, (November), 1–103.

Venkatesh, V., & Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Journal of Theoretical and Applied Information Technology*, *83*(1), 119–137. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., James Y.L., T., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology, *36*(1), 157–178.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View, *27*(3), 425–478.

Venkatesh, V., Ramesh, V., & Anne, P. M. (2003). Understanding Usability in Mobile Commerce. *Communications of the ACM*, *46*(12), 53–56.

White Paper. (2011). Mobile Payments: Risk, Security and Assurance Issues. *ISACA*, *15*. https://doi.org/10.1016/j.cose.2004.11.001

White Paper. (2012). Mobile Money – The future of the payments market. Retrieved from www.bearingpoint.com

Winn, J. K., & Koker, L. De. (2013). Introduction To Mobile Money in Developing Countries: Financial Inclusion and Financial Integrity Conference Special Issue. *Washington Journal of Law, Technology & Arts*, *8*(3), 156–164. https://doi.org/10.1525/sp.2007.54.1.23.

Woldemariam, M., Atnafu, S., Gronli, T.-M., & Ghinea, G. (2011). Mobile Money System

Design for Illiterate Users in Rural Ethiopia, *8519*, 1. https://doi.org/10.1007/978-3-319-07635-5

Wondwossen, T., & Tsegai, G. (2005). "E-payment: challenges and opportunities in Ethiopia"¶ . *Economic Commission for Africa*, (October), 1–59.

Yan, H., & Pan, K. (2015). Examining mobile payment user adoption from the perspective of trust transfer. *International Journal of Networking and Virtual Organisations*, *15*(2/3), 136. https://doi.org/10.1504/IJNVO.2015.070423

Yang, Y., Liu, Y., Li, H., & Yu, B. (2015). Understanding perceived risks in mobile payment acceptance. *Industrial Management and Data Systems*. https://doi.org/10.1108/IMDS-08-2014-0243

Yin, R. K. (2014). How to know whether and when to use the case study as a reserach method.

Zhihong,Wang Haomin, L. (2016). Factors Influencing Usage of Third Party Mobile Payment Services in China : An Empirical Study.

Zhong, J., Dhir, A., Nieminen, M., Hämäläinen, M., & Laine, J. (2013). Exploring Consumer Adoption of Mobile Payments in China. *Proceedings of International Conference on Making Sense of Converging Media - AcademicMindTrek '13*, (August 2015), 318–325. https://doi.org/10.1145/2523429.2523483

Appendix

Appendix A

Section A: Demographic Profile

In this section, I would like you to fill in some of your personal details. Please tick your answer with (√) and your answers will be kept confidential.

1: Gender: ☐ Female ☐ Male

2: Age:

☐ 20 years or less ☐ 21 to 30 years

☐ 31 to 40 year's ☐ 41 years and above

3: Educational background

☐ Primary School ☐ Secondary School

☐ Degree ☐ Master Degree or above

4: Mobile Payment Provider using:

☐ CBE Birr- CBE ☐ Amole- Dashen Bank

☐ MBirr

Section B: Mobile payment adoption factors

This section is seeking your opinion regarding factors affecting consumers to the adoption of mobile payment. Respondents are asked to indicate the extent to which they agree or disagree with each statement using five-point Likert scale **[(1) = strongly disagree; (2) = disagree; (3) = neutral; (4) = agree and (5) = strongly agree**] response framework. Please select your choice by putting tick sign (√) per line to indicate the extent to which you agree or disagree with the following statements

1. The following items are intended to measure the extent to which **Relative Advantage (RA)** can affect consumers attitude towards the adoption of mobile payment

Item	**Relative Advantage Construct Measures**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
RA1	Mobile payment enables me to purchase at any time and from wherever I am					
RA2	Mobile payment helps me in queue avoidance					
RA3	Mobile payment enhances payment instrument availability					
RA4	Mobile payment supplements cash					
RA5	Using mobile payment increases my productivity.					
RA6	Using mobile payment improves my performance.					

