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Examining Challenges Impacting Mobile Money Penetration Levels in Somalia: The case of ZAAD in Mogadishu

A dissertation submitted in partial fulfilment of the requirements of the Royal Docks School of Business and Law, University of East London for the degree of **Msc International Business Management**

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Title: Examining Challenges Impacting Mobile Money Penetration Levels in Somalia: The case of ZAAD in Mogadishu

Abstract

The study is intended to examine the challenges that impact on Mobile Money Services (MMS) penetration in the outskirts of the Somali Capital City, Mogadishu. The study presumes that there are challenges and limitations, which influence the adoption and use of MMS technology ensuing onto low levels of penetration. This research is significant because Somalia has been undergoing a civil war for many years, there are few banks and majority of the population relies on MMS.

The study is guided by three explicit objectives that entail understanding what influences customer adoption of MMS in Mogadishu; To identify how user acceptance of mobile money applications affect their penetration levels in Mogadishu and to examine the impact of external factors such as environmental and technological on MMS penetration in Mogadishu

Evincing from the Technology Acceptance Model (TAM) and relying on a case study of ZAAD in a mixed methods approach, the study finds that levels of MMS penetration have a significant correlation with perceived ease of use with of 1.11 at 5% significant levels. In addition, levels of MMS penetration have a statistically significant correlation with perceived trust at 5% and with environmental factors at 0.67 with 1% level of significance. Conversely, the study finds that technological factors do not have an impact on levels of penetration.

Contents

1.0 CHAPTER ONE

1.1 INTRODUCTION

1.1.1 Background

There is an increase in mobile payment platforms that are helping the poor to access financial services in sub-Saharan Africa (Otieno et al, 2016; Nyaga and Ogollah, 2015). However this has led to the most frequently asked question why have they not penetrated all areas evenly? This question is posed because only 34% of sub-Saharan African population does have access to bank accounts in financial institutions (World Bank, 2016). In addition, the sub-Saharan African populations need mobile money services most as they mainly live in rural areas that do not have banks (World Bank, 2016). These would assist people by enabling them to transfer money, make payments and use other financial services (Donavan, 2012).

The growing rise of mobile phone use worldwide is a result of increased customer's technological levels (Mahatanankoon et al. 2005; Merrit 2010; Hinson 2010; Boateng, 2011, Jack & Suri, 2011; Mbiti & Weil, 2011). Basing on the International Telecommunication Union (ITU), mobile telephone users presently make 5.9 billion, the worldwide penetration reaches a staggering 87% overall and 79% in the low income countries (ITU, 2011a). At the end of the year 2008, African continent had 246 million users, and mobile transmission had increased from just 5% in 2003 to thriving over 30% in the year 2008 (Dogbevi, 2010).

The ubiquitous nature of mobile phone technology as well as its usages offers it as a vital developmental instrument to address social issues and promote the increase of basic services among the developing economies (Tiwari et al., 2006). One of the problems is accessibility to financial services in the emerging economies. According to Beshouri and Gravraak (2010) the entire number of individuals with a mobile telephone, but with no

accessibility to banking financial services would be 1.7 billion by the end of the year 2012. According to World Bank (2012), internationally, more than 2.5 billion adult persons have no an official bank account and the majority are in the emerging economies. Merely 41% of the adult persons in the emerging countries formally have an account in a bank. In Africa, simply 20% of households have accounts in banks. Most of such people are in the rural areas in the low income countries. The reasons why they do not have a bank account are because they have no money or funds to use on the account. In addition, formal bank accounts are also very costly, characterized with long distance to the banks (particularly in villages), record keeping is deficient and there is lack of trust by the people (ITU, 2013).

Consequently, Mobile Money Transfer (MMT) is designed as a strategy for ensuring that financial services are accessible to the unbanked people (Porteous, 2006). The MMT is an advanced device from an element of an electronic transaction and banking business known as mobile banking (Orozco et al, 2007). For example, MMT services have turned to be relatively important in developing economies like Somalia, Tanzania and Uganda through remittances and isolated payments that are the most common functions of mobile money in emerging countries (ITU, 2013).The persistent migration and rise in urbanization implies that the necessity for money transmission, the informal ways of remitting money within these countries to households, families or relatives are relatively recognized. These have improved but with varied difficulties and risks like persons carrying money by themselves or using drivers or conductors who are vulnerable to highway thefts and robberies (Kim et al., 2010; Hughes & Lonie, 2007).

1.1.2 The Problem

Delineated as banking and financial transactions using mobile phones or devices (IFC, 2011), mobile money is fuelled by an increase in the use of mobile phone technology (Mbiti and Weil, 2011; Jack and Suri, 2011). According to the International Telecommunications Union (ITU), the

population using phones is expected to increase from 12.4% to 73.5% in 2015 (ITU, 2015). However this increase will still be affected by infrastructure challenges, government legislation and security. Thus, enhancing mobile money practices will require persuading policy-makers to create a favorable environment to limit the negative impact of these challenges. Despite the existence of challenges, in broad terms penetration levels of mobile money services in sub-Saharan Africa are still high. Kenya is highest followed by 37% penetration in Somalia and these services are spearheaded by companies M-Pesa and Zaad respectively.

Despite the growing importance of the service, it is affected by certain challenges such as postponements and long lines, system failure and undependable communication (Au & Kauffman, 2008). Out of these challenges and experiences, the main purpose of Mobile Money Transfer (MMT) is to lessen the remittance costs from each person to another, particularly through long distances (World Bank, 2012). These challenges have affected its penetration levels of the service in Somalia. The penetration levels of mobile money services by Zaad in Somalia are 83 % in urban areas, 73% in Internal Displacement Camps (IDPs) and 55% in rural areas (World Bank, 2017). These low levels affect financial services in rural areas (Ngugi and Pelowski, 2010) despite the expectation that rural populations need more mobile money financial services as a result of wanting banking services. In addition, they rely on financial transfers from relatives for economic support (Ngugi and Pelowski, 2010). Thus, there is need to investigate the challenges that have affected the transfer of why mobile money financial transactions have not effectively penetrated in rural areas given the fact that they are the regions in most need of financial services in Somalia. More specifically, the study uses the case of Zadd to study the factors affecting levels of mobile money penetration in rural Somalia.

1.2 Aim
Through a case study of Zadd, the main aim of the study to examine why have mobile money services not effectively penetrated some areas of Mogadishu given that it is in most need of financial services in Somalia?

1.3 Objectives

1- To understand what influences customer adoption of mobile money services transfer in Mogadishu

2-To identify how user acceptance of mobile money applications affect their penetrations levels in Mogadishu

3-To examine the impact of external factors such as environmental and technological habe on penetration of MMS in Mogadishu

To achieve the above objectives, the research will rely on the following hypotheses:

Hypothesis 1: Perceived ease of use influences mobile money penetration levels

Hypothesis 2: Perceived usefulness (attitude) of MMS impacts on the behavioral of the users

Hypothesis 3: Perceived Trust influences the levels of mobile penetration by influencing users

Hypothesis 4: Perceived risk negatively influences users' application of MMS

Hypothesis 5: Technological and Environmental factors have an impact on the use of MMS

1.4 Significance of the Study research

The study will provide more knowledge on the area of financial innovation as well as money transfer. The study will also be useful to business people, mobile money operators, legislators, technology inventors, development organizations and further mobile banking shareholders. It will also throw more light on how the mobile money approach can be appreciated in improving on businesses and their proprietors.

Furthermore, the study facilitates more scholarship on how examples of Zadd can be multiplied to transform many business practices and support financial inclusion subsequently, increased economic growth (Mbogo, 2010). The knowledge and understanding from this appraisal also offers significant

information to all appropriate stakeholders ensuing into creation of an appropriate environment for the operation of mobile money services. Broadly, the study will help in improving the chances for many people to utilize mobile money services.

1.5 Scope of the Study

This study concentrates on the challenges affecting mobile money penetration levels in Mogadishu. These entail factors that influence the acceptance and adoption of mobile money like perceived ease of usage, perceived effectiveness, perceived trust, perceived risk, technology and environmental factors, attitude towards mobile money services use in Mogadishu. Furthermore, the scope of the study looks at only one operator of mobile money services Zadd.

1.6 Study Limitations

Normally, study limitations are the weaknesses of the study as identified by the researcher. According to Creswell (2005), study limitations usually relate to failure to get respondents or shortage of respondents or participants, mistakes that occur while measuring, small sample population size including other factors usually associated with data collection and data analysis. The study limitation entail sample selection of the mobile operators by using simply one authorized MM network operator. This limitation can be addressed through ensuring that the sample is carefully selected to offer Zadd that has been involved in mobile money transfer services for a long period in Mogadishu.

1.7 Chapter Outline

Chapter One: This chapter presents the introduction to the study research by providing the research background, the problem, aim and the study objectives as well as the hypotheses in the study. The chapter further outlines the study contributions, scope, limitations and the chapter outline.

Chapter Two: This discusses the main theoretical framework of the study. It looks at the main models that deal with technology diffusion and acceptance. Furthermore the literature discusses the recent relevant empirical literature in the study. The chapter provides mobile money definition, main drivers of mobile money and its principles. In addition it provides the background of Zadd in Mogadishu. The chapter ends with the conceptual framework which creates the foundation of the research study.

Chapter Three: Discusses the main methodology of the study by looking at the procedure followed in the research. The chapter provides a complete explanation of the study methods applied in responding to the research questions of the study. It also offers the justification for methodological selections comprising the data analysis methods.

Chapter Four: Presents the findings of the study and highlights the analyses as well as the discussion of the empirical findings. It also shows the key findings of the study explaining the significant study results relating to the available literature.

Chapter Five: It ties up the whole dissertation together by summarizing the important research study conclusions. It demonstrates the theoretical importance and contributions to academic knowledge and concludes with proposed recommendations for more research studies.

2.0 CHAPTER TWO

2.1 THEORETICAL FRAMEWORK

2.1.1 Introduction

This chapter presents and challenges that impact its penetration levels in Somalia. The penetration and adoption of mobile money services is dependent on individual decisions, the quality of services and the infrastructure provided (Nielson, 2013). Adopting of a specific technology is a voluntary choice that is realized only when the adopter benefits from the new service than what was already in place. In addition, the adopter must be aware of the consequences of adopting the new technology and have a trust in the new mechanism (Dzokoto et al, 2016). Hence, there is need to examine the diffusion and adoption of technology theories that explain possible consumer behavior and challenges, which influence its adoption and acceptance. The chapter is divided into two main sections: the first section deals with the theories of technology adoption and diffusion and the second section looks at the previous literature on which this dissertation is more pertinent to examine the challenges of mobile money penetration in Somalia.

