UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

MOBILE MONEY TRANSFER SERVICE, ADOPTION INFLUENCING FACTORS AMONG THE POOR

BY

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Research report submitted in partial fulfillment of the requirements of Master of Science in Information Systems (MSC.IS) of the University of Nairobi.

DECLARATION

I, Nelson Steven Moyi Alubia, do hereby declare that this research project report is entirely my own work and where there's contribution of other individuals, it has been dully acknowledged. To the best of my knowledge, this research work has not been carried out before or previously presented in any other education institution in the world for similar purposes or forum.

Signature---------- Date----04/04/2012----

Nelson Steven Moyi Alubia

P56/61014/2010

I, Tonny Omwansa, do hereby certify that this project proposal has been presented for examination with my approval as the University of Nairobi supervisor

Signature---------- Date----5/4/12----

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ABSTRACT

Mobile Money Transfer Service (MMTS) is a wireless network infrastructure facilitating the exchange of cash money and electronic value between various economic actors including clients, financial service providers, businesses and the government. In the past transferring money from a sender to a receiver commonly involved use of Post Office as a formal and secure way. Money send through Post Office took longer period of time before the receiver could access the cash. This delay was undeserved by the poor who lives in a cash economy and is paid in cash. The Banks would have served to reduce time for sending and receiving cash but the poor were again driven away by huge transaction costs levied on money transfer services offered by the banks.

The advent of Mobile Money Transfer Service in Kenya has seen many people utilize the service irrespective of their social status. However; the poor seem to have adopted the Mobile Money Transfer Service, more than they have adopted any other money transfer service. Mobile money appears to have solved issues affecting the poor involving cash handling. The Mobile Money Transfer Service gives the poor a dense network of transaction outlets where they live and work, reducing the cost they incur while accessing financial services. The possibility of Mobile Money Transfer Service providers offering savings, credit, insurance and other products to the poor at low cost, look as if is meant to greatly influence them towards adopting the service. The capability to provide or get Mobile Money Transfer Service anytime any place where there is network coverage is another key driving force for the poor to adopt the service.

Indeed the uptake of Mobile Money transfer service by the poor in Kenya has been spectacular. It is against this interesting uptake that we carried out research on factors influencing adoption of Mobile Money Transfer Service by the poor .We uncovered this by considering the Unified Theory of Acceptance and Use of Technology (UTAUT) Model but included Transaction Cost as another key determinant of adoption of the service, apart from Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions.

To validate the Unified Theory of Acceptance and Use of Technology Model, survey was the main research methodology. Through stratified random sampling, our sample was drawn from Mobile Money Transfer Service subscribers and dealers/agents of Safaricom's M-Pesa, Airtel's Airtel Money and Orange's Orange money. The outcome of research findings validated the extended Unified Theory of Acceptance and Use of Technology (UTAUT) Model and serve as part of a blue print for deployment and assessment of mobile money services in developing countries where approximately 80% of the population is poor.

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LIST OF ABBREVIATIONS

AMOS	Analysis of Moment Structures
CBS	Central Bureau of Statistics
C-TAM-TPB	Combined TAM and TPB
EE	Effort Expectancy
FC	Facilitating Conditions
IDT	Innovation Diffusion Theory
IS	Information Systems
IT	Information Technology
KNBS	Kenya National Bureau of Statistics
MM	Motivational Model
MMTS	Mobile Money Transfer Service
MPCU	Model of PC Utilization
PC	Personal Computer
PE	Performance Expectancy
RCMRD	Regional Centre for Mapping of Resources for Development
SCT	Social Cognitive Theory
SEM	Structural Equation Modeling
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model 2
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology

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CHAPTER 1

INTRODUCTION

1.1 Background Information

Over time, emergences of new network infrastructures (canals, railroads, electricity, telecommunications and Internet) have had far reaching effect on economy. Improved mechanisms for transferring goods, information and people lead to innovation together with transformation of markets as existing firms restructure while new ones come forth to capture unprecedented opportunities. Mobile Money Transfer Service is a wireless network infrastructure for storing and moving money thus facilitates exchange of cash and electronic value between various economic actors including: clients, businesses, the government and financial service providers (Kendall, Maurer, Machoka, and Veniard, 2011).Mobile Money Transfer Service has advanced technologically and received greater market acceptance in the last few years in Kenya. The service, by its nature, has allowed users to transcend time and place, thus increasing accessibility and expanding both social and business networks (Palen 2002).Wireless communication promises to provide convenience, localization, and personalization of services (Carke 2001).The service is inexpensive because cabling is not needed (Agrawal,Chari,Sankar,2003).Other benefits to both service providers and clients include ;flexibility, lower support and maintenance costs, easier collaboration and improved business resilience (Cisco 2003).Major Mobile Money Players in Kenya include: Safaricom's M-PESA, Yu (YuCash), Orange (Orange Money), and Airtel (Airtel Money). However, M-PESA, Airtel Money and Orange Money remain the focus of our study with M-PESA as the most widely used mobile money service. During research we concentrated on what influences the poor to adopt the Mobile Money Transfer service by analyzing data obtained from clients and agents of the service.

One of the constantly developing fields of research is technology acceptance, as new technologies keep emerging or evolving all the time. There are two major disciplines that have immensely contributed to the development of models and theories addressing technology acceptance, adoption and usage. Psychology and Sociology focus on technology acceptance behavior, whereas Information Systems focuses on systems' characteristics in relation to technology acceptance. Our research puts into considerations contributions from the three fields; Pyschology, Sociology and Information Systems.

1.2 Problem Statement

Advances in Mobile Money Transfer technologies and utilization of mobile services by consumers have made mobile commerce market more user-friendly and more device- dependent. In Kenya for instance, the M-PESA network handles more transactions in a year than Western Union does globally, and the value of transactions represents more than 15% of Kenya's Gross Domestic Product (Kendall, Maurer, Machoka, and Veniard, 2011).Other Mobile Money Transfer Service providers have sprung to reduce the Safaricom's M-PESA market share but the Safaricom's M-PESA has remained dominant. This could be attributed to the fact that adoption of mobile money by the economically active poor has been spectacular. The reasons why Safaricom's M-PESA dominates the Mobile Money market across all users irrespective of social status including the poor, remain elusive yet transaction cost is nearly

the same across all service providers or slightly lower for some compared to M-PESA. Our research seeks to find out what influences the poor especially in adopting mobile money transfer service. The research will utilize Unified Theory of Acceptance and Use of Technology to facilitate understanding of what influences adoption of Mobile Money Transfer Service.

The Unified Theory of Acceptance and Use of Technology (UTAUT) provide great promise to enhance our understanding of adoption influencing factors of Mobile Money Transfer Service by the poor. Previous researches conducted with UTAUT consideration have focused on large organizations and whole population disregarding social status. Carlsson *et al.* (2006) carried out research aimed at examining the factors affecting the intention to use and factors affecting the use of mobile devices/services. The attitude towards using mobile device/ services and mobile device/services' anxiety were additionally examined as factors affecting behavioral intention and the use of mobile services apart from the original paths in UTAUT. Results obtained indicated that performance expectancy and effort expectancy had a strong direct effect on intention to use mobile devices and such an effect was weakened when attitude was added to the modified UTAUT model, which indicated that attitude explains part of the intention to use the mobile device. Social influences also had a significant positive crude effect on intention to use; however, the effect was not replicated in all previous models examined. Anxiety did not have a direct effect on intention to use but rather the influence was mediated by other variables such as performance expectancy and social influences. Attitude did not have a direct effect on intention to use which confirmed the original UTAUT model assumption that with presence of effort expectancy and performance expectancy, attitude would not have a direct effect on intention to use mobile device/service.

Furthermore, upon analyzing the actual use of three different mobile services, intention to use had a significant positive direct influence on the use of the studied services but when the model was adjusted for the other variables (EE, PE, FC, anxiety, and attitude) the direct effect of intention to use disappeared. These results tend to indicate the central part played by these variables in the influence of behavioral intention on the use of mobile services. Incorporating behavioral intention into the model would diminish the effect of independent variables on the use of mobile services (with one exception, that is, FC as the independent variable for one of the services studied, for instance, ring tones). Equally, facilitating conditions did not have a direct influence on the use of mobile services nor an indirect effect through behavioral intention. The results obtained do not support all cases the original UTAUT hypotheses and therefore there is need for modification or extension of the model used to account for the differences in the adoption behavior of the mobile devices and services (Carlsson *et al.*, 2006).

From the forgoing discussion, we utilized an extended UTAUT model that incorporates Transaction Cost as new determinant of adoption of Mobile Money Transfer Service by the poor, apart from Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions. Therefore our research will focus on two main questions:

- What is the role of transaction cost in adoption of Mobile Money Transfer Service by the poor?
- Does the extended UTAUT uphold in the context of the poor adapting Mobile Money Transfer Service?

1.3 Research Objectives

The objectives of our research will be to;

- Extend the UTAUT to account for the Mobile Money Transfer Service usage behavior among poor people.
- Examine the role of Transaction cost in explaining Mobile Money Adoption among the poor.
- Validate the extended UTAUT model.

1.4 Problem Justification

Mobile Money Transfer Service creates a platform for bringing together financial service providers and clients by providing them with a framework which they use to transact. However the poor rarely involve financial service providers in cash handling. This is because vast majority of the poor live in cash economy and whenever they work they are paid in cash. This could be attributed to high costs incurred when the poor attempt to transact through formal means such as banks. With advent of Mobile Money Transfer Service the poor seem to have adopted the service more than they have for any other financial service. Surprisingly one Mobile Money Transfer Service seems to dominate others despite the fact that Cost of Transactions is similar or slightly vary. M-PESA dominates the market of Mobile Money Transfer Service as though apart from cost of transaction, the poor people are influenced to adopt Mobile Money Transfer Service by some other factors. But Cost of Transaction should remain a significant factor if poor people are classified as poor basing on their levels of income.

Dense networks of transaction outlets where the poor work and live provided by Mobile Money Transfer Service reduce cost of accessing financial service. For example in Kenya, Safaricom's M-PESA has managed to create 70% of Kenyan households of which majority are poor people to the financial system. Furthermore using services provided by Mobile Money Transfer Service providers is deemed to require less effort but facilitate transfer of cash within shortest time compared to other forms of money transfer. The poor are excited by such flexible service and find no obstacle towards using the Mobile Money Transfer Service.

In the recent past Mobile Money Transfer Service providers have increased but still there is a huge variation in how their services are adopted even if they try to adjust transaction cost. This implies that adoption of Mobile Money Transfer Service by the poor is depended on a combination of factors rather than just dwelling on one. Therefore our research utilized extended Unified Theory of Acceptance and Use of Technology (UTAUT) model to enhance understanding of drivers of adoption of Mobile Money Transfer Service by the poor.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Information technology (IT) adoption by users is considered to be attributed to various influencing factors that are interrelated. Various models have been put forth to facilitate understanding of Information Technology (IT) adoption. In this chapter we will discuss the theoretical models and illustrate the key constructs of IT adoption that each model addresses.

2.2 Adoption Models

There are eight models considered for facilitating understanding of IT adoption as summarized in table 2.1.The models were developed as a result of studies about human behavior towards adoption and application of new innovations in day to day human activities. These models have evolved over the years and came as a result of persistent efforts of models' validation and extension that took place during the period each was presented. For instance, Psychology contributed the Theory of Reasoned Action, TRA (Ajzen and Fishbein, 1980), which was extended to the Theory of Planned Behavior, TPB (Ajzen,1985), which also had an extension, the Decomposed Theory of Planned Behaviour,DTPB (Taylor and Todd, 1995). Information Systems contributed the Technology Acceptance Model, TAM (Davis, 1986), which is an extension of Theory of Reasoned Action; yet also has an extension TAM2 (Venkatesh and Davis, 2000) and the Unified Theory of Acceptance and Use of Technology, UTAUT (Venkatesh et al., 2003), which is an aggregation of other models including the afore mentioned in addition to Rogers' Diffusion of innovations, DOI (1983), Bandura's Social Cognitive Theory, SCT (1989), Deci & Ryan's Motivational Model, MM (1985), and Triadis's Model of PC Utilization, MPCU (1979).

Table 2.1: Information Technology Adoption Models

Model	Abbreviation
1.The Theory of Reasoned Action	TRA
2.The Technology Acceptance Model	TAM/TAM2
3.The Motivation Model	MM
4.The Theory of Planned Behavior	TPB
5. A Combined Technology Acceptance Model/Theory of Planned Behavior.	C-TAM-TPB
6. The Model of PC Utilization.	MPCU
7. Innovation Diffusion Theory.	IDT
8.Social Cognitive Theory	SCT

Source: Venkatesh, *et al.*, "User Acceptance of Information Technology," 28-32.

2.2.1 The Theory of Reasoned Acton (TRA) Model

According to TRA an individual behaves in a manner which is in accordance with his or her intention to exhibit the behavior. The TRA model demonstrates that an Individual's Behavior (performance of a specified behavior) is driven by their Behavioral Intention to perform the behavior (Paul W. Williams, 2009). In turn, Behavioral Intention is driven by the person's Attitude towards a given Act or Behavior and their Subjective Norm.

Applied to adoption drivers of Mobile Money Transfer Service, TRA seems to maintain that, individuals would use the service if they could see that there would be positive benefits or outcomes associated with using service. The TRA model as depicted in figure 2.1, is a widely studied model from social psychology concerned with the determinants of consciously intended behaviors. However the model does not pay tribute to other adoption drivers such as facilitating conditions offered by new technology, performance expectancy and effort expectancy as well as cost. The model mostly attributes importance on social influence on intended behavior to adopt IT.

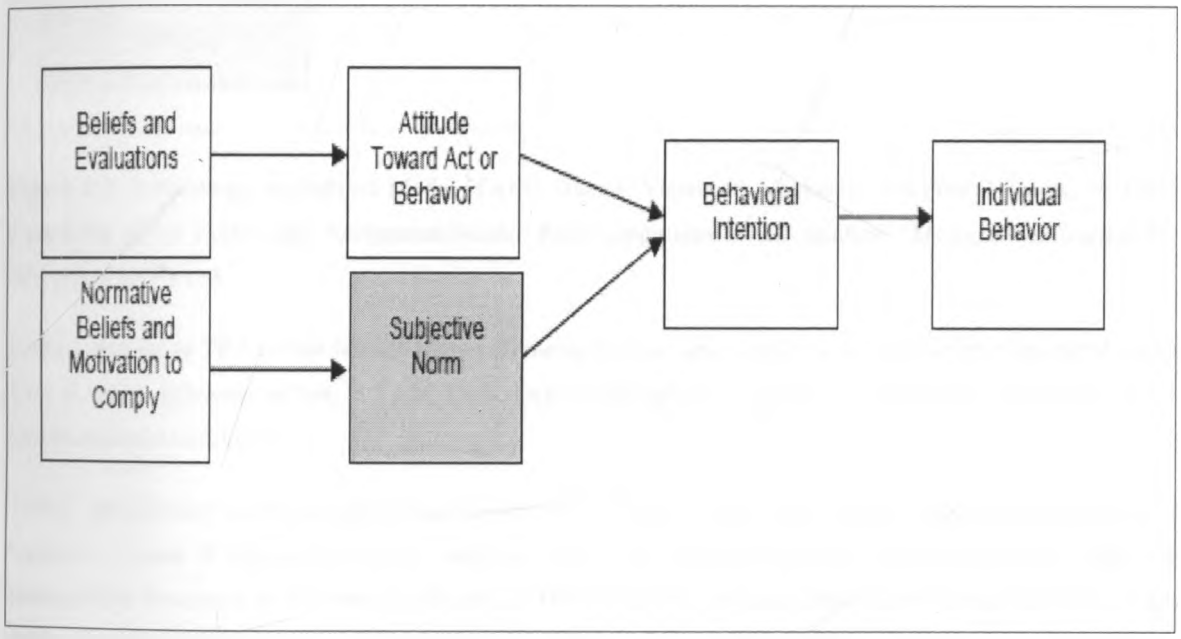


Figure 2.1: Theory of Reasoned Action Model. *Sources:* Fishbein and Ajzen, *Belief, Attitude, Intention, and behavior*; Davis, Bagozzi, and Warshaw, "User acceptance of computer technology," 984.