2. The following items are intended to measure the extent to which **Compatibility (CM)** can affect consumers attitude towards the adoption of mobile payment

Item	Compatibility Construct Measures	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
CM1	Using mobile payment is compatible with all aspects of my life style.					
CM2	Using mobile payment is completely compatible with my current situation.					
CM3	Using mobile payment fits well with the way I like to buy.					

3. The following items are intended to measure the extent to which **Complexity or Perceived ease of use (PEU)** can affect consumers attitude towards the adoption of mobile payment

Item	Complexity or Perceived ease of use Construct Measures	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
PEU1	It's easy for me to learn to use mobile payment					
PEU2	I find mobile payment easy to use					
PEU3	It's easy for me to use mobile payments competently (use shortcuts or advanced options)					
PEU4	My interaction with mobile payment is clear and straightforward.					
PEU5	It's easy to get the information I want from mobile payments					

4. The following items are intended to measure the extent to which **Perceived Usefulness (PU)** can affect consumers attitude towards the adoption of mobile payment

Item	**Perceived Usefulness Construct Measures**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
PU1	Using mobile payment would take less time and effort than using traditional payment methods					
PU2	Mobile payment makes it easier for me to buy products or services					
PU3	Mobile payment increases my savings during my purchases.					
PU4	I make better decisions when buying with mobile payment systems					
PU5	Mobile payment is useful for me to buy products or services.					

5. The following items are intended to measure the extent to which **Perceived Cost (PC)** can affect consumers behavioral intention towards the adoption of mobile payment

Item	**Perceived Cost Construct Measures**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
PC1	Mobile payment is cost effective					
PC2	Using mobile payment systems does not create additional costs					
PC3	With current costs, mobile payment provides good value					

PC4	Mobile payment provides me premium pricing & low transaction costs					
PC5	Mobile payment is reasonably priced.					

6. The following items are intended to measure the extent to which **Perceived Trust (PT)** can affect consumers behavioral intention towards the adoption of mobile payment

Item	**Perceived Trust Construct Measures**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
PT1	The mobile payment service provider is trustworthy					
PT2	I believe mobile payment service is reliable					
PT3	Mobile payment systems are safe for me					
PT4	Mobile payment is a safe place to send sensitive information					
PT5	I feel secure sending sensitive information across mobile payment.					

7. The following items are intended to measure the extent to which **Perceived Risks (PR)** can affect consumers behavioral intention towards the adoption of mobile payment

Item	**Perceived Risk Construct Measures**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
PR1	The risk of interference with unauthorized parties in the mobile payment process is low					
PR2	Mobile payment systems give me confidence					

PR3	I have no concern about device and network reliability when using mobile payment					
PR4	I have no privacy concerns regarding mobile payments					
PR5	Mobile payment doesn't lead me to transaction error, lack of transaction record and documentation like receipt advice					

8. The following items are intended to measure factors affecting customers' Attitude toward the usage/adoption of mobile payment

Item	**Attitude Construct Measures**	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
AT1	I can use mobile payment services without detailed instructions					
AT2	I'm confident in buying products using mobile payment					
AT3	In general, I am competent in the use of mobile payment systems					
AT4	Using mobile payment is fun.					
AT5	Using mobile payment is very entertaining.					
AT6	Using mobile payment is enjoyable.					

9. The following items are intended to measure factors affecting customers' Behavioral intention to adopt mobile payment

Item	Behavioral Intention Construct Measures	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
BI1	I intend to use mobile payment in the future.					
BI2	I plan to use mobile payment in the next months.					
BI3	I will try to use mobile payment in my daily life.					
BI4	Interacting with my financial account over mobile payment is something that I would do.					
BI5	I would not hesitate to provide personal information to mobile payment service.					

Thank you for your unreserved cooperation

---------//--------

DECLARATION

I hereby declare that the thesis entitled ***Factors Affecting Mobile Payment Adoption in Ethiopia: A Consumer Perspective*** is my own work and all sources of materials used for the study has been duly acknowledged. It has not been submitted before for any degree or examination in any university.

_____	_____	_____
Name	**Signature**	**Date**

This thesis has been submitted for examination with my approval as university advisor.

_____	_____	_____
Advisor's Name	**Signature**	**Date**