2.1.2 Theoretical Background

The choice to adopt a new technology is influenced by the attitude of the adopter and the benefits of the technology. This involves a cost-benefit

analysis on whether adopting new technology is more beneficial than the old one and does not make them to incur any cost. This cost-benefit analysis by the adopter explains how attitudes towards mobile money use by adopters are created. These attitudes are contingent on a number of factors such as personal and physiological traits of the person, trust in the new system, need, personal control as well as social aspects like the perceived usefulness of the new technology. Furthermore, the adopter is influenced by the level of divisibility, aesthetic attributes, time for use, leverage potential over other technologies, record-keeping, accessibility the cost involved and simplicity in use. To complement these attributes, promoters of the technology influence adopters through extensive marketing and training campaigns as well as alternative schemes to effect payment for purchases (Asongu, 2015; Dzokoto et al, 2016; Asongu et al, 2016).

A number of researchers in information technology (Chen, 2008; Carlson, 2006; Nyaga and Ogollah, 2015; Njenga et al, 2016) have shown that theories and models have the ability to predict and explicate the behavior of the users of the technology. These studies have examined the challenges that impact on technology adoption and usage. According to Yousafzai et al. (2010), there are three major theories that explain technology adoption and usage. These are the theory of planned behavior (TPB), the theory of reasoned action (TRA) and the technology acceptance model (TAM).

2.1.3 Theory of Reasoned Action (TRA)

Developed by Ajzen and Fishbein (1980), its basis is that consumers are rational beings who reflect on the actions they are about to take as well as their outcomes. It is the foundation of attitude-behavior relations in that it provides a means on how to model the attitude of the individual as well as their ability to make decisions. According to this model, the individual's actual behavior is dictated by his aptitude in making decisions. TRA proposes that beliefs impact on attitude and social norms that subsequently ensue into personal behavior. Intention represents the person's cognitive

inclination towards a specific conduct. However, this model has been found not to influence customers' habitual behavior especially in the banking industry (Wan et al, 2005).

2.1.4 Theory of Planned Behavior (TPB)

TPB is a consequence of the TRA however, with an extra addition of perceived behavior control (PBC). It identifies the shortcomings of TRA and takes into consideration that humans have little control over a specific situation. TPB also identifies the strength of behavior as being deliberate and planned. It facilitates in modeling for individual behavior where they have no control or resources to implement a certain behavior freely (Ajzen, 1991). This model presents three factors that have an impact on the behavior and objective of a person's action.

These entail normative factors like beliefs about a person's expectations and attitudinal factors like behavioral beliefs of certain attitudes. In addition, the model considers perceived behavioral control on openings, resources and other impediments that impact on an attitude. According to Shih and Fang (2004), this model is predictive when used to examine a customers' attitude and norms especially in internet banking. Their study carried out in Taiwan indicated that attitude is very important in adopting an intention. Complementing their research, Khalifa et.al (2011) have indicated that TPB is an excellent moderator for the connection between attitude and intention.

2.1.5 Technology Acceptance Model (TAM)

The third model is the TAM, which extends the TRA by taking into consideration people who adopt a new technology through 'behavioral intention to accept and use' a specific technology. The model was developed out of the TRA model with the aim of identifying   the contributory connections between assumed "usefulness, supposed ease of use, users'

attitudes, intentions and actual usage behavior" (Davis 1989). Davis (1989) has stated that perceived usefulness is "the degree to which a person believes that using a particular system would enhance his or her performance".

As a consequence, he developed and authenticated excellent measures for forecasting as well as elucidating usage which ensued into perceived usefulness and perceived ease of use as important predictors of system usage. Thus, TAM substitutes predictors for attitude, which are stressed in TRA with supposed usefulness and supposed ease of use. Despite its stress of the two concepts, perceived use and supposed ease, the application of a certain technology will always depend on the quality of the service (Njenga, et al, 2016).

Heyer and Mas (2011) have stated that the usefulness of a specific technology is dependent on potential demand for mobile money based on weighing among the other alternative technologies. Lule et al, (2012) used the TAM to investigate factors that impact on the implementation of mobile banking in Kenya. They studied the evaluation of "M-Kesho", a mobile bank application in Kenya. Their findings indicated that perceived ease of use, perceived usefulness, perceived self-efficacy and perceived reliability were the major factors that influenced its adoption by customers in mobile banking.

2.1.6 Definition and Principles of Mobile Money Services

A group of studies that will be of focus on the subject have tried to define mobile money and they present it as all those financial service available to the consumers through mobile phone services (Ali and Dhaha, 2014; Kasseeah and Tandrayen-Ragoobur, 2012; Nyaga and Ogollah, 2015; Otieno et al, 2016). These studies broadly delineate mobile money services as applying to balance checks, deposits, withdrawals, cash transfers, right to credit, remitting across borders, paying bills and buying airtime. Expanding on the definition, Kasseeah and Tandrayen-Ragoobur (2012) have stated that it encompasses balance checks, withdrawing and depositing of money and

transfer of funds, savings, credit access, overseas remittances, bill expenses and purchase of airtime.

Conversely, Brian (2015) contends that mobile money is a catalyst or driving force for financial inclusion plus development of digital platforms. Mobile money companies are not financial intermediaries because they do not even carry out banking activities. Instead, they supplement banking through partnering with mobile money dealers offer who offer a cost-effective system for commercial banks or microfinance institutions (MFIs). In addition, they are able to accumulate public payments and provide credit services to new clients who are beyond their reach. It is in this manner, which mobile money has contributed to the increase of digital platforms through offering a readily accessible payment strategy for several startups. Furthermore, there is agreement in the literature that mobile money is an important catalyst in the development of financial services and inclusion of the poor into a bankable economy.

According to (Wanyonyi and Bwisa, 2013; Stremlau and Osman, 2015) mobile money services have helped to expand digital platforms and financial services by extending the number of people who can access banking services. This has especially facilitated those who reside in rural areas that did have the chances of accessing banking services. Subsequently, this has ensued into increased business and international trade which were limited because of poor financial services. The authors further state that the success of mobile money services is contingent on a number of principles for them to offer necessary services to the people. These principles entail provision of appropriate and affordable services and enabling people to access the right channels for delivering the services. In addition, the products offered by mobile money services need to be affordable by the people. The services have to be cost-effective so that their cost is within the financial means of the users if they are intended to help them (Kuar, 2013; Yu, 2012; Mallat, 2007).

As a consequence, the products to be appropriate must be able to fulfill the needs of the consumers as well as making sure that they are not exploited.

This should take into consideration the laws, the culture and tastes and preferences of the consumers so that they are not taken advantage (Stremlau and Osman, 2015; Popham, 2013). I addition, there is need to fulfill the principle of usage when providing an appropriate service of financial services to the benefit of the consumer so that they are able to access it without any limitations. Quality on the other hand, is intended to include the affordability of the service by the consumer through understanding the use of the service (Kuar, 2013; Allen et al, 2014).

Financial inclusion definition recommends a set of values including the access principle and this takes into account the accessibility of cheap and relevant financial services, products as well as the distribution channels to the target clients to support accessibility worldwide. The principle of affordability requires that the products or services are offered at cheap and affordable cost. The continuum of financial organizations should attempt to reduce the cost to- customer and the cost-to-serve so as to ensure that the charges for products or services are in line with the planned and target markets' capacity to pay for them (Kuar, 2013).

The principle of appropriateness of financial inclusion requires that a service or product should respond to the needs of customers and ensure their security and self-respect, mindful of control and language obstacles (Rahman, 2009). However, usage is defined as the act of applying and employing a financial product or service. Therefore, access is of less importance in the situation where targeted individuals are not utilizing the product or a service thus actual inclusion must be complemented by usage. Quality entails various ways in which financial services are provided and involves traits associated with affordability, ease, suitability, product appropriateness, safety, dignity of handling, and client security. Simplicity involves the easiness of usage, appreciation and recognition of the product and services, humble language and channels applied to provide them (Kuar, 2013; Allen et al, 2014).

Although the studies above have laid a foundation in our understanding of mobile money services, they fail to discuss their benefits as well as the

challenges met by the people while adopting the services. The studies fail to show how the services can be of use to the poor yet it is the poor in rural areas who need the service most. Had they discussed the challenges faced by the people in adopting the service, it would have provided insights on how mobile money services can be extended to the rural areas that lack banking services.

2.2 Empirical Literature

Complementing the theories of technology adoption and diffusion above, this section expands our understanding of mobile money penetration and its challenges by reviewing the empirical literature.   The by Dupas and Robinson (2011) on application of MMS in Kenya found that the utilization of MMS saving for medical care needs is high. Furthermore, the study indicated that women use MMS savings accounts to save for the improvement and development of the size of their businesses. Subsequently, this leads into increased earnings and reduced expenditures improving their earnings. Although this study found a correlation between the use of MMS and savings, it did not indicate how expenditures dropped.

However, a study by Mbiti and Weil (2011) revealed that with the initiation of M-PESA in Kenya, there is a reduction in the charges of money transfers. Furthermore, they found a rise in the rate of receipt of remittances indicating that there is more financial inclusion in the country with more MMS penetration. According to Batista and Vicente (2013) minimal willingness to remit was influenced by the accessibility of mobile money in Mozambique resulting for reduced MMS penetration challenges.   The authors also, realized that there were supplementary impacts of mobile money for traditional choices for investments, savings and remittances.

According to Mas and Radcliffe (2010) mobile banking changes fixed costs into moveable costs as well as allowing enough time to permit the agent to support the service besides various products. Bhavhani et al (2008) revealed the impacts of applying mobile money in enhancing the flow of information

among transacting parties facilitates more business transactions to be carried out in the shortest time possible without travelling. This was stated specifically for consumers in rural places where buyers and sellers would have loved to move to urban areas to send or receive money. Therefore, mobile money utilization leads to reduction in transport costs and subsequently improved customer surplus (Sife et al, 2010).

Aker et al, (2011) focus on the impacts of utilizing mobile money accounts for provision of money transfers against traditional systems in Niger. Definitely, they established that mobile money minimized the general transaction charges on recipients, including providing an improvement in freedom, flexibility and confidentiality. A qualitative experimental study carried out by Vong et al (2012) in rural Cambodia identifies benefits of time, safety and suitability for micro-entrepreneurs who apply mobile money services in rural regions.