2.2.2 Technology Acceptance (TAM) Model

According to TAM, the effects of external variables such as System Characteristics and Developmental Process, and Training on Intention to Use are mediated by Perceived Usefulness and Perceived Ease of Use. Perceived usefulness and perceived ease of use are the two determinants that serve as a basis for attitude towards using a particular information system or adopting IT, which in turn determine the intention to use and then generate actual usage behavior (Marchewka, Liu and Kostiwa, 2009).Perceived ease of use refers to the extent to which a person believes that using new technology or system would be free from mental effort (Davis, 1989).Figure 2.2 illustrates the TAM model.

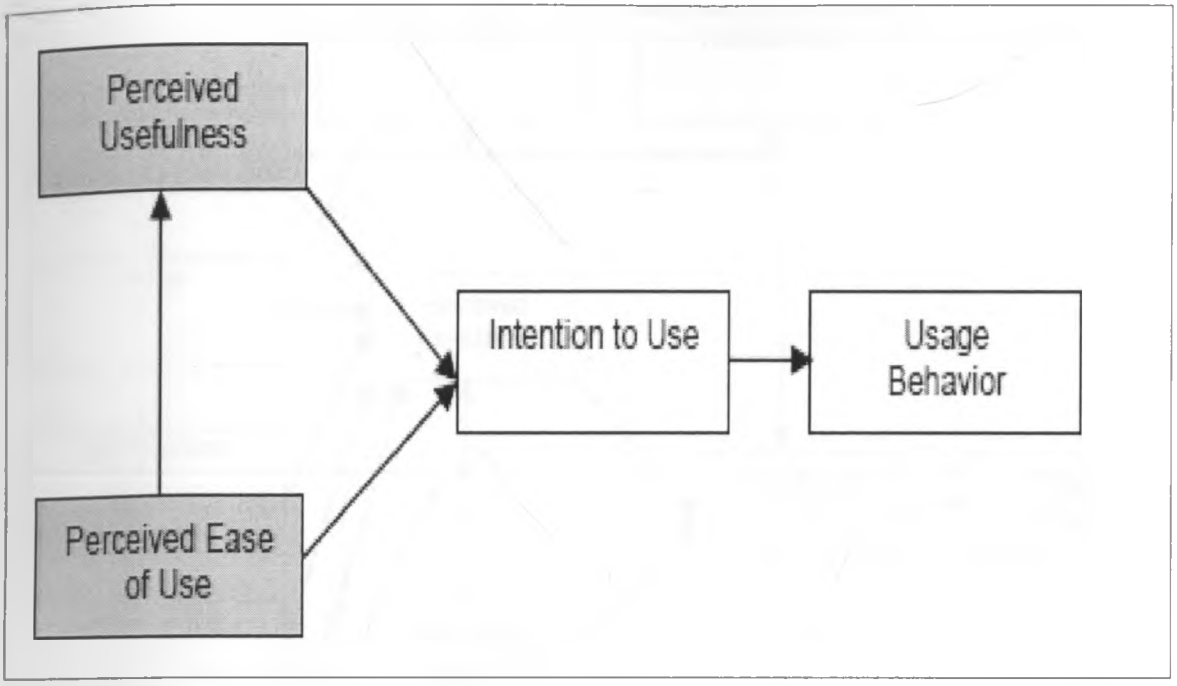


Figure 2.2: Technology Acceptance Model (TAM). *Source:* Viswanath Venkatesh and Fred D. Davis, "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, *"Management Science* 46, no. 2 (February 2000):188.

TAM is similar to TRA in that Mobile Money Transfer Service usage could be determined by Behavioral Intention to Use. A major difference is that, in TAM, Behavioral Intention to use is jointly determined by Perceived Ease of Use and Perceived Usefulness.

TAM2 incorporates additional theoretical constructs to TAM, which span social influence processes, to include Subjective Norm. It explains Perceived Usefulness and Usage Intentions in terms of Social Influence and Cognitive Instrumental Processes as illustrated by figure 2.3.The model was originally developed to examine IT/IS adoption by large business organization. Therefore there is need to explore the model's suitability for predicting general individual acceptance especially on adoption drivers in Mobile Money Transfer Service. A more comprehensive model that extends both TAM and TAM2 would be appropriate to enhance understanding of IT adoption drivers.

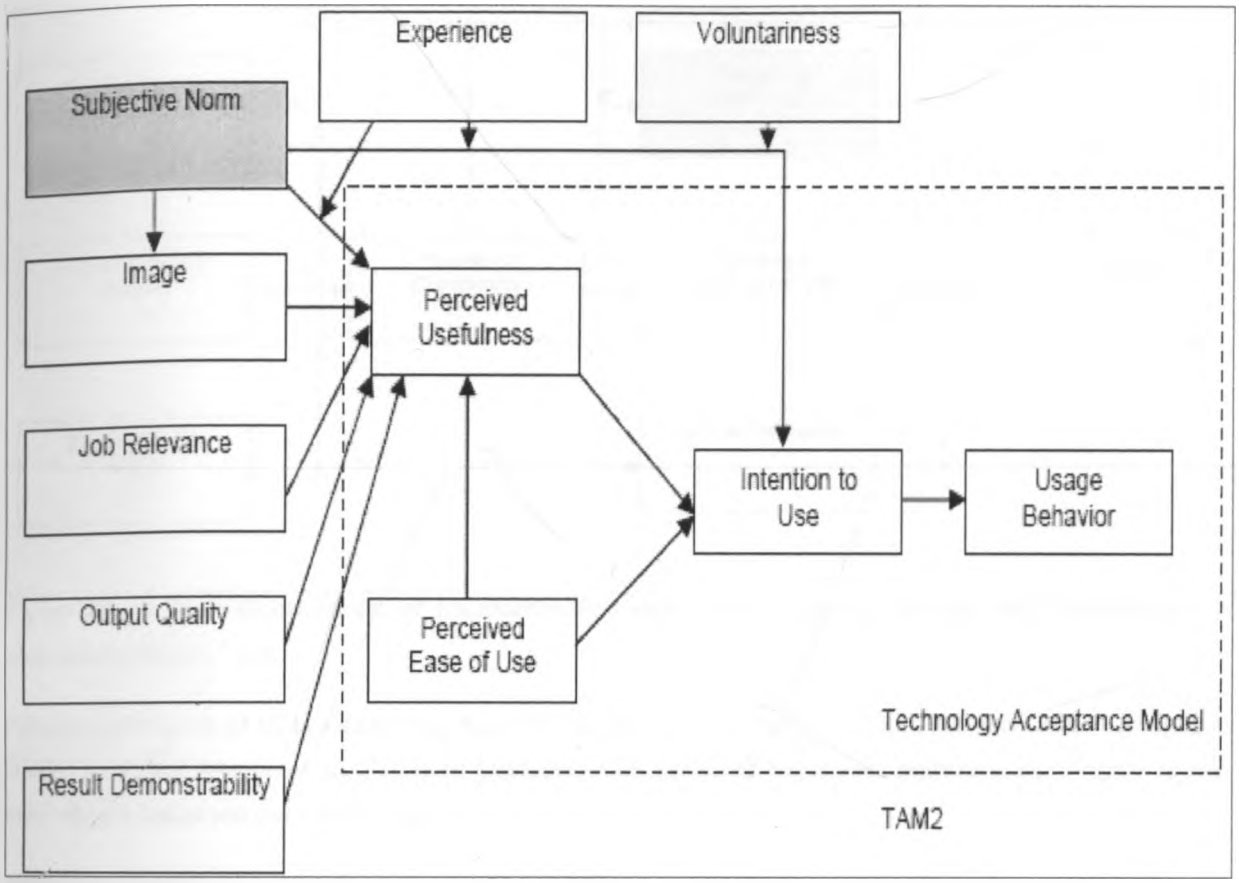


Figure 2.3: Technology Acceptance Model 2(TAM2) – An Extension of the Technology Acceptance Model. *Source:* Venkatesh and Davis, "A Theoretical Extension," 188.

2.2.3 The Motivational Model

The Motivation Models looks at IT adoption by people as driven by the usefulness of IT and enjoyment derived while using IT. It considers the usefulness as an extrinsic motivation and enjoyment as an intrinsic motivation. Figure 2.4 presents a 1996 motivational model specific to microcomputer usage prepared by Igbaria, Parasuraman, and Baroudi.

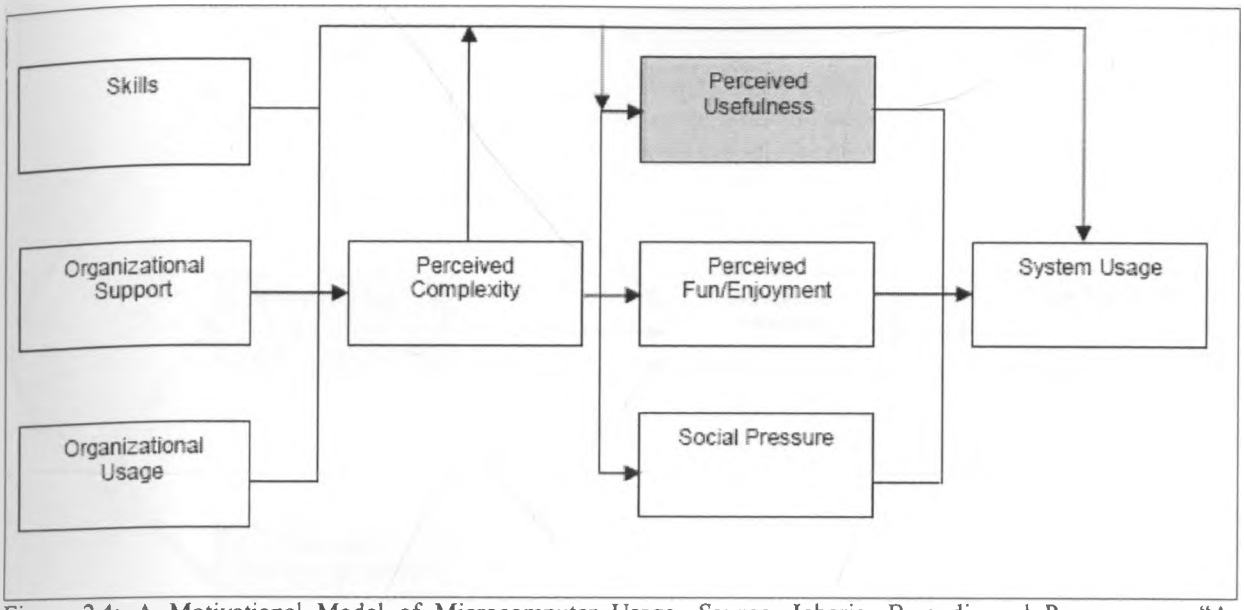


Figure 2.4: A Motivational Model of Microcomputer Usage. *Source:* Igbaria, Baroudi, and Parasuraman, "A Motivational Model," 130.

Perceived usefulness of IT as a motivating factor for adoption was derived from both TRA and TAM. According to Davis, *et al.* and Igbaria, *et al.*, Perceived Usefulness and Perceived Enjoyment contribute significantly to user motivation to adopt and use a technology.

Motivation Model only attributes importance on usefulness of technology and enjoyment derived from using technology as adoption drivers without considering other adoption drivers such as social influence.

2.2.4 Theory of Planned Behavior (TPB) Model

The Theory of Planned behavior asserts that individual behavior is driven by behavioral intentions. This could imply that an individual do not have a complete control of their behavior under certain conditions. Research conducted by Taylor and Todd concluded that, the intentions to perform behaviors, together with Perceived Behavioral Control, account for significant variance in actual behavior. Perceived Behavioral Control refers to the perceived ease or difficulty of performing or exhibiting behavior. Figure 2.5 illustrates Theory of Planned behavior.

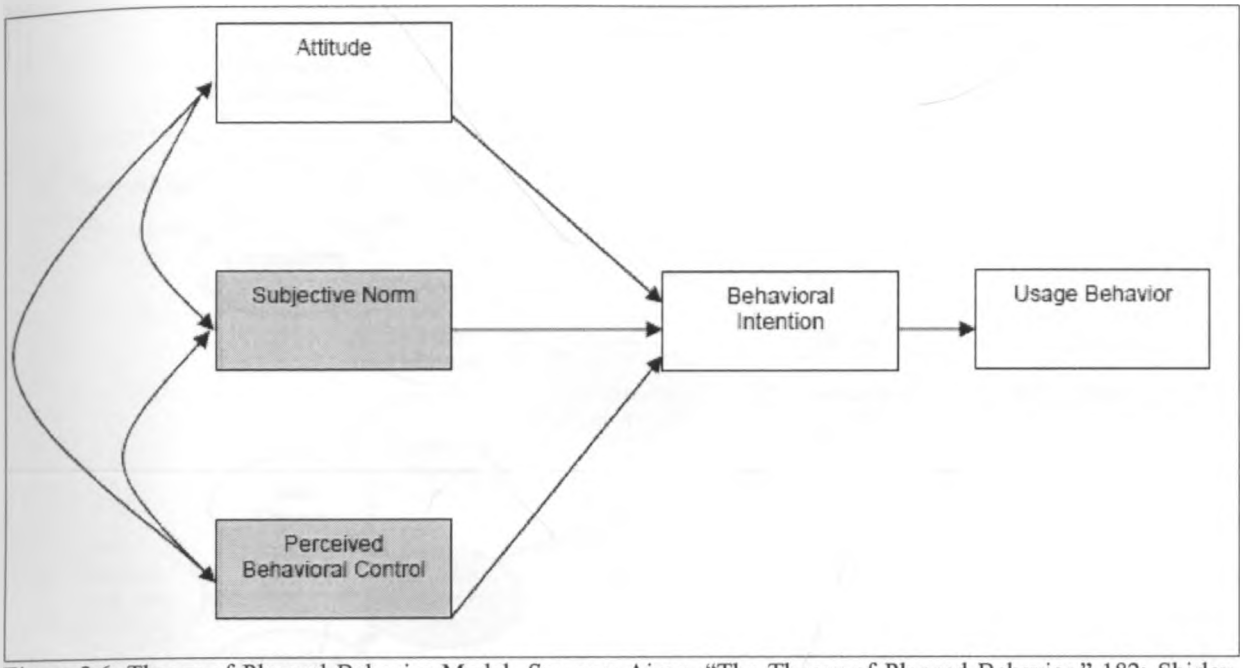


Figure 2.6: Theory of Planned Behavior Model. *Sources:* Ajzen, "The Theory of Planned Behavior," 182; Shirley Taylor and Peter A. Todd, "Understanding Information Technology Usage: A Test of Competing Models," *Information Systems Research* 6, no. 4 (1995): 146.