According to the study by Jack and Suri (2011), 71% of all families show saving money at home, "under their mattress". Furthermore, they discovered 75% of homes which are M-PESA users indicate also operating their mobile money accounts for saving. Amongst the M-PESA users, twenty one percent stated that mobile money is the best saving mechanism. Data obtained from Tanzania from 3,000 homes shows that 90% of people using mobile money with no bank account indicate utilizing their mobile account to save money earned in the previous 6 months. According to a simple pilot study in Uganda, findings show that across consumers, irrespective of their remaining balances, the principal objective of saving on their mobile money accounts was for crises. Nandhi (2012) agrees with the above mentioned study results and contends that essentially, Mobile Money Services act as a phone savings accounts, hence allowing persons with no formal bank account to participate in a secure and more effective savings mechanism. MMS certainly increases efficacy and consistency of saving.

Morawczynski (2011) discovered that earnings for mobile money users in rural areas multiplied because of cash transfers that have resulted into

increased savings. Complementing their study, Demombynes and Thegeya (2012) revealed the likelihood of increased mobile money savings whereas Jack and Suri (2011) emphasize that mobile money users saved to stock money to protect it from threats of theft and inaccessibility by other household members. They also assume that savings contain the possibility of accumulating social value to people restricted by charges required in opening an account in a bank and long distance between their home and the nearest formal savings institution (Jack and Suri, 2011). In a similar study that also considered MMS penetration levels conducted by Oluwatayo (2013), it indicates that the improvement in network increases by Mobile Money System users. This is also, facilitated by the transmission of mobile phones in the whole of Zimbabwe, which has avoided the infrastructural obstacles. This helps developing economies through mobile phone systems to respond to poor infrastructure and physical remoteness which result into high costs of providing banking services to rural populations.

Conversely, Alleman and Rappoport (2010) consider the impact of MMS through remittances. They assert that Mobile Money Services enable consumers to gain from remittances sent by their relatives or friends living overseas. This only, assumed all other factors remaining constant-will lead to better economic well-being since the poor people will have an income earning source. Allen et al (2014) similarly state that the application of mobile money improved cash flow accumulating domestic consumption for people in rural areas thus improving economic activity. They also emphasize that the remittance circulation to rural areas influence economic activity by allowing *"just-in-time"* money transfers which make capital accessible at the time when it is needed.

Another study by Thulani, Chitakunye and Chummun (2014) investigated the use of mobile money on increasing financial inclusion. They found that mobile money utilization by the unbanked individuals in rural areas is higher, especially for transfer as well as delivery of remittances. On the other hand, the saving and loan component of MM were not very common. MM users were still depending on their old methods of savings as well as borrowing.

Nevertheless, regardless of the user privileges, Mbiti and Weil (2011) study results in Kenya found out that clients do not seem to utilize mobile money account for keeping value.

The examination of present body of empirical research in the utilization of MMS for financial inclusion shows the levels of penetration of MMS among the populations. Although the interest in this area of research has been broad, there is no clear indication regarding financial inclusion taking into account availability, utilization, cheapness and simplicity amongst rural populations of Somalia. There has been a discussion on the impact of MMS to financial inclusion as several studies recommend that MMS enhance financial inclusion whereas other studies do not provide clear evidence. In line with the specified gaps in the literature, the study will attempt to offer empirical evidence regarding the influence of MMS levels of penetration and financial inclusion through mobile payments in rural areas in Somalia.

2.3 Challenges of MMS Penetration

After having reviewed the models of technology diffusion and adoption as well as empirical studies on MMS, this section reviews the literature on the challenges impacting MMS levels of penetration in rural areas and adoption. The challenges limiting the penetration of MMS into rural areas may be broadly categorized into legal and operational domains.

2.4 Legal limitations

According Ondiege (2015) challenges associated with fraud, safety, coordination and communication with their service provider can be described as legal. These together with a prevalently interrupted system of communication seem to be the most common in East African countries. Mobile Money Operators (MNOs) still experience challenges in the legal and regulatory setting; Information Communication Technology-infrastructure expenses and rivalry between MNOs. In addition, they are affected by

inadequate interoperability mobile money structures; IT safety as well as poor guidelines to respond to intra-country or intra-regional mobile money services. These challenges, demand for a need to address matters that relate to the improvement of helpful regulatory frameworks. Furthermore, there is need to provide enough interoperability by filling the gap in financial literacy and financial inclusion.

2.5 Operational issues

Kumbhar (2011) has recognized qualitative challenges at operational level as being associated with risk, rapidity of service, comfort of usage, innovativeness, cost efficiency and receptiveness. In addition, he identifies customer's education and credit rehabilitation as substantial clusters for MMS to have higher levels of penetration and financial inclusion in third world countries. Furthermore at operational level, Ishengoma (2011) has stated that financial safety is important given the fact that most of the financial transactions are carried out in rural areas. The study by Colombage (2011) in Sri Lanka indicated that a small percentage of e-banking challenge was associated with financial realization, financial literacy and income levels. However, some studies (Mbiti and Weil, 2011; Thulani, et al., 2014) have indicated that a major challenge affecting bulk payments is to have a vital channel for making value into the system of mobile money despite low financial liquidity by MM agents. The limitations affecting MMS levels of penetration and inclusion mentioned above are common in rural areas in Somalia. Thus, it is fundamental to identify the real obstacles that limit MMs penetration in Somalia so that appropriate interventions are made.

2.6 Conceptual framework

Evincing from the technology adoption, diffusion theories and the empirical literature reviewed and extending the TAM model by incorporating other constructs derived from challenges of affecting penetration of MMS, the

conceptual framework of the study is summarized in the following paragraphs below.

2.6.1 Perceived Ease of Use (PEU)

PEU is considered a strong predictor of behavioral intention to adopt the technology (Davis, 1989). PEU refers to the perception of the user that using the systems is free of effort. PEU in the literature was found to have significant effect on the behavioral intention to use a technology system (Luarn and Lin, 2005). This means that if the students believed that the use of EVC Plus is easy, they will use it. Furthermore, it has found that PEU directly influences PU (Davis, 1989). Thus, the study hypothesizes that:

Hypothesis 1: Perceived ease of use influences mobile money penetration levels

2.6.2 Perceived Usefulness (PU)

The intention to use a new system of technology is influenced by PU (Davis, 1989). PU is understood as the extent to which a person assumes that the use of a system increases his or her performance. According to Wang et.al, (2008) PU is seen as one of the main influencers of choosing to use a new technology. Thus, MMS are advantageous for their daily transactions that influence their choice of use (Tobbin, 2010). Therefore, this study hypothesizes that:

Hypothesis 2: Perceived usefulness of MMS impacts on the behavioral of the users

2.6.3 Perceived Trust (PT)

Trust is important in every transaction whether business or personal in nature. As noted by Gefen (2000: 726), trust is "the confidence a person has in his or her favorable expectations of what other people will do, based, in many cases, on previous interactions". He found that trust construct had statistically significant effect on purchase and inquire intentions. According to Dahlberg, Mallat, and Öörni (2003) perceived trust and disposition to trust are essential in the TAM model when it comes to mobile payments. In

another study, Daud, Kassim, Said, and Noor (2011) found that perceived trust positively influences the intention to use mobile banking service in Malaysia. Similarly, mobile trust was found to be a major predictor of intention to accept wireless mobile data services in China (Lu, Lui, Yu, and Wang, 2008). In MMT context, trust was found among others to have effect on the behavioral intention to use MMT among Ghana respondents (Tobbin, 2010). Therefore, this study assumes that:

Hypothesis 3: Perceived Trust influences the levels of mobile penetration by influencing users

2.6.4 Perceived Risk (PR)

Perceived risk is referred to "a consumers" belief about the potential uncertain negative outcomes from the mobile money transaction" (Tobbin, 2010:4). Perceived risk was found to be a key determinant of intention to use MMT, Mobile banking, and e-banking (Kallamarthodi & Vaithiyanathan, 2012; Al-Jabri & Sohail, 2012). There are perceived risks of using MMT services that may lead to reduction in penetration of mobile money services in Mogadishu. As such, the current study postulates that:

Hypothesis 4: Perceived risk negatively influences users' application of MMS

2.6.5 Environmental and Technological Factors

Regarding environmental and technological factors they have been found to impact on the penetration of MMS. Users of mobile money services affirm that mobile money is frequently affected by power outages. According to Kirui et al., (2013) the competition for customers by mobile money businesses has led to creation of more stable technology as well as strong technological support mechanisms. Conversely, Merit (2010) has argued that mobile money transfer systems have led to new challenges on how to put into place new regulatory infrastructures. Thus, we postulate that:

Hypothesis 5: Technological and Environmental factors have an impact on the use of MMS

Table 2.1 **Concept Map**

Concept	Sub-Concepts
Perceived ease of use	Technological factors
Perceived usefulness	Environmental factors
Perceived Trust	Infrastructural Networks
Perceived Risk	Operational/ Legal/ Costs
Reliability of MMS	Network Infrastructure

The concepts identified in the concept map above will guide this study to ascertain the challenges that impact MMS penetration levels and financial inclusion offered by M-Pesa and Zadd in Mogadishu especially the city outskirts. These concepts will also be the guide in the interpretation of the results of the study.

2.7 Conclusion

In this chapter, we have reviewed the main theories of technology adoption and diffusion in relation to MMS. The chapter has carefully examined the relevance of theory of reasoned action, theory of planned behavior and the technology acceptance model that enlighten our understanding of how consumers attitudes are influenced and decisions made on use of MMS. Furthermore, the chapter has reviewed extant empirical literature on the subject throwing more light on our understanding of the benefits of MMS and challenges in its adoption. It is through understanding the challenges that impact on its adoption that we can decipher the penetration levels of

the service among the population in Somalia. Lastly, the chapter has identified the main conceptual framework of the study, which will act as guide for the research. Evincing from the discussion in this chapter, the next chapter discusses the methodology on how the research is to be conducted.

3.0 CHAPTER THREE

3.1 METHODOLOGY

3.1.1 Introduction

This chapter presents the methodological approach that is to be followed in this dissertation. The choice of the research method is dictated by the research questions posed in the study. Since the research investigates the challenges facing mobile money penetration in Mogadishu, the research is arranged in a manner intended to fulfill this particular aim. As a consequence, the chapter discusses the processes and techniques applied to fulfill the aim of the study through probing the hypotheses posed. Thus, the chapter illustrates the philosophical tradition and approach followed, the choices taken and instruments applied for data collection and analysis. To fulfill the objectives of the study, the chapter is divided into different sections. These are the explanation of the research strategy followed by detailing the type of data and how it was gathered. Furthermore, the chapter discusses the different instruments applied together with the validity and reliability. It concludes with the ethical considerations of the study.

3.1.2 Philosophical perspectives

Research is underpinned by different theoretical perspectives that define the researchers approach to create knowledge within a particular context. According to Saunders et al, (2009) methodological philosophy is concerned with the examination of pertinent ideas. This entails a defense of the plan and rationale of the research against other choices. This is done because the research aims at preventing favoring one research philosophy against another. In most cases, each research philosophy has a role to play and more suited to a type of research than the other depending on the research questions raised in the study (Bryman and Bell, 2007). Most research relies on either positivism or interpretivism with positivism being derived from natural sciences with independence from the topic of research. However,

interpretivism bases itself on observing and recognizing the world from what is seen.

Research that relies on positivism focuses mainly on theories so that the researcher is able to predict through the social phenomenon (Collis and Hussey, 2009). It is a philosophical tradition which deals with observation of data and is characterized by survey research and experimental approaches (Jupp, 2006). However, for interpretivists there is an existence of the mode of interaction between the researcher and the topic being studied. Positivists have criticized interpretivists to lack objectivity. This is because they rely on feelings, perceptions and the external environments as well as individual beliefs for their analyses (Jancowicz, 2005). Conversely, positivists pride themselves of rational deductions and objectivity of their findings because they can be replicated by other researchers following the same methods. Thus, since the main research question of this study is identifying the challenges that impact on mobile money penetration, this research will be situated within the positivist tradition.

3.2 Existing approaches

Normally, the choice of the method chosen for a particular research is influenced by the research questions raised in the study. This alludes to the fact that the choice of the method applied by the researcher broadly considers the type of data, its collection and how it is to be analyzed (Johannesen, Tufte & Christoffersen, 2010). Invariably, the preference for the method is done between qualitative and quantitative methods of research. According to Bryman (2012) the two major methods of research for conducting a social inquiry are the quantitative or qualitative methods. These methods are characterized by disparate qualities and mainly differentiated by structure. The quantitative method is more structured as it relies on quantifiable data to investigate and validate the theoretical hypotheses.

Thus, the choice of the method to follow for research is normally dependent on the researchers' choice and perspective. On the other hand, the qualitative method especially deals with the process through which the subject is being studied (Ringdal, 2013). Thus, the studies that rely on a qualitative method are normally carried out on a very small scale unlike those done through a quantitative research methodology. The quantitative research methodology studies issues on a very large scale and delves deeper into the subject matter being studied. Although it does not rely on previous theory, it is usually applied to set up new hypotheses as a basis for theory building. In this manner, the quantitative theory helps to establish the point of argument from which the participants view issues of research.

It is therefore more appropriate to choose a qualitative methodology when studying observable facts that are close to the topic being studied. This facilitates the qualitative study method in explaining the world as well as its social structure by focusing on respondents in their natural settings (Ringdal, 2013). Conversely, the quantitative study is advantageous in that it helps to study the population which is a distance further from the researcher (Ringdal, 2013). As a consequence, it involves statistics as well as numbers, which helps the researcher to define and describe differences and findings in the population. It is different from the qualitative method, which explains the social setting through describing what is observed by the researcher (Blaikie, 2010).

3.3 Selected Research Design

The research questions in study could be answered by both qualitative and quantitative methods. Qualitative methods could be advantageous in that they provide an in depth understanding of the research phenomenon through all-inclusive responses to the research questions posed in the dissertation. Conversely, interviews are conducted depending on the respondents' distinctiveness and their accessibility. However, the dangers

posed by interviewees in responding to interview questions indicate that a quantitative research methodology is more appropriate for this study and given the time frame of the study. This will save the researcher from spending a lot of time to gather data. And, given the limitation of a qualitative research approach that it covers a small size of the population a quantitative approach will enable the researcher to cover a wider population in a short time frame. In addition, the success of primary research using a questionnaire is dependent on the respondents' desire and interest together with availability of time. Thus, the quantitative approach is seen to be more appropriate for the research.

This study relies on both quantitative and qualitative data collection approaches through desk research and telephone interviews. Multiple data sources are useful in that they facilitates us to triangulate different sources of evidence and data collection methods like document analysis and interviews. The qualitative data involved 20 in-depth telephone interviews conducted with project experts of Zadd and managers of mobile money shops. The interviews lasted about 20 minutes each. The interviewees indicated that they knew a lot about the challenges affecting mobile money penetration in Mogadishu (Eisenhardt, 1989). The interviews will be arranged using a likert scale to obtain the level of the answers.

Quantitative data sources were gathered from secondary sources and these included Zadd company reports, industry reports, trade journals, technical journals, newspapers and magazines articles, as well as websites articles. Another source of data was from sector databases like the GSM Association (GSMA), the International Telecommunication Union (ITU), the World Bank and Global Findex.

3.3.1 The Case Study Approach

Although the methodology deemed suitable for this study is quantitative, a descriptive case study approach is chosen. This is done to obtain a bigger picture of the challenges affecting mobile money penetration in Mogadishu. The choice of Zadd as a case study is derived from its ability in complementing the quantitative methodology. The case was chosen for two fundamental reasons: First, mobile money market relies on technology which is in a constant state of flux such that it improved to make sure that many people with no means of payment and bank accounts in Mogadishu use the service. It provides avenues to research on finding out why mobile money services have not penetrated in some areas around Mogadishu.

The second reason is that mobile payment entails multiple services which allude to use of multiple technologies. The use of multiple technologies in one service requires an investigation why the system has been successful in some areas like in the middle of the city than in the outskirts of the city. The study uses the descriptive case of Zadd in Somalia as to explore the challenges that impact the adoption level of the service, its availability to the population and how geographical location affects its penetration levels. Yin (1994) has defined a case study as "research situations where the number of variables of interest far outstrips the number of data points (Yin, 1994: 13). Thus, the case study approach is more appropriate for understanding the factors that impact on mobile money penetration in and around the Mogadishu population.

This research method is most fit because for the purposes of this study and the Independent variable will be the mobile money penetration levels (MP). Its data is obtained from GSM Association (GSMA) and the International Telecommunication Union. The dependent variables in the study are perceived ease of use (PEU), Perceived Usefulness (PU) Perceived Trust (PT), Perceive Risk (PR), Environmental Factors (EF), Technological Factors (TF) and Attitude towards MMS (AT).

3.4 Research Hypotheses

According to Blumberg, Cooper and Schindler (2008) hypotheses are statements in which researchers assign variables to cases. Given the nature of this study, we shall rely on a co-relational hypothesis to examine the causal relationship of mobile money penetration levels on the dependent variables. Furthermore, the study will establish the conditions that favour mobile money business in Mogadishu. Thus, the hypotheses of this study seek to fulfil the following objectives:

1. To understand what influences customer adoption of mobile money services transfer in Mogadishu
2. To identify how user acceptance of mobile money uses affects their penetrations levels in Mogadishu
3. Which environmental and technological factors influence mobile money penetration services in Mogadishu

The hypotheses are developed following the literature by (Ali and Dhaha, 2014; Nyaga and Ogollah, 2015; Otieno et al, 2016). Thus the major stage of establishing the extent of mobile money penetration levels, begins with examination of an impact on dependent variables and specification of the model. To answer the research questions above, the study considered the following hypotheses:-

Hypothesis 1: Perceived ease of use influences mobile money penetration levels

Hypothesis 2: Perceived usefulness (attitude) of MMS impacts on the behavioral of the users

Hypothesis 3: Perceived Trust influences the levels of mobile penetration by influencing users

Hypothesis 4; Perceived risk negatively influences users application of MMS

Hypothesis 5: Technological and Environmental factors have an impact on the use of MMS

3.5 Data Analysis

Data analysis involves various closely linked operations like the creation of categories, classifications of raw data via coding, tabulation as well as drawing of statistical inferences. The study will use Stata Version 13 to analyze the relationship among the variables in the study. The triangulated data gathered through secondary and primary sources will be transposed into the Stata file for interpretation. Thus, the empirical analysis of data will involve an econometric estimation and by keeping in line with the previous literature we shall control for unobservable on the variables.

A regression analysis is to be used to measure the degree of correlation between the independent and dependent variables. The equation will take the following form:

MP = f (PEU) --- (a)

Where MP Penetration Levels and (PEU) Perceived use

The practical connection between the variables and proxies can be expressed as:-

MP = f (PE,PU,PT,PR,EF,TF,AT) --- (b)

The model employed includes the following:-

$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \varepsilon$

That is, $Y = \beta_0 + \beta_1 PE + \beta_2 PU + \beta_3 PT + \beta_4 PR + \beta_5 EF + \beta_6 TF + \varepsilon$

Where:

Y = MMS penetration levels

X1 = Perceived Usefulness

X2 = Perceived Trust

X3 = Perceived Risk

X4 = Environmental factors

X5=Technological factors

X6=Attitude towards MMS

ε = stochastic error term

β1, β2, β3, β4, β 5, β 6= Slope of the regression equation

It is important that a model, which specifies the relationship between Mobile penetration levels and the dependent variables. To examine what challenges impact on mobile penetration levels in Mogadishu. Thus, the analysis will be based on a linear model as expressed below:

$$LnBPTti = α + β1PEt + β2ΔIPUt + β3ΔPTt + β4ΔPRt + β 5ΔEF+ β 6ΔTF+ εt-------------(c)$$

The regression results will be sequentially described in the proceeding chapters supported by raw data in the appendices. The adjusted r2 estimates for the regressions will be reported and their significance ascertained in relation to the variables. Using the goodness of fit line of the regressions, the significance of each model will be described so that a clear analysis and interpretation is conducted. To examine the impact of the independent variable on the dependent variables so that we can ascertain which challenges do affect the penetration levels of mobile money services in Mogadishu.