TPB focuses more on users' behavior towards adopting a system and does not consider design and implementation strategies of the system to be adopted. Another model that addresses this weakness of TPB is the Decomposed Theory of Planed Behavior (DTPB) Model.

DTPB aims to provide a more comprehensive understanding of Behavioral Intention through a focus on factors that are likely to influence systems use through the application of both design and implementation strategies. The model examines the dimensions of Subjective Norm and Perceived Behavioral Control by decomposing them into specific belief dimensions .The advantages of DTPB are similar to those of TAM including its capability to identify specific beliefs that may influence IT usage. Figure 2.6 illustrates DTPB model.

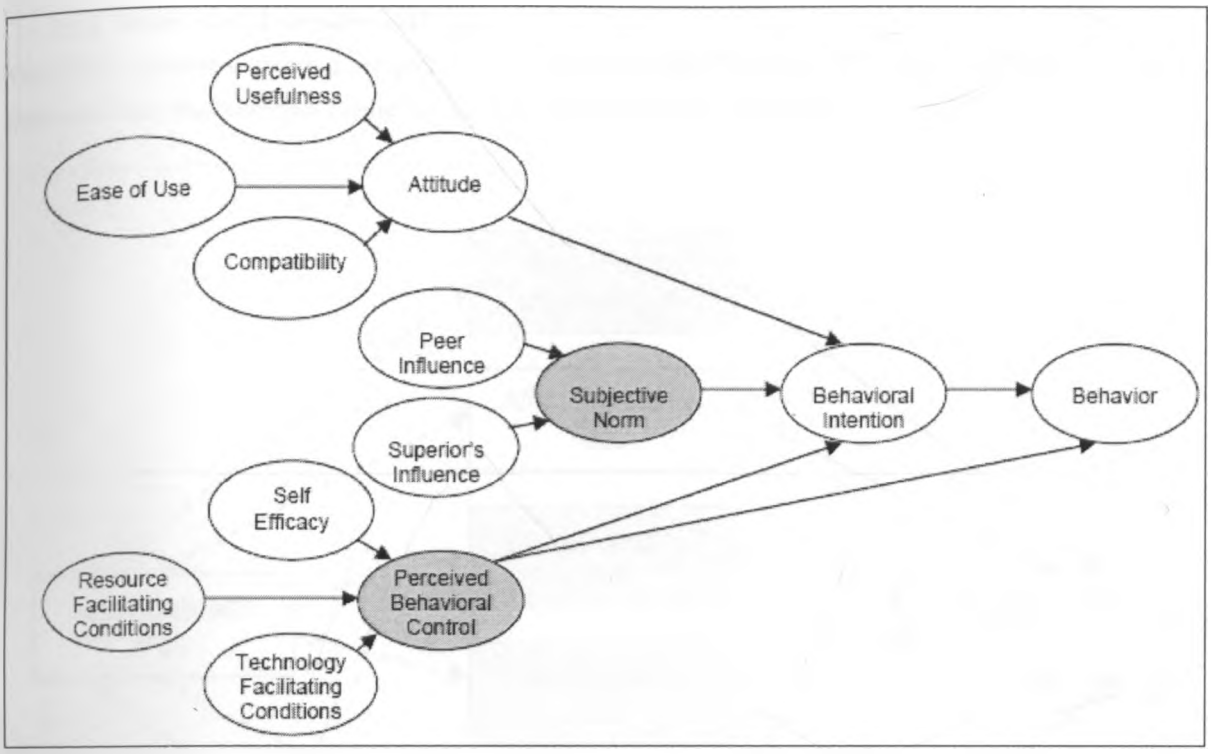


Figure 2.7: Decomposed Theory of Planned Behavior Model. *Source:* Taylor and Todd, "Understanding Information Technology Usage," 146.

DTPB seems to incorporate performance expectancy, social influence and facilitating conditions as adoption drivers influencing behavioral intention and usage behavior but it fails to exhaust considerations of effort expectancy influence on behavioral intention.

2.2.5 Combined TAM and TPB (C-TAM-TPB) model

This is a hybrid model developed to strengthen weakness of TAM and TPB while utilizing their advantages. However there are unique cases where Subjective Norms and Perceived Behavioral Control may operate differently in different settings. For example studies focusing on student environment could be different from that of workplace. Accordingly there seem to be no significant relationship between inexperienced and experienced users for the relationship Subjective Norm to Behavioral Intention and there seem to be no significant relationship between Perceived Usefulness to Attitude.

2.2.6 Model of PC Utilization (MPCU)

The MPCU presents competing perspective to proposals by both TAM and TPB. The model seeks to predict Use Behavior rather than Intention. Figure 2.8 illustrates the Model of PC utilization.

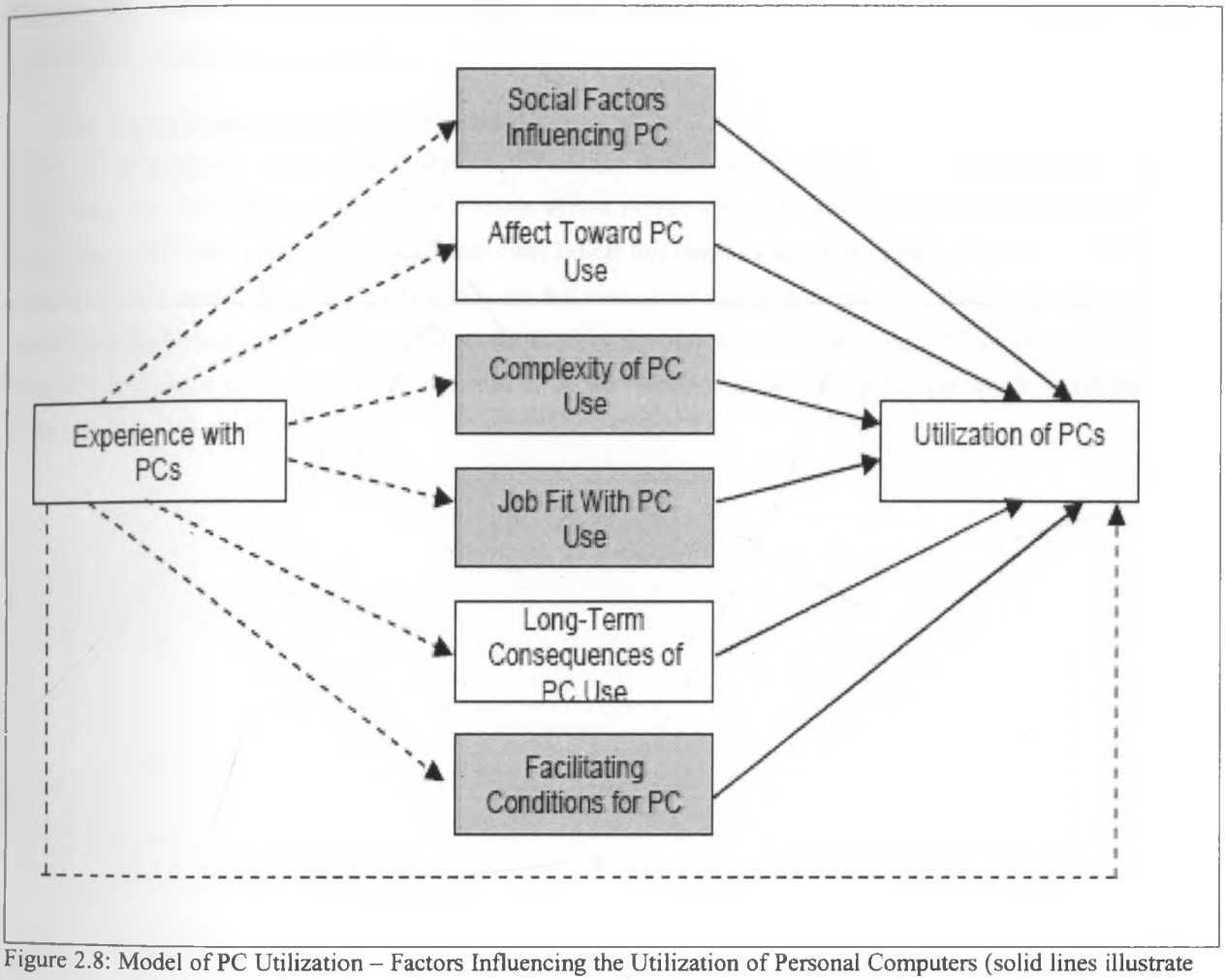


Figure 2.8: Model of PC Utilization – Factors Influencing the Utilization of Personal Computers (solid lines illustrate the original model – broken lines indicate Thompson *et al.*'s hypothesized direct and indirect influence of experience). *Source:* Thompson, Higgins and Howell, "Personal Computing," 172.

2.2.7 Innovation Diffusion Theory (IDT) Model

According to the IDT Model, there are five attributes of innovation that influence adoption namely;

- Compatibility: The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters.
- Complexity: The degree to which an innovation is perceived as difficult to understand and use.
- Observability: The degree to which the results of an innovation are visible to others.

- Relative Advantage: The degree to which an innovation is perceived as being better than its precursor.
- Trialability: The degree to which an innovation may be experimented with on a limited basis.

The model was developed to be used in terms of potential adopters use, trial or observation of the innovation rather than focusing on the innovation itself.

2.2.8 Social Cognitive Theory (SCT) Model

In the Social Cognitive Theory Model, Behavior; Personal, and Environmental influences operate interactively as determinants of each other. Whereas TAM focuses almost exclusively on Beliefs and Outcomes regarding studied technologies, SCT and TPB provide insight into other beliefs that might influence behavior, independent of perceived outcomes. The forgoing discussion tends to indicate that each model has its strengths and weaknesses. One would be forced to make tradeoffs while choosing the model to adopt for enhancing understanding of IT adoption. Perhaps the existence of a single model founded on strengths of all the discussed models would be appropriate to enhance our understanding of IT adoption.

CHAPTER 3

THE PROPOSED MODEL: EXTENDED UTAUT

3.1 Introduction

Venkatesh *et al.* (2003) proposed a more complete and comprehensive model for understanding the acceptance and adoption of Information Technology (IT).The model was founded on and extends beyond the well established Technology Acceptance Model (TAM).The new model for enhancing understanding of adoption drivers for Mobile Money Transfer Service among the poor is the extended Unified Theory of Acceptance and Use of Technology (UTAUT).

3.2 Genesis of proposed model

UTAUT was developed to consolidate TAM. According to TAM, beliefs about usefulness and ease of use are the primary determinants of Information Technologies adoption and therefore serve as a basis for attitudes towards using a particular system, which in turn influence the intention of use and generate the actual usage behavior. In the UTAUT model, performance expectancy and effort expectancy are considered to incorporate the constructs of perceived usefulness and ease of use in the original TAM study.

3.3 Description of UTAUT model

UTAUT considers four constructs hypothesized to have a significant role as direct determinants of user acceptance and usage behavior. The four constructs include; performance expectancy, effort expectancy, social influence and facilitating conditions. The constructs are moderated by age, gender, experience and voluntariness of use to determine user acceptance and usage behavior such that;

- The influence of performance expectancy on behavioral intention is considered to be moderated by gender and age such that the effect is stronger for men and particularly the younger men.
- The influence of effort expectancy on behavioral intention is considered to be moderated by age, gender and experience such that the effect is stronger for women, particularly the younger women and at early stages of experience.
- The influence of social influence on behavioral intention is considered to be moderated by age gender, experience and voluntariness of use such that the effect is stronger for women, particularly the older women in mandatory settings in early stages of experience.
- Facilitating conditions are considered not to have significant influence on behavioral intention.
- The influence of facilitating conditions on usage is considered to be moderated by age and experience such that the effect is stronger for older people, particularly with increasing experience.

- The influence of cost on usage behavior will be taken to be stronger among older people particularly with increasing experience.
- Behavioral intention is considered to have significant positive influence on usage.

Figure 3.1 illustrates how each of the four constructs is moderated by age, gender, experience and voluntariness of use. The arrows imply direct influence on the item they are directed to.

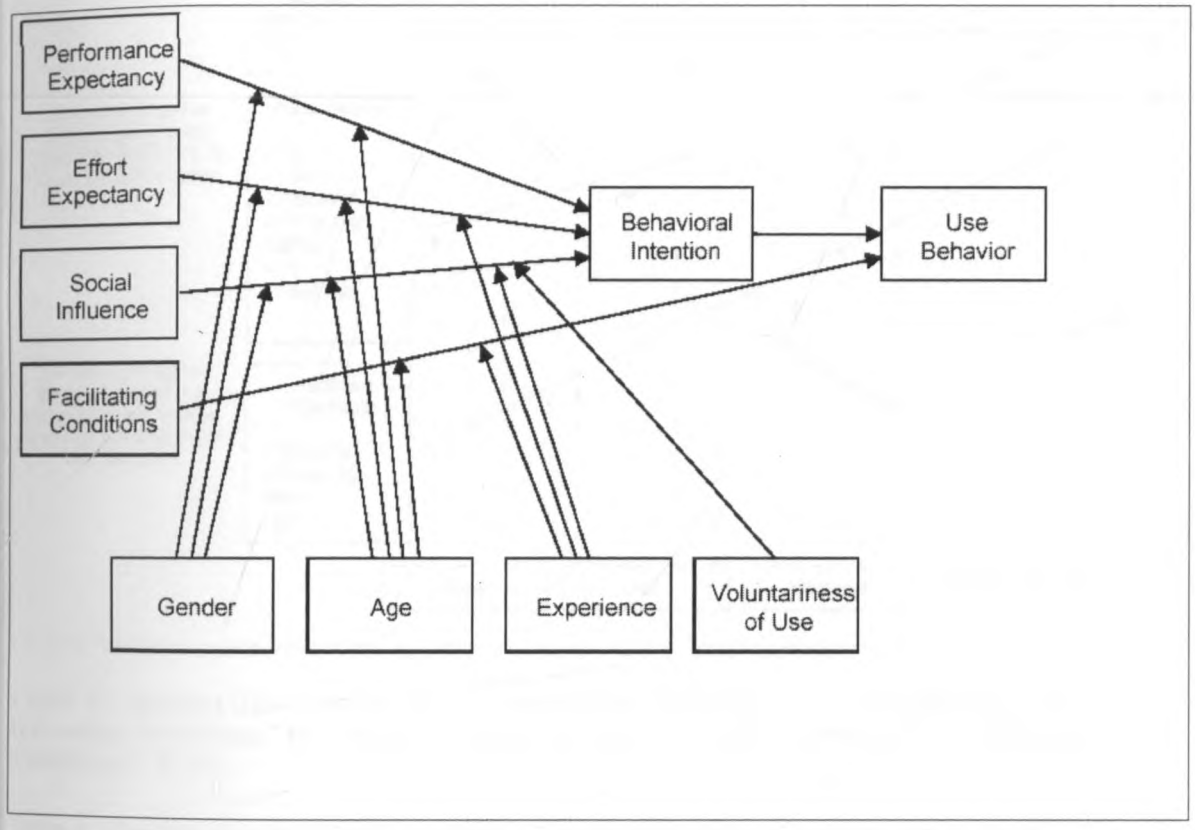


Figure 3.1: UTAUT Model.

Figure 3.2 gives a description of each of the four constructs that influence behavioral intentions and actual usage behavior. It further reveals that the four constructs were derived from previous models discussed in chapter 3.Therefore UTAUT model is a unification of previous models to generate a comprehensive model that facilitate in-depth understanding of IT adoption.

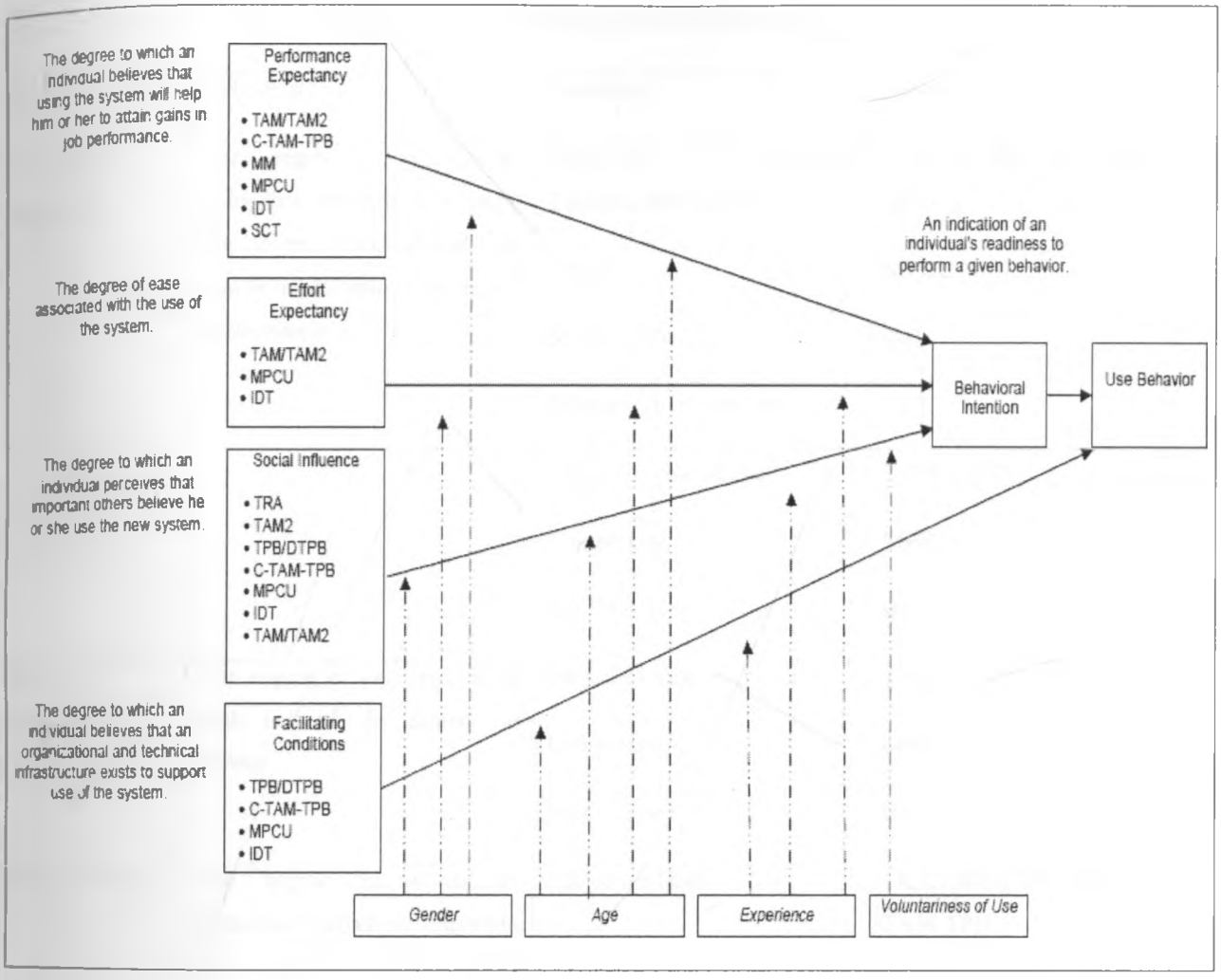


Figure 3.2: Modified UTAUT Model. *Sources:* Adapted from Venkatesh, et al., "User Acceptance of Information Technology," 447; Dasgupta, Granger, and McGarry, "User Acceptance of E-Collaboration Technology," 87-100.

Table 3.1illustrates how the UTAUT model was derived from previous models by putting all considerations of the previous models under a single model. For the purposes of our study we will consider transaction cost as a determinant for use behavior. We intend to find out how transaction cost influence use behavior especially while adopting Mobile Money Transfer System. Transaction cost may closely influence use behavior since, as much as the poor may belief in the technical infrastructure to safeguard his or her money while transacting, an important question would be whether she or he can afford the service especially when more technical features attract more cost.

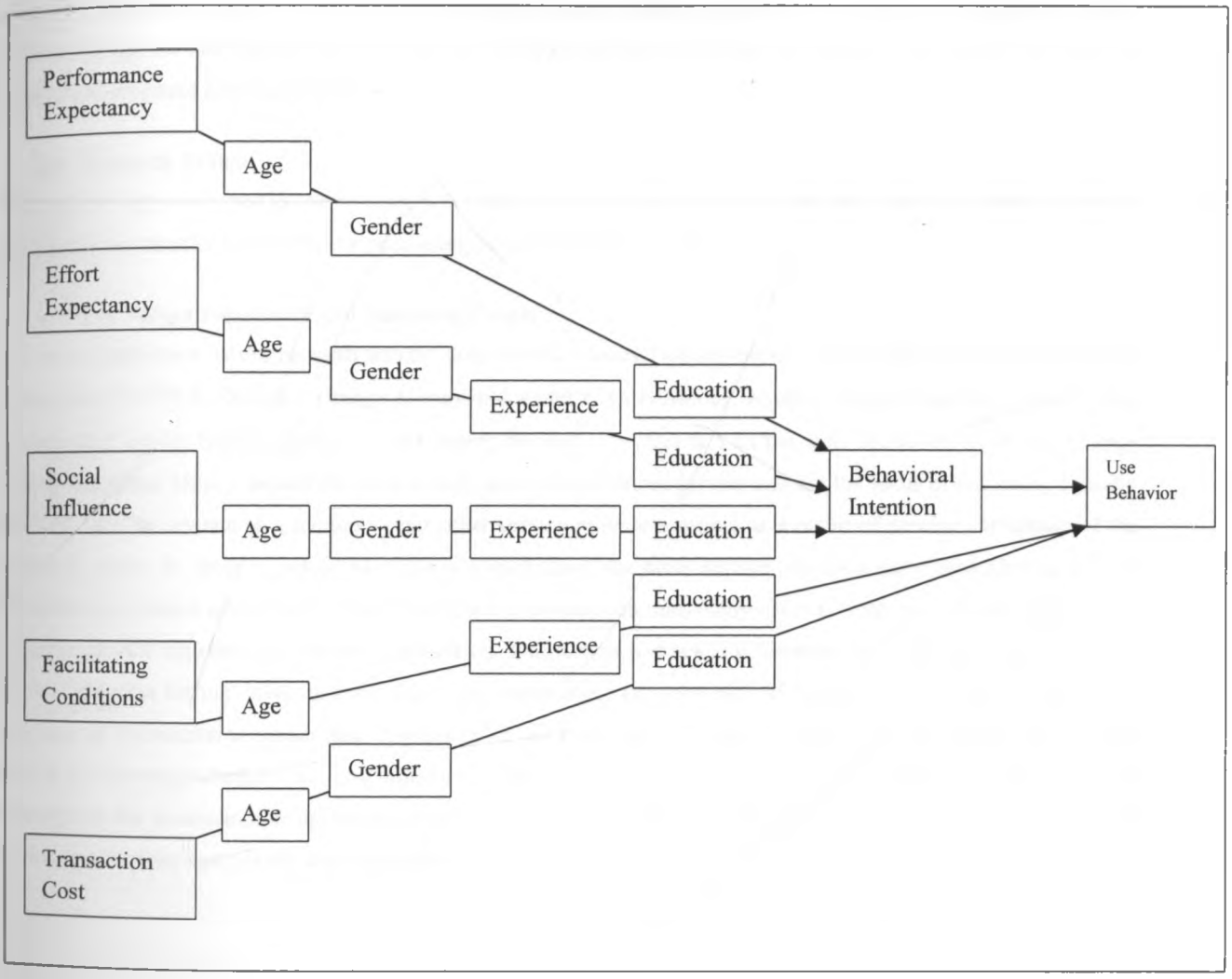
Table 3.1: UTAUT Variables, Corresponding Models, Constructs and Definitions

UTAUT Variable	Definition	Construct	Model
Performance Expectancy	The degree to which an individual believes that using the system or service will help him or her to attain gains in job performance.	Perceived Usefulness	C-TAM-TPB,TAM/TAM2
		Extrinsic Motivation	MM
		Job Fit	MPCU
		Relative Advantage	IDT
		Outcome, Expectations	SCT
		Perceived Ease of Use	TAM/TAM2
		Complexity	MPCU
		Ease of Use	IDT
Effort Expectancy	The degree of ease associated with use of the system or service	Perceived Ease of Use	TAM/TAM2
		Complexity	MPCU
		Ease of Use	IDT
Social Influence	The degree to which an individual perceives important others believes he or she should use the system.	Subjective Norm	TRA,TAM2,TPB,DTPB,C-TAM-TPB
		Social Factors Image	MPCU,IDT
Facilitating Conditions	The degree to which an individual believes an organizational and technical infrastructure exists to support use of system or service.	Perceived Behavioral Control	TPM,DTPB
		Facilitating Conditions	MPCU
		Compatibility	IDT

Source: Adapted from Venkatesh, et al., "User Acceptance of Information Technology," 448-454.

Figure 3.3 illustrates the proposed Extended UTAUT model to include Transaction Cost as a determinant of Use Behaviour.The influence of Transaction Cost will be mediated by age, gender and education. Such influence will not be considered to have effect on intended behavior as the effect is felt upon use of the Mobile Money Transfer Service.

Figure 3.3 The Proposed Extended UTAUT model



3.4 Reliability and Validity of the Model

UTAUT model account for nearly 70 percent of variance in usage intention better than TAM studies alone (Marchewka,Liu and Kostiwa,2007).The model therefore provides great promise to enhance understanding for technology acceptance, even though its previous researches were mostly based on large organizations. The model is verified by considering measurements and analyses of Venkatesh *et al* (2003) in terms of reliability, means, standard deviations, correlations and structural equation modeling.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

The main objective of our research was to investigate drivers of adoption of Mobile Money Transfer Service with regard to the poor people since they constitute large percentage of the population especially in developing countries such as Kenya. In this chapter we describe the methodology and tools used to conduct our research in order to validate the proposed adoption model.

4.2 Research Design

The methodology employed in our research was mainly survey in order to investigate and analyze adoption drivers of Mobile Money transfer Service by the poor using extended UTAUT model.

4.3 The Target Population and Sampling Frame

The target population for our research was the poor Mobile Money Transfer Service subscribers and dealers/agents of Safaricom's M-PESA, Orange's Orange Money and Airtel's Airtel Money. Another mobile operator in Kenya that has launched similar mobile money services during the past two years is Yu (YuCash). However, M-PESA, Orange Money and Airtel Money remain the most widely used mobile money service and are the focus of our study. Initially M-PESA used to operate as a monopoly but other service providers sprung as a result of spectacular uptake of the service by users. In order to reduce M-PESA's market share, the other service providers have been altering cost of transactions to attract subscribers. This is attributed to assumption that, many users and the poor in particular would adopt the service with the lowest cost of transaction. Transaction cost is a key determinant of Mobile Money Transfer Service adoption for our investigations. Table 4.1 summarizes how the Mobile Money Transfer Service providers vary cost of transaction to attract their customers. In our study we will keenly evaluate cost of transaction for each service provider and whether it has any influence on the poor when they are deciding which service to adopt. We also investigated the moderators or mediators of cost of transaction's effect on intention to adopt a given service. Such moderators include; age, gender and experience.

Table 4.1.Cost of Transaction for different Mobile Money Transfer Service Providers

SERVICE PROVIDER'S PRODUCT	TRANSACTION TYPE	TRANSACTION AMOUNT(KES) MAXIMUM	TRANSACTION AMOUNT(KES) MINIMUM	TRANSACTION FEE(KES)
ORANGE MONEY	CASH DEPOSIT	100	35000	FREE
	SEND MONEY TO REGISTERED USER	100.00	35,000.00	30.00
	SEND MONEY TO NONREGISTERED USER	100.00	35,000.00	30.00
	WITHDRAWAL BY A REGISTERED USER	100.00	2,500.00	25.00
	WITHDRAWAL BY A NONREGISTERED USER	100.00	2,500.00	40.00
SAFARICOM-MPESA	CASH DEPOSIT	50	70000	FREE
	SEND MONEY TO REGISTERED USER	50.00	100.00	10.00
		101.00	35,000.00	30.00
	SEND MONEY TO NONREGISTERED USER	100.00	2,500.00	70.00
	WITHDRAWAL BY A REGISTERED USER	50.00	100.00	15.00
		101.00	2,500.00	25.00
	WITHDRAWAL BY A NONREGISTERED USER	100.00	35,000.00	**0.00**
AIRTEL MONEY	CASH DEPOSIT	50	70,000.00	FREE
	SEND MONEY TO AIRTEL USER	50.00	100.00	5.00
		101.00	70,000.00	25.00
	SEND MONEY TO NONAIRTEL USER	101.00	35,000.00	25.00
	WITHDRAWAL	50.00	100.00	15.00
		101.00	1,000.00	25.00

4.4 Estimated Sample Size for subscribers and Agents

Since the targeted Mobile Money Transfer Service Provides, that is, Safaricom, Airtel and Orange Telkom operate in Kenya; our sample was based on population of service subscribers and agents in Kenya, particularly in Nairobi. According to 2009 census report only 3.6% of the number of households own at least one computer compared to 63.3% of households who own mobile phone in Kenya. Table 4.2 gives a summary of distribution of households with communication facilities. For purposes of our study, we will restrict ourselves to distribution of Mobile Phones in Nairobi estimated at 870,163 households with Mobile Phones compared to 5,538,689 households with Mobile Phones Nationwide.