3.7 Data Validity and Reliability

While collecting the data, the investigator should ensure that it is valid in terms of research questions. Validity of data is defined as *'the best estimate of the truth of any proposition or conclusion or inference described in the research'* (Trochim and Donnelly, 2006). It should be connected to the background of the study research in order to ensure that it is applicable to the research questions. Though validity of data is quantified in this way, its relevance to the data analysis should also be taken into account (Behling and Law, 2006). Kerlinger (1986) defines validity as a degree in which the tool covers the data it is expected to measure. It is defined as the appropriateness of the sampled data or content which must be measured.

Therefore, data validity refers to the measure of inclusiveness as well as representativeness of content of the scale.

On the other hand, Joppe (2001) describes data reliability as 'the degree to which the results are reliable or consistent over time as well as perfect representation of the total study population. According to Joppe, when the outcomes of the research are repeated under the same methodology, this implies that the data is presumed to be consistent or reliable. Provided the requirements of this study, the data is regularly checked in relation to the research questions as well as the hypotheses so as to ensure that data is in line with the study aims and objectives. This assists in removing the likenesses, inconsistencies in the research study which might affect the study conclusions. In addition, grade checks of information got were done to eliminate contractions in order to ensure that it was valid, reliable and consistent with the aims of the study. As a result, all the measurable data was gathered from formal sources like organizations' websites and simply peer-reviewed journals or books were used.

3.8 Ethical Considerations

When carrying out the study, I ensured that ethical matters important to the research project were taken into account. Basing on this, I had seen it that it was important to notify the respondents earlier before they responded or gave answers to the questions. This communication entailed telling them about the aim and purpose of the research or interview as well as the reasons why the information was being gathered.

Furthermore, I also ensured that participants were to take part willingly and I had to honor and respect their reactions by treating their responses as confidential and genuine. For instance, I was very specific and I explained to the respondents that their participation and engagement is anticipated to be a voluntary one and their confidentiality was upheld. I described to them how the data collected should be used and asked for their permission and consent to contribute and participate in the study. Although, the questionnaire was administered via a telephone discussion, I had known the

participants or respondents targeted were the managers of Mobile Money businesses or shops.

4.0 CHAPTER FOUR

4.1 DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.1.1 Introduction

Following the methodology in the previous chapter, this chapter presents and discusses the findings of the study after collecting the data through both primary and secondary sources. After describing the data in the methodology, the raw data is collected through a telephone survey carried out in Mogadishu. This data is supplemented by data gathered through secondary sources. It is with this data that the analysis is carried out using Stata Version 13 and the discussion is carried out according to the hypotheses raised in the study. Using stata the variables in the study are analyzed for their significance against others to see if penetration levels are influenced by the other variables in the study. As a consequence, the chapter is divided into different sections and starts with a brief overview of Zaad, presentation of the qualitative data, the descriptive analyses of the data and the regression analysis used to test the hypotheses.

4.1.2 Overview of ZADD Services in Mogadishu

ZAAD is product of Hormuud Telecom Group and is responsible for the introduction of MMT services in Mogadishu (Ali and Dhaha, 2014). This has helped 15% of the adult population who do not have bank accounts to have access to money. After its launch in June 2009, it has become very successful in mobile money operations worldwide. Instead, of establishing a bulky agent linkage where clients would cash in as well as out of the system, ZAAD concentrated on persuading employers to share wage payments via their big payment system. This allows dealers of mobile money to keep ample balances and supplies. It also created, in parallel, their individual agent linkage with employed, remunerated staff against utilizing the

available delivery networks with outside agents which depend on the agent commissions.

The intention of this policy was to retain money in the mobile money network, through use of wage payments as a starting point to the network, and to attract digital expenditure rather than use of cash payments. To attract this conduct, ZAAD has not imposed costs on the clients or dealers during the transaction, and concentrated their energies on getting firms with big numbers of remunerated employees and dealers with huge numbers of clients. This policy was too associated with the mission of the firm mission to offer users with cheap access to the financial services.

ZAAD Company has same mobile money customer base penetration rates to Kenya's M-PESA, usually known as the prominent mobile money supplier, though serving a very small market. The key variations in the strategies of the provider include ways in which they set up their agent system or network, as well as the anchor services they provided to the consumers. Whereas the anchor product of M-PESA was person-to-person (P2P) transaction transfers, ZAAD's methodology was to inspire clients to make payments of their products as well as services through mobile money. Through this, ZAAD further created a lesser agent network, for a time being majority of the clients were keeping their cash digitally, use their electronic value (e-value), and did not rely on the agents to pay cash. However, M-PESA utilized the distribution network in existence to employ agents and motivated them by paying them commission on specific transactions. The type of Person-to-Person businesses transactions also made clients utilizing the agent network to do the cash out.

4.2 Analysis of Qualitative data: Interview Results

This section presents the findings of the study from the qualitative interviews that were conducted through the telephone (See Appendix, 2). As mentioned in Chapter Three, these interviews were conducted with managers of mobile shops that operate ZAAD services. The section presents the

description of the participants, analysis of the interview, which focuses on how customers are encouraged to use MMS and what exactly influences customers to adopt the use of MMS services as well as the challenges they meet in the use of these services.

4.2.1 Participants Description

As seen in Table 4.1 below, it is important to describe the demographic profiles of the respondents, which will aid in understanding their responses in the interviews. The demographic description of the respondents is represented by their gender, their levels of education, marital status as well as age categories.

The study conducted over 402 interviews for 20 minutes. In terms of the gender representation around 75 percent were male while 25% were female. In terms, of the level of education around 50% of the respondents had finished high school education. This enabled them to provide genuine answers to the questions that were posed to them. In relation to their marital status, majority of the respondents were married, had responsibility towards their families and viewed MMS business important as a source of family income. Furthermore, in terms of marital status, the other small group respondents were represented by those who are single. The age categories ranged from of the respondents ranged from age 18-23 and 24-50.

Table 4.1 Demographics of Respondents

Demographics	Frequency	Percentage
Gender		
Male	300	75%

Female	100	25%
Education		
Above High School	400	100%
No High School	-	-
Marital Status		
Single	100	25%
Married	300	75%
Age Categories		
18-23	150	37.2%
24-50	250	62.25%

4.2.2 Interview Responses

The telephone interviews enabled the researcher to obtain the first hand information from the respondents. This facilitated the research to gain a deep understanding of mobile money operation services. The case study of ZAAD helped the researcher to understand how mobile business is conducted. The interview questions were structured under different sections and entailed the different services offered by Hormuud Telecom Group through ZAAD to customers perceived ease of use, perceived usefulness, perceived trust, perceived risk and the impact of environmental together with technological factors.

The interviews were useful in collecting the data on these variables. According to Ghauri and Gronhaug (2005) interviews are very useful because they facilitate in the collection of data and the interviewer can go beyond to obtain extra data. In addition, they facilitate the researcher to obtain more knowledge about the values of the respondent as well as their expectations. There were seven main questions and were categorized as follows.

Table 4.2: Interview Responses

Variables	Responses
Perceived Trust	

I get the actual amount of cash when someone sends it to me	215
Effective record keeping since MM retain and keep data on the transactions performed by MM service providers	39
Perceived Risk	
It's not easy for someone to steal my money through mobile money	11
Even if my phone gets lost, I may not lose my money and it would be safe	41
In the situation of network failure , I will still make my transactions through MM	87
Perceived Usefulness (Attitude Towards MMS)	
My household members are also on mobile money network	33
My friends and workmates are on mobile money service	170
Several social and business transactions I perform are done through MM	54
Technological factors	
MM is affordable than other financial services	60
MM is simple to apply unlike other financial services	142
Accessibility to MM services is easy	54
Perceived ease to use	
It is easier to send and receive SMS	38
MM registration process is easy for me	174
MM interface is user friendly satisfying	208
It's easier for me to gain skills in the usage of MM	243
It is easy to recall the process or MM procedure	118
Environmental factors	
It is cheaper to use mobile money in my business and personal transactions	333
Mobile money assists me to avoid time wastage and charges during payments	18

There is no need to pay money when registering for mobile money	4
It is cheaper to replace a Sim card	57

Source: Field Data (2019)

4.3 Quantitative Data Presentation and Analysis

The findings of the study indicate how penetration levels of mobile money services are influenced by perceived ease of use, perceived usefulness, perceived trust, perceived risk, technological and environmental factors (see raw data in Appendix 1). The dependent variables influence the levels of penetration of mobile money service by influencing the behavioral patterns of consumers to adopt the use of mobile phone technology. Furthermore, the examination facilitates the researcher to obtain a deeper understanding of how mobile money services penetration are influenced by the extent to which consumers are able to use the mobile services in Mogadishu. The findings of the study are presented and discussed according to the hypotheses postulated in Chapter Three as derived from the literature in Chapter Two.

Hypothesis 1: Perceived ease of use influences mobile money penetration levels

Hypothesis 2: Perceived usefulness (attitude) of MMS impacts on the behavioral of the users

Hypothesis 3: Perceived Trust influences the levels of mobile penetration by influencing users

Hypothesis 4: Perceived risk negatively influences users' application of MMS

Hypothesis 5: Technological and Environmental factors have an impact on the use of MMS

The descriptive statistics in the following paragraphs indicate a synopsis of coefficients of variables investigated in the study. The mean log for levels of penetration is 70.67 while the means for perceived ease of use, perceived

usefulness (attitude), perceived trust, perceived risk and technological as well as environmental factors are 159.83, 145.83, 88.33, 73.33, 100.17 and 108.83 respectively.