Table 4.2: Number and % of Households

	Mobile Phone	%	Landline Telephone	%	Computer	%
KENYA	5,538,689	63.2	105,367	1.2	311,543	3.6
NAIROBI	870,163	88.3	44,834	4.6	131,524	13

Source: UNEP (2006). *Nairobi City Environment Outlook.* United Nations Environment Programme (UNEP), Nairobi.

Nairobi has 8 administrative divisions which contain sub-division or locations as indicated in table 4.3.Belonging to the divisions are sub-locations to which 108 areas belong. The areas are classified into five levels ranging from 1 to 5 according to socio-economic status by the Kenya National Bureau of Statistics (KNBS).52 areas of the 108 areas are regarded as having poor people .the 108 areas are summarized by table 4.4

Table 4.3: Divisions and subdivisions of Nairobi

Division	Subdivision	Division	Subdivision
Central	Huruma	Kasarani	Githurai
	Kariokor		Kahawa
	Mathare		Kariobangi -North
	Ngara		Kasarani
	Starehe		Korogocho
	Dagoretti		Roysambu
	Kawangware		Ruaraka
	Kenyatta/Golf Club		
	Mutuini		
	Riruta		
	Uthiru/Ruthmitu		
	Waithaka		
Embakasi	Dandora	Dagoretti	Kangemi
	Embakasi		Kawangware
	Kariobangi South		Mutuini
	Kayole		Riruta
	Mukuru Kwa Njenga		Waithaka
	Njiru		
	Ruai		
	Umoja		

Division	Subdivision	Division	Subdivision
Makadara	Makadara	Westlands	Highridge
	Makongeni		Kangemi
	Maringo		Kilimani
	Mukuru Nyayo		Kitisuru
	Viwandani		Lavington
			Parklands
Kibera	Karen	Pumwani	Bahati
	Kibera		Eastleigh North
	Laini Saba		Eastleigh South
	Langata		Kamukunji
	Mugumoini		Pumwani
	Nairobi West		
	Sera Ngombe		

Source: UNEP (2006). *Nairobi City Environment Outlook.* United Nations Environment Programme (UNEP), Nairobi

Table 4.4: Nairobi areas ranging from level 1 to 5 (classified according to socio-economic status)

NUMBER	DIVISION	LOCATION/ SUB-DIVISION	SUB-LOCATION	EANAME	LEVEL
1	KASARANI	ROYSAMBU	ROYSAMBU	MARURUI 'A'	1
2	KASARANI	ROYSAMBU	ROYSAMBU	THOME 1 & EVANGEL HOUSE	1
3	KASARANI	ROYSAMBU	ROYSAMBU	THOME V	1
4	WESTLANDS	PARKLANDS	UPPER PARKLANDS	PARKLANDS	1
5	WESTLANDS	PARKLANDS	SPRING VALLEY	SPRING VALLEY	1
6	WESTLANDS	PARKLANDS	SPRING VALLEY	SPRING VALLEY	1
7	WESTLANDS	KITISURU	LORESHO	LORESHO SOUTH	1
8	WESTLANDS	KITISURU	KYUNA	KYUNA ESTATE	1
9	WESTLANDS	KITISURU	KITISURU	LOWER KABETE	1
10	WESTLANDS	HIGHRIDGE	MUTHAIGA	MUTHAIGA (UBALOZI)	1
11	WESTLANDS	HIGHRIDGE	MUTHAIGA	MUTHAIGA (GOLF CLUB)	1
12	WESTLANDS	HIGHRIDGE	KARURA	KARURA	1
13	WESTLANDS	HIGHRIDGE	KARURA	KARURA	1
14	WESTLANDS	KANGEMI	MOUNTAIN VIEW	MOUNTAIN VIEW	1
15	WESTLANDS	LAVINGTON	MUTHANGARI	MUTHANGARI	1
16	WESTLANDS	LAVINGTON	MUTHANGARI	MUTHANGARI	1

NUMBER	DIVISION	LOCATION/ SUB-DIVISION	SUB-LOCATION	EANAME	LEVEL
17	WESTLANDS	LAVINGTON	MUTHANGARI	RIVERSIDE PARK	1
18	WESTLANDS	LAVINGTON	MAZIWA	CHAMBI DRIVE 'A'&'B'	1
19	WESTLANDS	LAVINGTON	MAZIWA	RUSINGA	1
20	WESTLANDS	LAVINGTON	MAZIWA	RIARA	1
21	KIBERA	LANGATA	LANGATA	RIVER BANK	1
22	KIBERA	LANGATA	HARDY	HARDY ESTATE	1
23	KIBERA	LANGATA	HARDY	HARDY ESTATE	1
24	KIBERA	LANGATA	HARDY	HARDY ESTATE	1
25	KIBERA	KAREN	KAREN	WINDYRIGE	1
26	KIBERA	KAREN	KAREN	COLLEGE	1
27	KIBERA	KAREN	LENANA	MIOTONI RIVER	1
28	KIBERA	KAREN	LENANA	NANDI	1
29	KASARANI	ROYSAMBU	GARDEN	GARDEN	2
30	WESTLANDS	KITISURU	KYUNA	KIBANGARE	2
31	WESTLANDS	HIGHRIDGE	HIGHRIDGE	HIGHRIDGE	2
32	WESTLANDS	HIGHRIDGE	HIGHRIDGE	HIGHRIDGE	2
33	WESTLANDS	HIGHRIDGE	HIGHRIDGE	HIGHRIDGE	2
34	WESTLANDS	HIGHRIDGE	HIGHRIDGE	HIGHRIDGE	2
35	WESTLANDS	KILIMANI	KILIMANI	KILIMANI	2
36	WESTLANDS	KILIMANI	KILIMANI	KILIMANI	2
37	WESTLANDS	KILIMANI	KILIMANI	KILIMANI	2
38	WESTLANDS	KILIMANI	KILIMANI	KILIMANI	2
39	WESTLANDS	KILIMANI	KILELESHWA	KILIMAMBOGO	2
40	WESTLANDS	KILIMANI	KILELESHWA	HAMISI	2
41	CENTRAL	KARIOKOR	ZIWANI/KARIOKOR	RACE COURCE	3
42	MAKADARA	MAKADARA	HAMZA	MARTIN LUTHER	3
43	MAKADARA	MUKURU NYAYO	HAZINA	HAZINA ESTATE	3
44	KASARANI	KAHAWA	KIWANJA	KENYATTA UNIVERSITY	3
45	KASARANI	GITHURAI	GITHURAI	ZIMMERMAN	3
46	KASARANI	KASARANI	MWIKI	KARURA	3
47	KASARANI	KASARANI	KASARANI	KASARANI	3
48	EMBAKASI	MUKURU KWANJENGA	MUKURU KWANJENGA	MUKURU KWANJENGA	3
49	EMBAKASI	UMOJA	UMOJA	UMOJA MARKET	3
50	EMBAKASI	KAYOLE	KOMAROCK	KOMAROCK	3
51	EMBAKASI	RUAI	RUAI	BONDENI	3
52	PUMWANI	BAHATI	UHURU	BURUBURU PHASE 1	3
53	DAGORETTI	KENYATTA/GOLF CLUB	KENYATTA	UPPER HILL	3
54	KIBERA	MUGUMOINI	MUGUMOINI	SOUTHLANDS	3

NUMBER	DIVISION	LOCATION/ SUB-DIVISION	SUB-LOCATION	EANAME	LEVEL
55	KIBERA	MUGUMOINI	MUGUMOINI	MUGUMOINI	3
56	KIBERA	NAIROBI WEST	SOUTH 'C'	SOUTH 'C'	3
57	CENTRAL	KARIOKOR	PANGANI	CHAI ROAD	4
58	CENTRAL	MATHARE	MLANGO KUBWA	KAMWINGI	4
59	CENTRAL	HURUMA	HURUMA	HURUMA	4
60	CENTRAL	HURUMA	HURUMA	HURUMA	4
61	MAKADARA	MAKONGENI	MAKONGENI	MAKONGENI	4
62	MAKADARA	MAKADARA	HARAMBEE	JERICHO	4
63	MAKADARA	MARINGO	OFAFA MARINGO	OFAFA I	4
64	KASARANI	KARIOBANGI	KARIOBANGI NORTH	MARURA	4
65	KASARANI	KARIOBANGI	BABA DOGO	KASABUNI	4
66	KASARANI	KOROGOCHO	GITATHURU	NGUNYUMU VILLAGE	4
67	KASARANI	GITHURAI	GITHURAI	GITHURAI	4
68	KASARANI	RUARAKA	UTALII	UTALII	4
69	KASARANI	RUARAKA	MATHARE NORTH	MATHARE NORTH	4
70	KASARANI	RUARAKA	MATHARE NORTH	MATHARE NORTH	4
71	EMBAKASI	MUKURU KWANJENGA	MUKURU KWANJENGA	MUKURU KWANJENGA	4
72	EMBAKASI	UMOJA	UMOJA	UMOJA II	4
73	EMBAKASI	UMOJA	SAVANNAH	MUTHAIGA	4
74	EMBAKASI	KAYOLE	KAYOLE	KAYOLE	4
75	EMBAKASI	KAYOLE	KAYOLE	KAYOLE	4
76	EMBAKASI	KAYOLE	KAYOLE	KAYOLE	4
77	EMBAKASI	DANDORA	DANDORA 'A'	DANDORA PHASE I	4
78	EMBAKASI	DANDORA	DANDORA 'A'	DANDORA PHASE II	4
79	EMBAKASI	DANDORA	DANDORA 'B'	PHASE III	4
80	EMBAKASI	DANDORA	DANDORA 'B'	PHASE IV	4
81	EMBAKASI	KARIOBANGI SOUTH	KARIOBANGI NORTH	JUA KALI	4
82	PUMWANI	EASTLEIGH NORTH	AIRBASE	SECTION II	4
83	PUMWANI	EASTLEIGH NORTH	EASTLEIGH NORTH	EASTLEIGH NORTH	4
84	PUMWANI	EASTLEIGH SOUTH	EASTLEIGH SOUTH	EASTLEIGH SOUTH	4
85	PUMWANI	BAHATI	UHURU	OUTER RING ESTATE	4
86	WESTLANDS	KANGEMI	GICHAGI	GICHAGI	4
87	WESTLANDS	KANGEMI	KANGEMI	MARENGA	4
88	WESTLANDS	KANGEMI	KANGEMI	WARUKU	4
89	DAGORETTI	MUTUINI	KIRIGU	SAIGONI 'A'	4
90	DAGORETTI	RIRUTA	RIRUTA	RIRUTA SATELLITE	4
91	DAGORETTI	RIRUTA	NGANDO	DAGORETTI	4
92	KIBERA	LAINI SABA	NYAYO HIGHRISE	HIGHRISE	4
93	CENTRAL	MATHARE	MATHARE	VILLAGE 2	5

NUMBER	DIVISION	LOCATION/ SUB-DIVISION	SUB-LOCATION	EANAME	LEVEL
94	CENTRAL	HURUMA	KIA MAIKO	KIA MAIKO	5
95	MAKADARA	VIWANDANI	VIWANDANI	LUNGA LUNGA	5
96	KASARANI	KARIOBANGI	BABA DOGO	BABA DOGO I	5
97	KASARANI	KOROGOCHO	NYAYO	HIGH-RIDGE	5
98	EMBAKASI	MUKURU KWANJENGA	MUKURU KWANJENGA	MUKURU KWANJENGA	5
99	EMBAKASI	NJIRU	MAILI SABA	MAILI SABA	5
100	PUMWANI	PUMWANI	MAJENGO	MAJENGO	5
101	DAGORETTI	UTHIRU/RUTHIMITU	UTHIRU	UTHIRU 87/MUTHWA	5
102	DAGORETTI	KAWANGWARE	KAWANGWARE	CENTRE/CIUGUINI	5
103	DAGORETTI	KAWANGWARE	GATINA	KAMITHA	5
104	KIBERA	KIBERA	KIBERA	KAMBI MURU	5
105	KIBERA	KIBERA	SILANGA	SILANGA	5
106	KIBERA	MUGUMOINI	BOMAS	QUARRY VILLAGE	5
107	KIBERA	LAINI SABA	NYAYO HIGHRISE	KIBERA	5
108	KIBERA	SERA NGOMBE	OLYMPIC	SOWETO	5

Source:KNBS

From table 4.4 we obtain table 4.5 with only areas ranging from level 4 to 5, they harbor the target population for our study.