4.3.1 Descriptive Analyses

Table 4.1 Summary Statistics

```
    Variable |     Obs        Mean    Std. Dev.       Min         Max
-------------+-----------------------------------------------------
  Penetratio~Y |       6     70.66667    7.501111         57          78
  PerceivedU~1 |       6     159.8333    72.60969         38         243
  PerceivedT~2 |       6     145.8333     62.1592         39         215
  PerceivedR~3 |       6     88.33333    52.99686         11         148
  Environmen~4 |       6     73.33333    128.6323          4         333
-------------+-----------------------------------------------------
  Technologi~5 |       6     100.1667    45.45951         54         158
  Attitudeto~6 |       6     108.8333     54.9997         33         170
```

```
. reg PenetrationLevelsY PerceivedUseX1 PerceivedTrustX2 PerceivedRiskX3
EnvironmentalFactorsX4 TechnologicalFactorsX5 AttitudetowardsMMSX6

note: AttitudetowardsMMSX6 omitted because of collinearity
```

Graph 4.1 Relationship between MMS Penetration level and Ease of Use

A GRAPH OF PENETRATION LEVELS(Y) AGAINST PERCIEVED USE(X1)
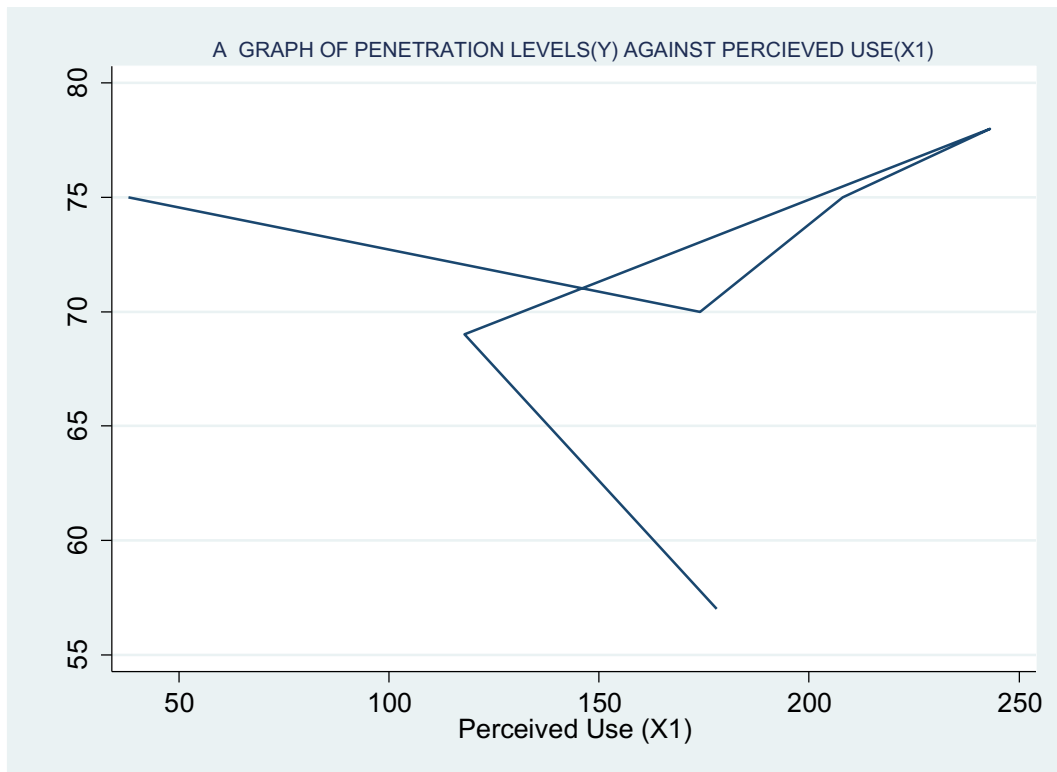
The graph above (Graph 4.1) indicates the relationship between the ease of use and penetration levels of MMS in Mogadishu. It indicates that at penetration levels of 75%, the ease of use of MMS in Mogadishu is at around 140. Conversely, there is an indication that with increased perceived use, there is also an increase in the levels of penetration of MMS in the city. This is because the perceived ease of use of MMS influences the behavioral patterns of the consumers leading to more adoption of the technology that ensues into greater levels of the service penetrating the city.

Graph 4.2 Levels of Penetration of MMS and Perceived Trust

AGRAPH OF PENETRATION LEVELS AGAINST PERCIEVED TRUST

(Graph of Penetration levels against Perceived Trust (X2), y-axis ranging 55 to 80, x-axis "Perceived Trust(X2)" ranging 50 to 250)
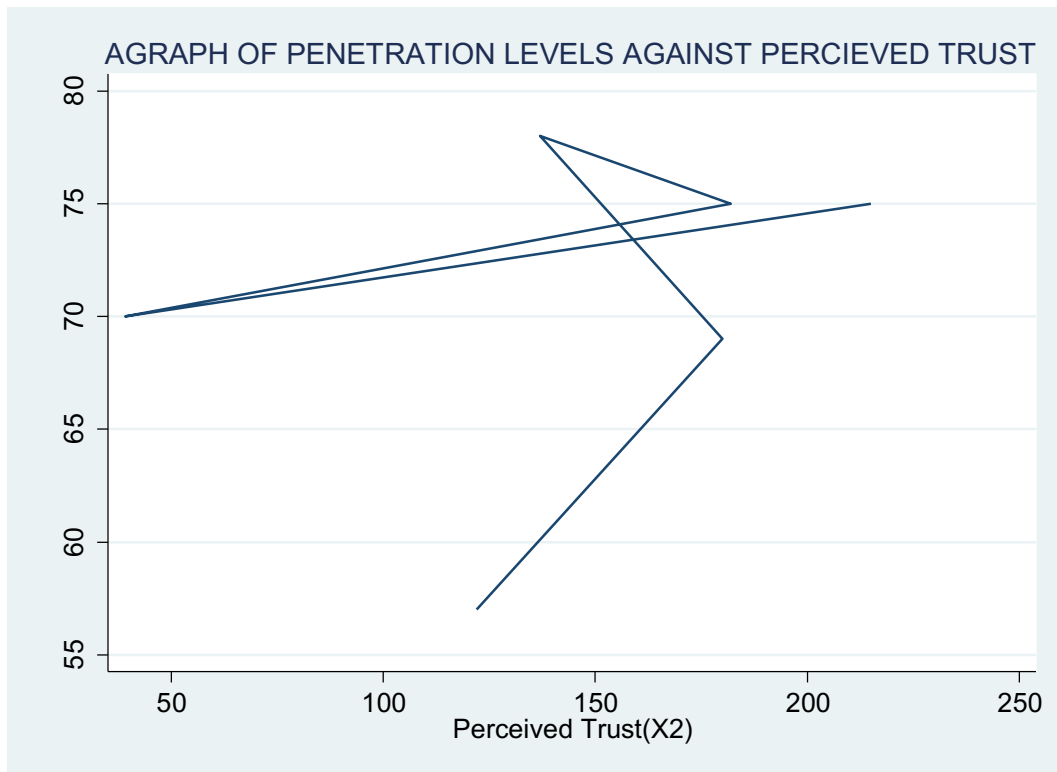
As can be seen in (Graph 4.2) above, the there is a relationship between levels of penetration of mobile money services in Mogadishu and trust in the use of those services by the population.   Perceived trust in the service normally ensues into an increase in the number of users among the population. This is done by influencing their behavioral patterns to adopt the use of mobile money services.

4.3.2 Inferential statistics

Inferential statistics are concerned with predicting and drawing inferences in relation to the population that is being observed and assessments done on the sample. These are derived from the correlation analyses done on the data between levels of penetration of mobile money services and perceived ease of use, perceived trust and other variables (perceived risk, perceived usefulness (attitude), technology and environmental factors). To verify our first hypothesis, the regression analysis was conducted between levels of penetration and perceived ease of use (Table, 4.2) to determine if there is if

there is a correlation between the two variables. Our initial hypothesis postulates that levels of penetration have a statistically significant relationship on perceived ease of use by 0.45 at 5% level of significance. Thus perceived ease of use of mobile money services by the population of Mogadishu predicts that the penetration levels are influenced by perceived ease of use, which influences them to adopt the service. Thus, if the population of Mogadishu perceives that mobile money services by Zaad are easy to use they will more likely be able to adopt it leading to increased levels of penetration.

Table 4.2 Correlation between Penetration levels and Perceived ease of use

```
     Source |       SS         df        MS                  Number of obs =        6
------------+------------------------------                  F (1,    4) =     0.21
      Model | 248213.1631  248213.163                        Prob > F      = 0.6738
   Residual | 4831292.174  1207823.04                        R-squared     = 0.0489
------------+------------------------------                  Adj R-squared = -0.1889
      Total | 5079505.335  1015901.07                        Root MSE      =    1099
```

Variable Description(Penetration levels)	Coeff(Std.Err)	t-Value
Perceived use	.0108808(.0240021)	0.45**
_Constant	4714.895(847.188)	5.57***

Table 4.3 Correlation analysis between Penetration levels and Perceived usefulness (attitude) towards MMS

```
     Source |       SS         df        MS                  Number of obs =        6
------------+------------------------------                  F (1,    4) =     0.03
      Model | 34312.98381  34312.9838                        Prob > F      = 0.8770
```

```
    Residual | 5045192.354 1261298.09        R-squared      = 0.0068

------------+-----------------------------        Adj R-squared = -0.2416

    Total | 5079505.335 1015901.07        Root MSE       = 1123.1
```

Variable Description(Penetration levels)	Coeff(Std.Err)	t-Value
Perceived usefulness(attitude)	-.0073734(.0447042)	-0.16*
_Constant	5146.59(789.0725)	6.52***

In table 4.3 above we test hypothesis two, which suggest that perceived usefulness of MMS impacts on the behavior of users leading to increased levels of penetration. However, the findings from the regression indicate that perceived usefulness has a negative correlation with penetration levels of – 0.16 at 1% levels of significance. Thus, the perceived usefulness of the use of mobile money services in Mogadishu will have a negative impact on the levels of penetration of mobile money services. Given, this finding it means that our second hypothesis was not fully supported.

The third hypothesis in the study is tested through a correlation between levels of penetration and perceived trust in MMS by the population of Mogadishu. It is assumed that perceived trust has an impact on the levels of penetration because it influences the behavior of the population ensuing to more adoption that leads to increased penetration levels. The findings of the study in the regression below (Table, 4.4) fully support the hypothesis with significance levels at 5% at 0.81. Thus, perceived trust in the use of MMS has an influence by influencing the population to trust the use of MMS that subsequently ensues into more chances of MMS penetrating into the population.

Table 4.4 Correlation between Levels of Penetration and Perceived Trust

```
      Source |       SS       df       MS              Number of obs =       6
-------------+------------------------------           F (1,    4) =    0.65
       Model | 713392.8311 713392.831              Prob > F      = 0.4642
    Residual |   4366112.5     4 1091528.13            R-squared     = 0.1404
-------------+------------------------------           Adj R-squared = -0.0744
       Total | 5079505.335 1015901.07             Root MSE      = 1044.8
```

Variable Description(Penetration levels)	Coeff(Std.Err)	t-Value
Perceived trust	.0237748(.0294083)	0.81**
_Constant	4458.489(836.9603)	5.33 ***

Our fourth hypothesis is tested through regression (in table 4.5) that examines the correlation between levels of penetration and perceived risk in the use of MMS. The finding in the regression shows that perceived risk has low levels of negative correlation at 10%, which indicates that perceived risk of using MMS does not have a greater impact on its levels of penetration. This may be because of being outweighed by benefits from the impact of other variables.

Table 4.5 Correlation between Penetration levels and Perceived Risk

```
      Source |       SS       df       MS              Number of obs =       6
-------------+------------------------------           F (1,    4) =    0.19
       Model | 230107.6951 230107.695              Prob > F      = 0.6856
    Residual | 4849397.644 1212349.41              R-squared     = 0.0453
-------------+------------------------------           Adj R-squared = -0.1934
       Total | 5079505.335 1015901.07             Root MSE      = 1101.1
```

Variable Description(Penetration levels)	Coeff(Std.Err)	t-Value

Perceived risk	-.0251498(.0577274)	-0.44***
_Constant	5295.769(738.1905)	7.17***

Our other hypothesis tests the impact of environmental and technological factors on levels of penetration. It postulates that both of these factors have an impact on the use of MMS, which leads into increase levels of use hence penetration in Mogadishu. Table 4.6 below shows the regression between levels of MMs penetration and environmental factors. The results indicate that environmental factors have a weak significant correlation with levels of penetration at 10% supporting our hypothesis that environmental factors influence levels of MMS penetration. Conversely, the regression in Table 4.7 shows the correlation between the levels of MMS penetration and technological factors. The results of the regression indicate that there is no significance between levels of MMS penetration and technological factors. The findings indicate that perceptions of the population of Mogadishu on MMS technology does not affect their use hence their levels of penetration.

Table 4.6 Correlation between Levels of Penetration and Environmental factors

```
    Source |      SS        df        MS              Number of obs =        6
------------+------------------------------          F (1,     4) =    1.24
     Model | 1205104.171 1205104.17          Prob > F      = 0.3272
  Residual | 3874401.174 968600.291          R-squared     = 0.2372
------------+------------------------------          Adj R-squared = 0.0466
     Total | 5079505.335 1015901.07          Root MSE      = 984.17


-------------------------------------------------------------------------------------
```

Variable Description(Penetration levels)	Coeff(Std.Err)	t-Value

Environmental factors	305.7923(274.149)	1.12***
_Constant	4071.781(957.0495)	4.25**

Table 4.7 Correlation between Penetration levels and Technological factors

```
     Source |      SS        df      MS               Number of obs =        6
------------+------------------------------          F( 1,     4) =    0.14
      Model |  169899.865     1  169899.865          Prob > F      =  0.7287
   Residual |  4909605.47     4  1227401.37          R-squared     =  0.0334
------------+------------------------------          Adj R-squared = -0.2082
      Total |  5079505.33     5  1015901.07          Root MSE      =  1107.9


-----------------------------------------------------------------------------
```

Variable Description(Penetration levels)	**Coeff(Std.Err)**	**t-Value**
Technological factors	389.7654(1047.611)	0.37
_Constant	3280.62(4752.224)	0.69

Table 4.8 Correlation Coefficients for all the variables

```
     Source |      SS       df      MS                Number of obs =        6
------------+------------------------------          F (4,     1) =    0.51
      Model | 189.2519394  47.3129848                Prob > F      = 0.7645
   Residual | 92.08139411  92.0813941                R-squared     = 0.6727
------------+------------------------------          Adj R-squared = -0.6365
      Total | 281.3333335  56.2666667                Root MSE      = 9.5959


-----------------------------------------------------------------------------
```

Variable Description(Penetration levels)	**Coeff(Std.Err)**	**t-Value**
Perceived use	−1.094981(.0002712)	1.11**
Perceived trust	.0002513(.0003324)	0.76*

Environmental factors	2.244121(3.360673)	0.67***
Perceived risk	-.0443342(.097623)	-0.45**
_Constant	52.31374(18.69017)	2.80**

Significance levels of the correlation *10%, **5% ***1%

Deriving from the output in (Table 4.8) it is clear that levels of penetration of MMS have a significant correlation with perceived ease of use with of 1.11 at 5% significant levels. Furthermore, levels of MMS penetration have a statistically significant correlation with perceived trust at 5% and with environmental factors at 0.67 with 1% level of significance. This alludes to what is postulated in our hypothesis that environmental factors have an impact on the adoption of MMS among the population, which ensues into increased levels of penetration.

Nonetheless, the technological factors variable does not have a statistically significant correlation with levels of penetration in Mogadishu. Thus, analysis of these the impact of the level of the penetration on all other variables facilitates us to verify our hypotheses. Hence, the findings from the correlation between levels of MMS penetration and other variables can be stated in the following equation as:

$LnBPTti = \alpha + 1.11PEt + 0.76PUt + 0.67\Delta PTt + -0.45\Delta PRt + 2.80\Delta EF + 0.37\Delta TF + \varepsilon$

4.4 Discussion of the Findings

The main objective of the study was to examine the challenges affecting mobile money service penetration in Mogadishu. Using the TAM model and extending it with concepts from the theories of planned behavior and reasoned action and focusing on Zaad. The study conducted 400 stratified telephone interviews (See Appendix, 2) of mobile money shop managers in Mogadishu to find out the challenges experienced by mobile money transfers.

An overarching response from the telephone interviews was that most of the managers of mobile money shops surveyed indicated that customers have fears and questions regarding mobile money transfers. This finding is in confirmation of other studies (Kelegama and Tilakartna, 2014) who find that customers' worry about mobile business applications. These include trust concerning security or privacy and this is confirmed to have an influence on the consumer's perception about the service and thus their interest in the usage of the service.

In relation to challenges experienced by customers who use MMS, the respondents indicated that there is need to sensitize consumers on safety measures to take note, to guarantee security of their phone devices. In confirmation with previous studies (Kumhar, 2011; Ishengoma, 2011 and Mbiti and Weil, 2011) have noted that consumers should know about the function of the passwords and pass-codes and should ensure their confidentiality for safety reasons to reduced operational challenges. Ondiege (2015) finds other challenges related to the use of MMS related to fraud, safety, coordination and communication.

Hypothesis 1: *Perceived ease of use influences mobile money penetration levels*

The aim of this study was to investigate the challenges that impact on the penetration of mobile money services through influencing the behavior of the population. The population is influenced to use MMS through the perceptions they hold on the ease of use of MMS. After the analysis, the findings indicate that ease of use as a predictor has a statistically positive correlation on 0.45 at 5% level of significance. Therefore, perceptions regarding ease of use of mobile money services by the population of Mogadishu influence levels of penetration of mobile money services. The findings of the study confirm what other studies have established that ease of use impacts on levels of MMS penetration. Studies by (Davis, 1989; Luarn and Lin, 2005; Nyaga and Ogollah, 2015; Otieno et al, 2016) find that

perceived ease of use influences the behavioral intention of the population to adopt the technology. Adoption of the technology leads to increased levels of MMS penetration.

Hypothesis 2: Perceived usefulness (attitude) of MMS impacts on the behavior of the users

Regarding perceptions of the Mogadishu population on the usefulness of MMS the findings of the study indicate that   indicate that it has a negative correlation with penetration levels of –0.16 at 1% levels of significance. Therefore, the perceived usefulness of the use of mobile money services in Mogadishu has a negative impact on the levels of penetration of mobile money services. This is contrary to other studies (Wang et.al, 2008; Tobbin, 2010) that find perceived usefulness to influence adoption of technology which ensues into higher levels of penetration.   Thus, the finding of this study indicates that perceptions on benefits of technology reduce the levels of MMs penetration in Mogadishu.

Hypothesis 3: Perceived Trust influences the levels of mobile penetration by influencing users

The case of our third hypothesis above regarding perceptions of trust in the use of MMS indicates significance levels to be at 5% on 0.81. Thus, perceived trust in the use of MMS influences the population to trust the use of MMS that subsequently ensues into more chances of MMS penetrating into the population. This finding is corroborated by other studies Dahlberg, Mallat, and Öörni (2003) who find that trust had statistically significant effect on purchase of goods and inquire intentions. Dahlberg, Mallat, and Öörni (2003) find that perceived trust and disposition are essential in the TAM model when it comes to mobile payments. In another study, Daud, Kassim, Said, and Noor (2011) found that perceived trust positively influences the intention to use mobile banking service in Malaysia. Correspondingly, Lu,

Lui, Yu, and Wang (2008) find that mobile trust is a major predictor of intention to accept wireless mobile data services in China.

Hypothesis 4: Perceived risk negatively influences users' application of MMS

As postulated in our hypothesis the findings of our study indicate that the perceptions of the population on risk manifest low levels of negative correlation at 10%, with-0.44. This is in confirmation of hypothesis that perceived risk limits the influence of MMS leading to low penetration levels among the population. Our finding is line with other studies that find perceptions of risk to determine the use of MMS, Mobile banking, and e-banking (Kallamarthodi & Vaithiyanathan, 2012; Al-Jabri & Sohail, 2012). Thus, perceptions of the population on risks of using MMS lead to reduction in penetration of mobile money services in Mogadishu. However, despite the negative impact of these perceptions on the population the findings in other variables indicate that people continue to embrace MMS leading to higher levels of MMS penetration.

Hypothesis 5: Technological and Environmental factors have an impact on the use of MMS

The findings of our study in this hypothesis indicate that environmental factors have a significant correlation with levels of penetration at 10% supporting our hypothesis that environmental factors influence levels of MMS penetration. This confirms the findings of other studies (Wanyonyi and Bwisa, 2015; Kirui et al, 2013) who find that environmental factors have an impact on levels of MMs penetration. On the other hand, the regression between technological factors and levels of penetration, indicate that there is no significance between levels of MMS penetration and technological factors. The findings indicate that perceptions of the population of Mogadishu on MMS technology do not affect their use hence their levels of penetration. This finding is contrary to the findings of other studies (Davis, 1989; Njenga

et al, 2016; Heyer and Mas, 2011) who used the TAM model to investigate factors that that affect MMS penetration and found that it is dependent on alternative technologies.

4.5 Conclusion

This chapter has presented and analyzed the findings of the study. It has discussed the empirical tests and the findings from the study that included the evaluation of the model, estimation of the findings as well testing the hypotheses. Following the hypotheses, the chapter has discussed the findings of the study. The findings of the study overwhelmingly indicate that the dependent variables have an influence on levels of mobile services penetration among the population. Hence, some pose as challenges to the penetration of mobile services in Mogadishu.