Table 4.5: Sampling Frame (52 areas with poor people in Nairobi)

NUMBER	DIVISION	LOCATION/ SUB-DIVISION	SUB-LOCATION	EANAME	LEVEL
1	CENTRAL	KARIOKOR	PANGANI	CHAI ROAD	4
2	CENTRAL	MATHARE	MLANGO KUBWA	KAMWINGI	4
3	CENTRAL	HURUMA	HURUMA	HURUMA	4
4	CENTRAL	HURUMA	HURUMA	HURUMA	4
5	MAKADARA	MAKONGENI	MAKONGENI	MAKONGENI	4
6	MAKADARA	MAKADARA	HARAMBEE	JERICHO	4
7	MAKADARA	MARINGO	OFAFA MARINGO	OFAFA I	4
8	KASARANI	KARIOBANGI	KARIOBANGI NORTH	MARURA	4
9	KASARANI	KARIOBANGI	BABA DOGO	KASABUNI	4
10	KASARANI	KOROGOCHO	GITATHURU	NGUNYUMU VILLAGE	4
11	KASARANI	GITHURAI	GITHURAI	GITHURAI	4
12	KASARANI	RUARAKA	UTALII	UTALII	4
13	KASARANI	RUARAKA	MATHARE NORTH	MATHARE NORTH	4
14	KASARANI	RUARAKA	MATHARE NORTH	MATHARE NORTH	4
15	EMBAKASI	MUKURU KWANJENGA	MUKURU KWANJENGA	MUKURU KWANJENGA	4

NUMBER	DIVISION	LOCATION/ SUB-DIVISION	SUB-LOCATION	EANAME	LEVEL
16	EMBAKASI	UMOJA	UMOJA	UMOJA II	4
17	EMBAKASI	UMOJA	SAVANNAH	MUTHAIGA	4
18	EMBAKASI	KAYOLE	KAYOLE	KAYOLE	4
19	EMBAKASI	KAYOLE	KAYOLE	KAYOLE	4
20	EMBAKASI	KAYOLE	KAYOLE	KAYOLE	4
21	EMBAKASI	DANDORA	DANDORA 'A'	DANDORA PHASE I	4
22	EMBAKASI	DANDORA	DANDORA 'A'	DANDORA PHASE II	4
23	EMBAKASI	DANDORA	DANDORA 'B'	PHASE III	4
24	EMBAKASI	DANDORA	DANDORA 'B'	PHASE IV	4
25	EMBAKASI	KARIOBANGI SOUTH	KARIOBANGI NORTH	JUA KALI	4
26	PUMWANI	EASTLEIGH NORTH	AIRBASE	SECTION II	4
27	PUMWANI	EASTLEIGH NORTH	EASTLEIGH NORTH	EASTLEIGH NORTH	4
28	PUMWANI	EASTLEIGH SOUTH	EASTLEIGH SOUTH	EASTLEIGH SOUTH	4
29	PUMWANI	BAHATI	UHURU	OUTER RING ESTATE	4
30	WESTLANDS	KANGEMI	GICHAGI	GICHAGI	4
31	WESTLANDS	KANGEMI	KANGEMI	MARENGA	4
32	WESTLANDS	KANGEMI	KANGEMI	WARUKU	4
33	DAGORETTI	MUTUINI	KIRIGU	SAIGONI 'A'	4
34	DAGORETTI	RIRUTA	RIRUTA	RIRUTA SATELLITE	4
35	DAGORETTI	RIRUTA	NGANDO	DAGORETTI	4
36	KIBERA	LAINI SABA	NYAYO HIGHRISE	HIGHRISE	4
37	CENTRAL	MATHARE	MATHARE	VILLAGE 2	5
38	CENTRAL	HURUMA	KIA MAIKO	KIA MAIKO	5
39	MAKADARA	VIWANDANI	VIWANDANI	LUNGA LUNGA	5
40	KASARANI	KARIOBANGI	BABA DOGO	BABA DOGO I	5
41	KASARANI	KOROGOCHO	NYAYO	HIGH-RIDGE	5
42	EMBAKASI	MUKURU KWANJENGA	MUKURU KWANJENGA	MUKURU KWANJENGA	5
43	EMBAKASI	NJIRU	MAILI SABA	MAILI SABA	5
44	PUMWANI	PUMWANI	MAJENGO	MAJENGO	5
45	DAGORETTI	UTHIRU/RUTHIMITU	UTHIRU	UTHIRU 87/MUTHWA	5
46	DAGORETTI	KAWANGWARE	KAWANGWARE	CENTRE/CIUGUINI	5
47	DAGORETTI	KAWANGWARE	GATINA	KAMITHA	5
48	KIBERA	KIBERA	KIBERA	KAMBI MURU	5
49	KIBERA	KIBERA	SILANGA	SILANGA	5
50	KIBERA	MUGUMOINI	BOMAS	QUARRY VILLAGE	5
51	KIBERA	LAINI SABA	NYAYO HIGHRISE	KIBERA	5
52	KIBERA	SERA NGOMBE	OLYMPIC	SOWETO	5

Considering the Nairobi divisions, the areas with poor people are not uniformly distributed and therefore we adopt stratified random sampling to identify areas with target population from which we will obtain responses while collecting data. Table 4.6 gives a summary of distribution of areas with poor people in Nairobi.

Table 4.6: Analysis of Sample frame

Division	Number of areas	Percentage
CENTRAL	6	12
DAGORETTI	6	12
EMBAKASI	13	25
KASARANI	9	17
KIBERA	6	12
MAKADARA	4	8
PUMWANI	5	10
WESTLANDS	3	6
TOTAL	**52**	**100**

Due to non-uniform distribution of poor people within Nairobi Divisions the stratified random sampling scheme assumes the following steps;

Step 1:

For each of the eight divisions we use EANAME as a stratum arranged according to cluster numbers in increasing order. This is summarized by table 4.7

Table 4.7: Strata from Sampling Frame.

DIVISION	CLUSTER NUMBER	LOCATION/SUB-DIVISION	EANAME	LEVEL
Strata 1				
CENTRAL	1261	KARIOKOR	CHAI ROAD	4
CENTRAL	1263	MATHARE	VILLAGE 2	5
CENTRAL	1264	MATHARE	KAMWINGI	4
CENTRAL	1265	HURUMA	KIA MAIKO	5
CENTRAL	1266	HURUMA	HURUMA	4
CENTRAL	1267	HURUMA	HURUMA	4
Strata 2				
DAGORETTI	1345	MUTUINI	SAIGONI 'A'	4
DAGORETTI	1346	UTHIRU/RUTHIMITU	UTHIRU 87/MUTHWA	5
DAGORETTI	1347	KAWANGWARE	CENTRE/CIUGUINI	5
DAGORETTI	1348	KAWANGWARE	KAMITHA	5
DAGORETTI	1349	RIRUTA	RIRUTA SATELLITE	4
DAGORETTI	1350	RIRUTA	DAGORETTI	4

DIVISION	CLUSTER NUMBER	LOCATION/SUB-DIVISION	EANAME	LEVEL
Strata 3				
EMBAKASI	1291	MUKURU KWANJENGA	MUKURU KWANJENGA	4
EMBAKASI	1293	MUKURU KWANJENGA	MUKURU KWANJENGA	5
EMBAKASI	1294	UMOJA	UMOJA II	4
EMBAKASI	1296	UMOJA	MUTHAIGA	4
EMBAKASI	1297	KAYOLE	KAYOLE	4
EMBAKASI	1298	KAYOLE	KAYOLE	4
EMBAKASI	1299	KAYOLE	KAYOLE	4
EMBAKASI	1301	NJIRU	MAILI SABA	5
EMBAKASI	1302	DANDORA	DANDORA PHASE I	4
EMBAKASI	1303	DANDORA	DANDORA PHASE II	4
EMBAKASI	1304	DANDORA	PHASE III	4
EMBAKASI	1305	DANDORA	PHASE IV	4
EMBAKASI	1306	KARIOBANGI SOUTH	JUA KALI	4
Strata 4				
KASARANI	1274	KARIOBANGI	MARURA	4
KASARANI	1275	KARIOBANGI	KASABUNI	4
KASARANI	1276	KARIOBANGI	BABA DOGO I	5
KASARANI	1277	KOROGOCHO	NGUNYUMU VILLAGE	4
KASARANI	1278	KOROGOCHO	HIGH-RIDGE	5
KASARANI	1280	GITHURAI	GITHURAI	4
KASARANI	1282	RUARAKA	UTALII	4
KASARANI	1283	RUARAKA	MATHARE NORTH	4
KASARANI	1284	RUARAKA	MATHARE NORTH	4
Strata 5				
KIBERA	1352	KIBERA	KAMBI MURU	5
KIBERA	1353	KIBERA	SILANGA	5
KIBERA	1364	MUGUMOINI	QUARRY VILLAGE	5
KIBERA	1366	LAINI SABA	KIBERA	5
KIBERA	1367	LAINI SABA	HIGHRISE	4
KIBERA	1368	SERA NGOMBE	SOWETO	5
Strata 6				
MAKADARA	1268	MAKONGENI	MAKONGENI	4
MAKADARA	1270	MAKADARA	JERICHO	4
MAKADARA	1271	MARINGO	OFAFA I	4
MAKADARA	1272	VIWANDANI	LUNGA LUNGA	5

DIVISION	CLUSTER NUMBER	LOCATION/SUB-DIVISION	EANAME	LEVEL
Strata 7				
PUMWANI	1308	EASTLEIGH NORTH	SECTION II	4
PUMWANI	1309	EASTLEIGH SOUTH	EASTLEIGH SOUTH	4
PUMWANI	1310	EASTLEIGH NORTH	EASTLEIGH NORTH	4
PUMWANI	1311	PUMWANI	MAJENGO	5
PUMWANI	1312	BAHATI	OUTER RING ESTATE	4
Strata 8				
WESTLANDS	1329	KANGEMI	GICHAGI	4
WESTLANDS	1331	KANGEMI	MARENGA	4
WESTLANDS	1332	KANGEMI	WARUKU	4

Step 2:

By choosing a random starting point (the fifth cluster number) within every Division we consider EANAME as an area with poor people from whom we intent to collect data. A summary of the areas considered is provided by table 4.8.Westlands and Makadara Divisions had least percentage contribution of areas with poor people (6% and 8% respectively) and consequently they had no areas falling in the fifth positions of their cluster numbers.

Table 4.8: Six areas with poor people generated through Stratified random Sampling.

DIVISION	CLUSTER NUMBER	EANAME
CENTRAL	1266	HURUMA
DAGORETTI	1349	RIRUTA SATELLITE
EMBAKASI	1297	KAYOLE
EMBAKASI	1303	DANDORA PHASE II
KASARANI	1278	HIGH-RIDGE
KIBERA	1367	HIGHRISE
MAKADARA		NONE
PUMWANI	1312	OUTER RING ESTATE
WESTLANDS		NONE

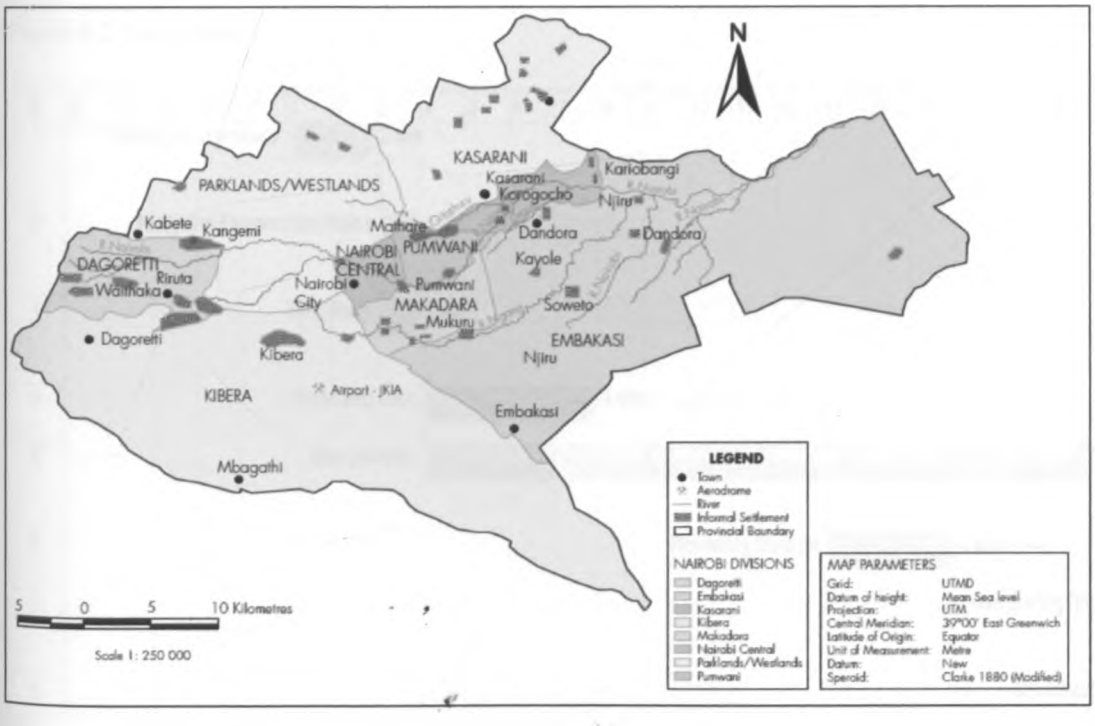
For the purposes of data analysis obtained responses from 311 respondents suitable for Structural Equation Modelling, although 200 is the least required value for SEM. Distributing the three hundred respondents within the six areas, the each area would be allocated a value of 50 respondents.

Considering that we will collect data about M-PESA, Airtel Money and Orange Money whose levels of penetration within the regions of interest vary, we will obtain responses proportional to the number of subscribers to each of the services. We will give M-PESA 85% of responses, 10% to Airtel Money and 5% to the Orange Money. The distribution of respondents is given by table 4.9.

Table 4.9: Summary of Distribution of Responses

Area of study	M-PESA Respondents	Airtel Money Respondents	Orange Money Respondents	Total
HURUMA	43	6	3	52
RIRUTA SATELLITE	43	6	3	52
KAYOLE	43	6	3	52
DANDORA PHASE II	43	6	3	52
HIGH-RIDGE	43	6	3	52
OUTER RING ESTATE	43	5	3	51
TOTAL	258	35	18	311

Figure 4.1: Map of Nairobi Divisions



Map production: RCMRD

4.5 Data Collection Tool

To obtain relevant information, we administered a questionnaire to subscribers of Mobile Money Transfer Service Users as well as agents. Sample of the questionnaire is provided in appendix.

4.6 Research Activity Scheduling

ID	Task Name	Start	Finish	Late Start	Late Finish	Free Slack	Total Slack
1	Training Enumerators	Mon 10/31/11	Fri 11/11/11	Mon 10/31/11	Fri 11/11/11	0 wks	0 wks
2	Assigning Enumerators Roles	Mon 11/14/11	Fri 11/18/11	Mon 1/16/12	Fri 1/20/12	0 wks	9 wks
3	Pilot Study	Mon 11/14/11	Fri 11/18/11	Mon 11/14/11	Fri 11/18/11	0 wks	0 wks
4	Collecting Data	Mon 11/21/11	Fri 12/16/11	Mon 1/23/12	Fri 2/17/12	5 wks	9 wks
5	Data analysis	Mon 11/21/11	Fri 3/9/12	Mon 11/21/11	Fri 3/9/12	0 wks	0 wks
6	Reporting findings	Mon 1/23/12	Fri 2/10/12	Mon 2/20/12	Fri 3/9/12	4 wks	4 wks
7	Interpreting findings	Mon 3/12/12	Fri 3/23/12	Mon 3/12/12	Fri 3/23/12	0 wks	0 wks
8	Submission of final report	Mon 3/26/12	Fri 3/30/12	Mon 3/26/12	Fri 3/30/12	0 wks	0 wks