5.0 CHAPTER FIVE

5.1 CONCLUSIONS AND RECOMMENDATIONS

This chapter ties up the whole dissertation together by providing the entire summary of the study findings, the conclusions as well the recommendations. It highlights important lessons drawn from the research. This concluding chapter provides a summary of the research conclusions, recommendations and direction for future study.

5.1.1 Conclusions

The foundational objective of the study was to examine why mobile money services have not effectively penetrated some areas of Mogadishu through a case study of Zadd. Pertinently, the study aimed at identifying factors that can influence the penetration of mobile money services in Mogadishu. Following the previous literature (Ali and Dhaha, 2014; Nyaga and Ogollah, 2015; Otieno et al, 2016) an examination of the impact of perceptions of the population on levels of penetration can help us identify the factors impacting mobile money penetration in Mogadishu.

According to Otieno et al., (2016) and Bhattacherjee et al., (2008) the penetration of mobile money services are dependent on the continued use and adoption of the mobile money technology by the population. Hence, the study aimed at identifying the factors that limit the penetration of mobile money services in Mogadishu. This was done by examining factors that influence the behavior of the population to adopt mobile money technology.

In order to fulfill the aim of the research, Chapter one set out to present the research background, define the problem, aim and the study objectives as well as the hypotheses in the study.

Chapter Two, has discussed the theoretical framework by reviewing the extant literature on mobile technology diffusion and adoption theories as well as behavioral influencers such as theory of Reasoned Action (Ajzen and

Fishbein, 1980), theory of planned behavior (Ajzen, 1991) and the technology acceptance model (Davis 1989). Extending the technology acceptance model and the challenges affecting mobile money services as identified in the literature (Kumbhar, 2011; Colombage, 2011; Mbiti and Weil, 2011; Thulani, et al., 2014) seven factors were identified to lead behavioral intention of the consumers. These were perceived usefulness (attitude), perceived ease of use, perceived trust, technological and environmental factors.

Evincing from these identified factors, a conceptual framework was developed leading to the following hypotheses:

Hypothesis 1: Perceived ease of use influences mobile money penetration levels
Hypothesis 2: Perceived usefulness (attitude) of MMS impacts on the behavioral of the users
Hypothesis 3: Perceived Trust influences the levels of mobile penetration by influencing users
Hypothesis 4; Perceived risk negatively influences users application of MMS
Hypothesis 5: Technological and Environmental factors have an impact on the use of MMS

Chapter Three, discussed the methodology of the study by looking at the procedure followed in the research. The chapter has provided the explanation of the methods applied in responding to the hypotheses of the study. Through its justification of the methodological selections and data analysis, the chapter explains why it adopted both secondary and primary means of data collection. The telephone survey was chosen because the researcher wanted to identify and to statistically explain factors that influence mobile money services penetration in Mogadishu.

Chapter Four has presented and discussed the findings of the study as well as testing the hypotheses. It has highlighted the major findings of the study explaining the significant study results in relation to the literature. The data

was analyzed using Stata Version 13 which gave an output of descriptive statistics as well the regressions for the quantitative data. This was done because quantitative data analysis techniques facilitate the numerical illustration and handling of observations when one wants to describe and explain the phenomenon that reflects the data.

The findings of the study indicate that levels of penetration MMS have a significant correlation with perceived use with of 1.11 at 5% significant levels. Furthermore, levels of MMS penetration have a statistically significant correlation with perceived trust at 5% and with environmental factors at 0.67 with 1% level of significance. This confirms what is postulated in our hypothesis that environmental factors have an impact on the adoption of MMS among the population, which results into increased levels of penetration.

However, the technological factors variable does not have a statistically significant correlation with levels of penetration in Mogadishu. Therefore, the analysis of these variables facilitated the researcher to identify the factors that have an influence on levels of MMS penetration. At the same time helped in the confirmation or denial of our hypotheses. Therefore the findings from the correlation between levels of MMS penetration and other variables are stated in as follows: $LnBPTti = \alpha + 1.11PEt + 0.76PUt + 0.67\Delta PTt + -0.45\Delta PRt + 2.80\Delta EF + 0.37\Delta TF + \varepsilon$

In addition, the regression analysis has shown that there is a correlation between the dependent variables and the independent variable, which explains the behavioral intention to adopt the use of mobile money service in Mogadishu. As a consequence, all six variables out of the seven had statistical significant correlations with levels of mobile money service use levels of penetration.

The major finding of the study is that perceived risk of the use of mobile money services has a negative impact on the penetration of these services among the population of Mogadishu. In addition, it was found that technological challenges do not have an impact on the level of MMS

penetration. This findings is contrary to findings of other studies (Ratwatte, 2012; Ondiege, 2015) that have found technology to have an impact on levels of MMS penetration.

5.1.2 Recommendations

During the study, several challenges were noted and such experiences can assist greatly in making decisions as well as shaping future research on the subject. After thoughtful deliberations, the study recommended the following:
To counteract the challenges facing mobile money services and increase the levels of penetration there is need to increase mass media campaigns in the outskirts of the city to sensitize consumers about how to use the systems.

There is need to put regulatory policies and strategies in place so that they collectively design and create suitable guiding frameworks (Sonko, 2010). The working relationship must take into account a complete review of all possible guidelines governing businesses in the financial area and the communications sector. These should entail guidelines to offer reporting mechanisms for MMS in order to enable regulatory agencies to collect appropriate information administratively. This will help to improve research in the financial sector and to encourage development.

Increase the availability of cell phones to the unbanked African population is one of the most cost-effective as well as economically competent technique for increasing MMS penetration levels and financial inclusion in African countries (Duane et al, 2014). There is need to have helpful regulatory frameworks in place and restrict interoperability difficulties in the usage of Mobile Money Services.

Create a business model among the population (Vong, Fang and Insu, 2015; Sonko, 2010) so that MMS penetration levels and financial inclusion can be

effected. This model should allow all mobile money shop operators to cooperate more easily and competitively. This will also facilitate in improving teamwork among financial companies through promotion of mobile accounts into the bank accounts.

There is need to expand technology to increase MMS penetration levels and financial inclusion of city and rural dwellers. According to Ratwatte (2012) technology infrastructure facilitates increased outreach of financial services to rural areas. A well-known mobile phone network will facilitate the making of deposits and deliver immediate electronic approval to the account holder. These point-of sale devices have influenced the increase of monthly transactions of several bank outlets, both with regard to values and numbers.

They should promote financial capacity and improve financial literacy, which facilitates MMS penetration levels and financial inclusion (Kelegama and Tilakaratna, 2014). This can be achieved by contributing to increasing financial awareness, increasing understanding, skills and capacity among people and families.

They should offer education to consumers about the utilization of mobile services by boosting confidence, implementing and applying a remuneration system (Frederick, 2014). Furthermore, governments might practice the use of mobile money to pay off people's salaries, social assistance costs, allowances and pensions as a means of motivating people to apply the system. Such creative innovations encourage the development of MMS through a networked infrastructure of both operators and customers will help to reduce the expense and lessen friction points in service provision.

Mobile money shops and agents need to intensify both trainings and education of MMT agents. Recruitment of the agents' staff should be done by independent organizations or outside agencies. These must vigorously capture, follow-up, and supervise the network size of the MMT agents during

business growth and expansion. Furthermore, I propose that MNOs must put in place agents' incentives or motivation initiatives. This might influence on the behavior and performance of the agents and as well attracting customers to adopt the MM technology thereby rendering it as a reliable service.

There is need for straightforward agent monitoring and supervision so as to achieve own agent performance as well as ensuring sustainability in service delivery. For example providing right education of products/services, loyalty to transaction records, compliance with MMT regulations, general customers' training, transaction charges (overpricing), among others must be checked.

5.2 Future Research

- Adequate time for researchers in future should be provided. A study in mobile money transfer is comprehensive as different aspects require to be taken into account. The purpose of this study was to examine why mobile money services have not effectively penetrated some areas of Mogadishu in Somalia. Nevertheless, attempts to effectively analyze all the indicators were futile as more time was required to collect and conduct data analysis. The data was not easily gathered or obtained and it was also hard to get it.

- The study research carried out would be performed repeatedly using a big sample size from diverse areas in Somalia. Resource mobilization must be done especially by the future researchers/scholars.

- There is need for an inclusive approach in evaluating the MMT performance/ implementation as some of the indicators required more research. For instance, mobile money transfer users go through different experiences including providing required personal information in order to be able to use MM service. Such assessments and the required data is not clear. There is need for a uniform official MMT evaluation process to be utilized by all the MNOs irrespective of the customer's location.

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6.1 Appendix 1

RAW DATA representing Variables

Penetration Levels (Y)	Perceived Use (X1)	Perceived Trust(X2)	Perceived Risk(X3)	Environmental Factors (X4)	Technological Factors(X5)	Attitude towards MMS(X6)
75	38	215	11	333	60	33
70	174	39	41	18	142	170
75	208	182	87	4	54	54
78	243	137	127	57	158	158
69	118	180	148	22	120	120
57	178	122	116	6	67	118

Interview Questionnaire

Variables	Responses (Tick the relevant response)				
	Strongly Agree(1)	Agree(2)	Disagree(3)	Strongly Disagree(4)	Not Sure(5)
Perceived Trust					
Do you receive or get the actual amount of cash when someone sends it to you?					
Is effective record keeping part and parcel of MM transfers? Or Does MM system retain and keep data of the transaction performed by MM service providers/operators?					
Perceived Risk					
Does MM transfer involve fraud?					
Is the money transacted via MM secure or safe?					
Does network failure affect mobile money transfers?					
Social influence					
Did your household members register and subscribe to the mobile money network?					
Does your friends and workmates utilize mobile money services?					
Do you use MM in performing different social and business transactions?					
Technological factors					

Do you agree that MM is affordable than other financial services?					
Do you think MM is easier to apply unlike other financial services?					
Is accessibility to MM services easy?					
Perceived ease to use					
Do you think it is easier to send and receive SMS through MM?					
Is MM registration process easier and affordable?					
Is MM transfer user friendly and satisfying to customers?					
Did you easily gain skills in the usage of MM?					
Is it is easy for customers to recall MM process or MM procedure during transaction and other payments?					
Environmental factors					
Was it cheap for you to use mobile money in business and personal transactions?					
Does mobile money help customers to avoid time wastage and other charges which might be incurred during payments?					
Is mobile money registration process free of charge?					
Is MM system cheaper while replacing the Sim card					

Source: Field Data (2019)