Figure 4.2 Gantt Chart

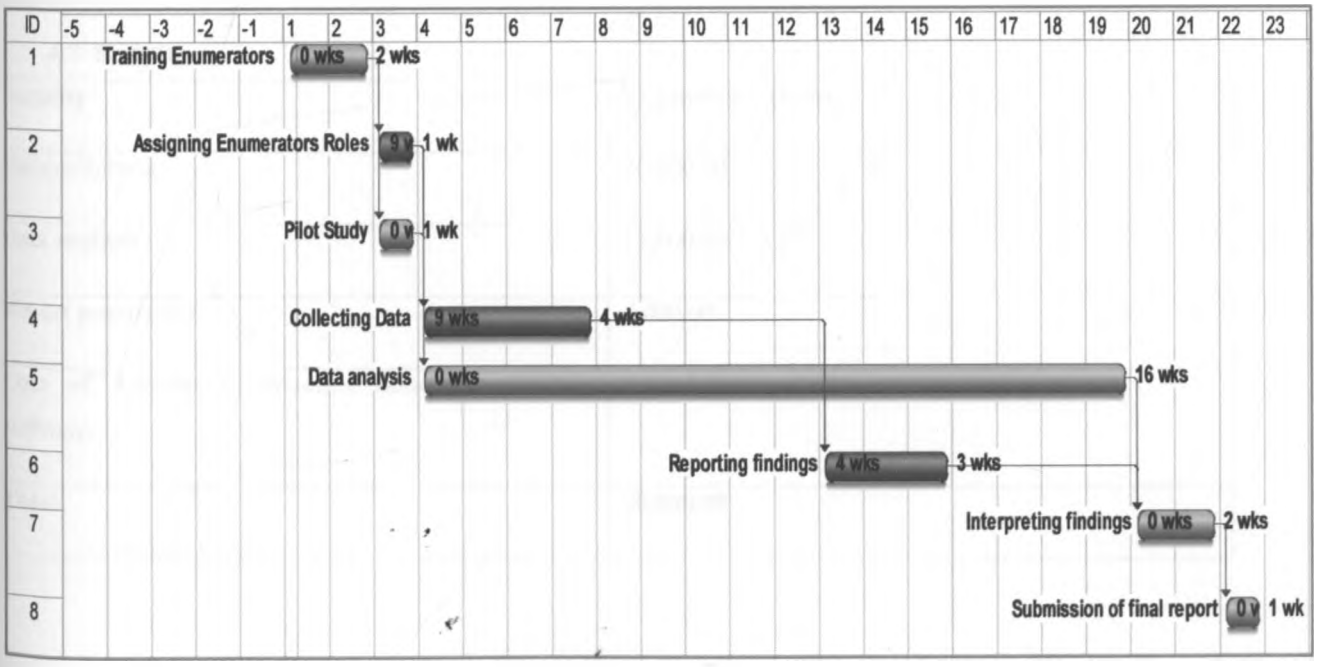
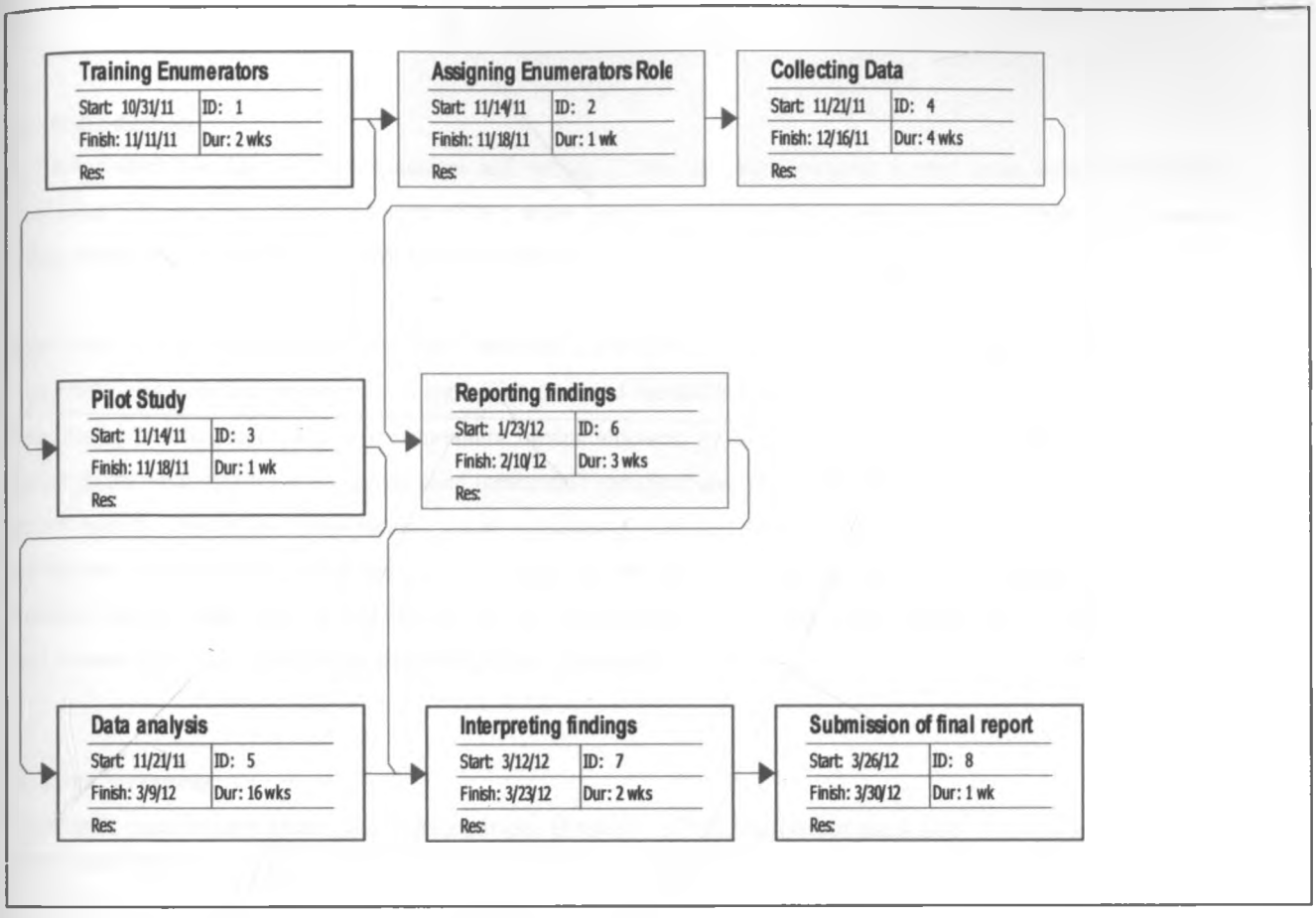


Figure 4.3 Network Diagram



4.7 Budget

Activity	**Expenditure (Kshs)**
Data collection	30,000.00
Data analysis	15,000.00
Report preparation	5,000.00
Cost of Analysis of Moment Structures (AMOS) software.	40,000.00
Total	**90,000.00**

CHAPTER 5

DATA ANALYSIS

5.1 Introduction

In this chapter we discuss the assessment and testing of the proposed research model using structural equation modeling. The analysis process consists of two steps. Step one involves the assessment of the measurement model where model fit and validity is tested; based on satisfactory results, step two proceeds with hypotheses testing.

Hair et al., (2006) argue that the two steps approach is preferred to the one step approach since it assures that good constructs measures are represented in the valid structural model. Schumacher & Lomax (2004) also report a two-step model building approach: a measurement model followed by the structural model. The measurement model specifies the relationships among measured (observed) variables underlying the latent variables while the structural model specifies the relationships among latent variables as posited by theory. The measurement model provides an assessment of convergence and discriminant validity, and the structural model provides an assessment of nomological validity. Before subjecting the data sets for the two steps structural equation modeling procedures, the data sets are first screened for multivariate assumptions to ensure conformity.

5.2 Data Screening

Research instrument items were examined, through SPSS statistical package, for accuracy of data entry and missing values. The following results were obtained.

Warnings

There are no variables with 5% or more missing values. TTEST table is not produced.
There are no categorical variables. CROSSTAB is not produced.
There are no variables with 5% or more missing values. MISMATCH table is not produced.

Missing values were below 5 per cent on the Likert scale items; thus replacement with the mean value was applied (Tabachnick & Fidell, 2007; Hair et al., 2006).

Normality was first assessed through the descriptive analysis where skewness and kurtosis outputs indicated an acceptable level of normality (±1) for some of the observations and that no transformation remedy was required. However there were other observations whose skewness was beyond acceptable level of normality (±1).Further assessment was carried out through the residual analysis using the expected normality P-P plot for the regression residuals. The plot revealed an acceptable level of normality where the standardized predicted value formed a line with the standardized residuals.

Table 5.1: Assessment of normality: observations whose skewness was beyond acceptable level of normality (±1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
Q15	1	5	-1.847	-13.297	4.307	15.503
Q7	1	5	-1.603	-11.541	3.488	12.556
Q8	1	5	-1.601	-11.527	6.063	21.826
Q17	1	5	-1.496	-10.767	2.768	9.966
Q6	1	5	-1.426	-10.266	4.418	15.906
Q11	1	5	-1.366	-9.835	2.674	9.625
Q9	1	5	-1.359	-9.784	3.291	11.847
Q10	1	5	-1.357	-9.769	5.087	18.311
Q16	1	5	-1.233	-8.877	1.608	5.788
Q13	1	5	-1.103	-7.941	1.812	6.522
Q30	1	5	-1.095	-7.884	1.437	5.172
Q12	2	5	-1.016	-7.313	1.179	4.242
Duration_Usage	1	15	1.456	10.483	14.079	50.68

Table 5.2: Assessment of normality: observations whose skewness was within acceptable level of normality (±1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
Q23	1	5	-0.87	-6.265	1.516	5.457
Q31	2	5	-0.779	-5.612	0.05	0.178
Q14	2	5	-0.729	-5.25	0.117	0.42
Education	0	17	-0.724	-5.212	0.205	0.739
Q21	1	5	-0.056	-0.403	-1.484	-5.343
Q22	1	5	0.209	1.503	-1.431	-5.151
Gender	1	2	0.386	2.782	-1.851	-6.662
Age	13	64	0.823	5.924	0.387	1.393

Table 5.3: Univariate Statistics

	N	Mean	Std. Deviation	Missing		No. of Extremes(a,b)	
	Count	Percent	Low	High	Count	Percent	Low
Gender	311	1.41	.492	0	.0	0	0
Age	311	32.58	9.492	0	.0	0	3
Education	310	11.07	3.136	1	.3	8	0
Duration_Usage	311	3.84	1.337	0	.0	0	1
Q6	311	4.29	.700	0	.0	8	0
Q7	310	4.19	.843	1	.3	20	0
Q8	310	4.51	.606	1	.3	3	0
Q9	310	4.27	.714	1	.3	14	0
Q10	310	4.38	.631	1	.3	5	0
Q11	310	4.17	.806	1	.3	19	0
Q12	310	4.17	.777	1	.3	17	0
Q13	310	4.22	.757	1	.3	13	0
Q14	310	4.15	.799	1	.3	12	0
Q15	310	4.39	.820	1	.3	14	0
Q16	310	4.00	.947	1	.3	27	0
Q17	310	4.40	.752	1	.3	12	0
Q18	310	4.20	.783	1	.3	14	0
Q19	310	4.18	.657	1	.3	10	0
Q20	310	3.69	.960	1	.3	12	0
Q21	310	3.41	1.268	1	.3	0	0
Q22	310	3.08	1.318	1	.3	0	0
Q23	310	3.99	.759	1	.3	.	.
Q24	310	3.71	1.046	1	.3	7	0
Q25	310	3.67	.931	1	.3	2	0
Q26	310	3.04	1.440	1	.3	0	0
Q27	310	2.27	1.004	1	.3	0	9
Q28	310	2.02	.892	1	.3	0	25
Q29	310	3.05	1.188	1	.3	0	0
Q30	310	4.35	.734	1	.3	6	0
Q31	308	4.36	.701	3	1.0	3	0

a Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).
b . indicates that the inter-quartile range (IQR) is zero.

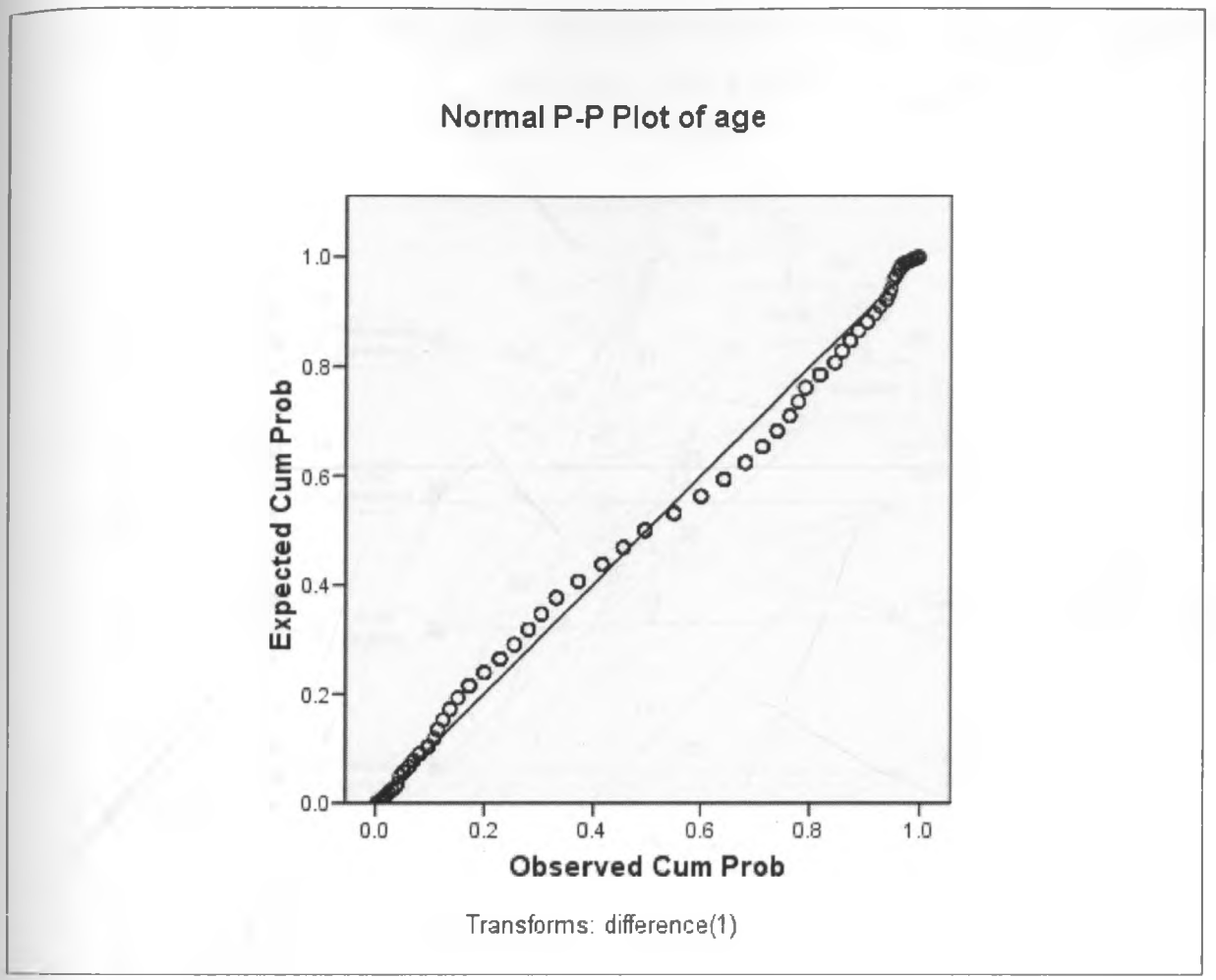


Figure 5.1: Normal P-P Plot of age

After looking at the assumptions for multivariate analysis, we proceed with multivariate analysis; namely the two steps SEM approach: confirmatory factor analysis to assess the measurement model fit and validity followed by the structural model to test the prescribed relationships in the research model.

Our study is applying the Confirmatory Factor Analysis (CFA) approach to assess the measurement model. The measurement model was drawn on the AMOS (version 7) graphics. In CFA, distinguishing between dependent and independent variables is not necessary for the measurement stage. CFA is run with all variables linked as shown in Figure 5.2 where measured variables are shown in rectangular shapes by labels that match statements Q6-Q31 on the Likert scale, together with age gender and education. Latent variables are shown in the oval shapes. One-headed connectors indicate a causal path from a construct to an indicator. Next, we apply the process of measurement model fit and validity and if a measurement model with acceptable fit and established validity is reached, then the second stage, structural model testing, is carried out.

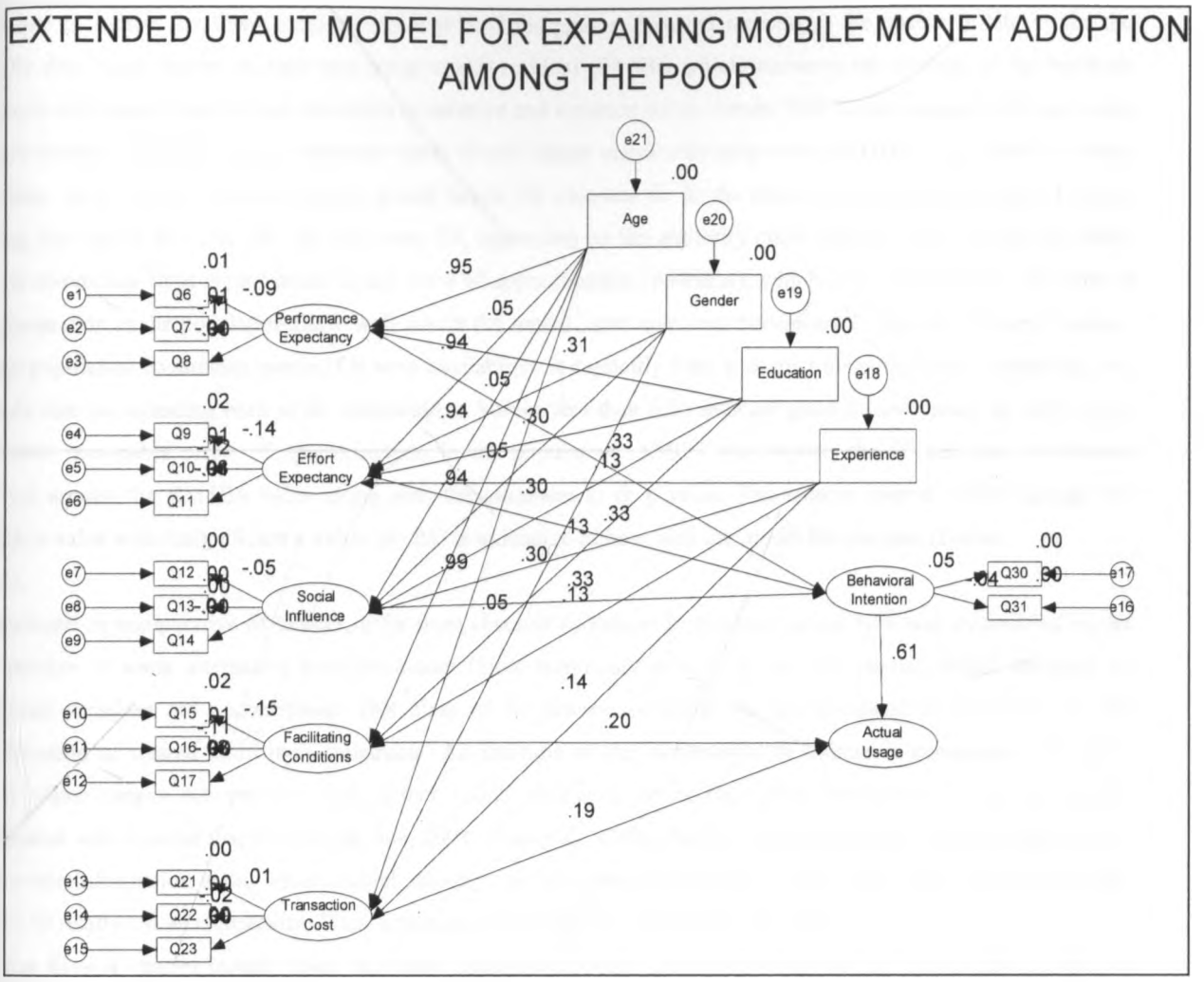


Figure 5.2: The Extended UTAUT model for adoption of Mobile Money among the poor

After running the maximum likelihood estimate for the working file revealed significant Chi-square statistics where χ^2 = 1,694.499 with 193 degrees of freedom indicating that the model should be rejected. However, relying on chi-square statistics for assessing model specifications can be misleading (MacCallum, 1990; Byrne, 2001; Schumacker & Lomax, 2004; Hair et al., 2006) in more than one way and especially:

- The larger the sample size, the more likely the rejection of the model and the more likely a Type II error (rejecting something true).
- In very large samples, even tiny differences between the observed model and the perfect fit model may be found significant.
- The chi-square fit index is also very sensitive to violations of the assumption of multivariate normality.

These reasons tend to suggest that chi-square goodness of fit (GOF) should not be used as a sole indictor of model fit (Hair et al., 2006).

Absolute fit indices are direct measures of how well the proposed model reproduces the observed data or fits the sample data. Such indices include root mean square residual (RMSR) which measures the average of the residuals between individual observed and estimated covariance and variance terms. Lower RMSR and standardized root mean square residual (SRMSR) values represent better fit and higher values represent worse fit (Hair et al., 2006). A value less than .05 is widely considered good fit and below .08 adequate fit. In the literature one will find rules of thumb setting the cut off at < .10, .09, .08, and even .05, depending on the authority cited (Garson, n.d). Another fit index that is commonly cited is root mean square error of approximation (RMSEA), which takes into account the error of approximation in the population (how well would the model, with unknown but optimally chosen parameter values, fit the population covariance matrix if it were available?). It explicitly tries to correct for both model complexity and sample size by including each in its computation. Values less than 0.05 indicate good fit and values as high as .08 represent reasonable errors of approximation in the population. AMOS also reports the 90 per cent confidence interval around the RMSEA value along with the closeness to fit p value. The narrow interval values around the RMSEA value with insignificant p value (p>.05) is indicative of how well the model fits the data (Byrne, 2001).

Incremental or comparative fit indices differ from absolute fit indices in that they assess how well a specified model fits relative to some alternative baseline model (most commonly referred to as null model), which assumes all observed variables are uncorrelated. This class of fit indices represents the improvement in the in fit by the specification of related multi-item constructs. An example of the incremental fit indices is comparative fit index (CFI) which ranges between 0-1 with higher values indicating better fit. Values less than .90 are not usually associated with a model that fits well (Byrne, 2001; Hair et al., 2006). Parsimony fit indices are designed specifically to provide information about which model among a set of competing models is best, taking into consideration the model fit relative to its complexity. Thus, a parsimony fit measure can be improved either by a better fit or a simpler model (fewer estimated parameters paths). The most widely applied parsimony fit index is parsimony normed fit index (PNFI) which is derived from the incremental fit index (NFI: normed fit index) only adjusted by multiplying it times the parsimony ratio (PR= degrees of freedom used by the model: total degrees of freedom available). PNFI with relatively high values represents relatively better fit (Hair et al., 2006).

AMOS prints 25 different goodness-of-fit measures and the choice of which to report is a matter of dispute among methodologists. Hair at al. (2006) recommend reporting Chi squared statistics in addition to another absolute index such as RMSEA and an incremental index such as CFI. When comparing model of varying complexity, they recommend adding PNFI measure. Others report GFI or more recently, SRMR, instead.

Following these guides, the model fit indices for the total sample in the initial CFA run produced the following indices.

Table 5.4: RMSEA (Root Mean Square Error of Approximation)

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.158	.152	.165	.000
Independence model	.153	.146	.159	.000

RMSEA=.158 with 90 per cent confidence interval (low. 152; high. 165) indicating room for further improvement or model refinement.

MI output had the following readings indicating the need for measurement refinement:

Table 5.5: MI (Modification Index) –Covariances Output

Path			M.I.	Par Change
e21	<-->	e18	17.922	3.041
e21	<-->	e19	7.656	-4.561
e16	<-->	e18	4.187	0.108
e17	<-->	e18	5.004	0.124
e17	<-->	e19	10.134	-0.405
e17	<-->	e16	128.07	0.327
e13	<-->	e18	4.413	0.201
e14	<-->	e16	6.75	0.135
e14	<-->	e13	124.969	1.054
e15	<-->	e13	13.195	-0.197
e15	<-->	e14	10.803	-0.186
e10	<-->	e16	13.247	0.116
e10	<-->	e17	10.761	0.11
e10	<-->	e15	8.562	0.102
e11	<-->	e19	5.811	-0.394
e11	<-->	e16	12.961	0.134
e11	<-->	e17	17.487	0.163
e11	<-->	e10	9.241	0.131
e12	<-->	e19	14.944	-0.504
e12	<-->	e16	36.376	0.179
e12	<-->	e17	54.593	0.23
e12	<-->	e14	5.589	0.132
e12	<-->	e10	27.921	0.182
e12	<-->	e11	10.238	0.128
e7	<-->	e18	8.793	0.174
e7	<-->	e16	64.675	0.246
e7	<-->	e17	54.26	0.237
e7	<-->	e10	35.259	0.211

Path			M.I.	Par Change
e7	<-->	e11	5.505	0.097
e7	<-->	e12	59.609	0.254
e8	<-->	e18	8.222	0.164
e8	<-->	e19	5.405	-0.305
e8	<-->	e16	50.384	0.212
e8	<-->	e17	34.472	0.184
e8	<-->	e10	38.17	0.214
e8	<-->	e11	4.755	0.088
e8	<-->	e12	89.852	0.304
e8	<-->	e7	133.518	0.383
e9	<-->	e18	5.768	0.145
e9	<-->	e19	12.137	-0.482
e9	<-->	e16	33.388	0.182
e9	<-->	e17	34.128	0.193
e9	<-->	e10	24.083	0.18
e9	<-->	e12	39.781	0.214
e9	<-->	e7	89.381	0.331
e9	<-->	e8	85.149	0.315
e4	<-->	e18	4.618	0.115
e4	<-->	e16	19.273	0.123
e4	<-->	e17	15.179	0.114
e4	<-->	e13	6.197	0.126
e4	<-->	e14	8.951	0.158
e4	<-->	e10	30.134	0.178
e4	<-->	e11	5.893	0.091
e4	<-->	e12	11.179	0.1
e4	<-->	e7	5.754	0.074
e4	<-->	e8	11.859	0.104
e5	<-->	e20	6.515	-0.044
e5	<-->	e16	21.479	0.115
e5	<-->	e17	15.336	0.102
e5	<-->	e13	7.204	0.12
e5	<-->	e14	6.055	0.115
e5	<-->	e10	41.435	0.185
e5	<-->	e11	6.441	0.085
e5	<-->	e12	14.157	0.1
e5	<-->	e7	19.437	0.121
e5	<-->	e8	18.85	0.116
e5	<-->	e9	17.029	0.117
e5	<-->	e4	126.236	0.282

Path			M.I.	Par Change
e6	<-->	e17	5.376	0.077
e6	<-->	e10	15.727	0.146
e6	<-->	e7	6.957	0.093
e6	<-->	e9	4.844	0.08
e6	<-->	e4	15.465	0.126
e6	<-->	e5	10.027	0.09
e1	<-->	e16	23.457	0.133
e1	<-->	e17	11.851	0.1
e1	<-->	e13	14.604	0.191
e1	<-->	e10	27.113	0.167
e1	<-->	e11	11.158	0.124
e1	<-->	e7	18.005	0.13
e1	<-->	e8	9.092	0.09
e1	<-->	e9	20.368	0.142
e1	<-->	e4	18.657	0.121
e1	<-->	e5	33.385	0.143
e1	<-->	e6	4.177	0.065
e2	<-->	e16	18.391	0.142
e2	<-->	e17	4.203	0.071
e2	<-->	e13	6.154	0.149
e2	<-->	e14	20.511	0.282
e2	<-->	e10	8.434	0.112
e2	<-->	e11	4.237	0.092
e2	<-->	e7	7.005	0.097
e2	<-->	e9	5.485	0.089
e2	<-->	e4	13.95	0.125
e2	<-->	e5	14.726	0.114
e2	<-->	e1	28.877	0.178
e3	<-->	e16	17.493	0.1
e3	<-->	e17	14.371	0.095
e3	<-->	e13	12.292	0.152
e3	<-->	e14	6.387	0.114
e3	<-->	e10	10.279	0.089
e3	<-->	e11	5.567	0.076
e3	<-->	e12	28.219	0.137
e3	<-->	e7	19.575	0.118
e3	<-->	e8	42.313	0.169
e3	<-->	e9	22.814	0.131
e3	<-->	e4	14.653	0.093
e3	<-->	e5	15.253	0.084

Path			M.I.	Par Change
e3	<-->	e1	40.283	0.152
e3	<-->	e2	35.168	0.17

Byrne (2001) suggests that only those items that demonstrate high covariance plus high regression weight in the modification indexes should be candidate for deletion. As for the other criteria, if an item proves to be problematic on most of the levels mentioned above, then it is also candidate for deletion. However this might cause un-identification problems.

5.3 Constructs' Validity

Construct validity can be assessed by convergent validity, discriminant validity, and nomological validity.

Convergent validity of a construct is the extent to which indicators of a specific construct converge or share a high proportion of variance in common. Convergent validity can be estimated by factor loadings, variance extracted and reliability. Most of loadings in the standardized regression weights output are above 0.6 except the ones given below.

Table 5.6: Standardized Regression Weights

Path			Estimate
Performance_Expectancy	<---	Gender	0.049
Effort_Expectancy	<---	Gender	0.049
Social_Influence	<---	Gender	0.049
Transaction_Cost	<---	Gender	0.051
Effort_Expectancy	<---	Duration_Usage	0.133
Social_Influence	<---	Duration_Usage	0.133
Facilitating_Conditions	<---	Duration_Usage	0.133
Transaction_Cost	<---	Duration_Usage	0.139
Actual_Usage	<---	Transaction_Cost	0.194
Actual_Usage	<---	Facilitating_Conditions	0.204
Effort_Expectancy	<---	Education	0.304
Social_Influence	<---	Education	0.304
Facilitating_Conditions	<---	Education	0.305
Performance_Expectancy	<---	Education	0.307
Behavioral_Intetion	<---	Performance_Expectancy	0.332
Behavioral_Intetion	<---	Effort_Expectancy	0.335
Behavioral_Intetion	<---	Social_Influence	0.335

Discriminant validity is the extent to which a construct is truly distinct from other constructs. Nomological validity refers to the degree that the summated scale makes accurate predictions of other concepts in a theoretically based model. Nomological validity is tested by examining whether the correlations among the constructs in the measurement theory make sense. Thus, this validity is tested in the structural model. However forgoing discussion tends to suggest that both convergent validity and discriminant validity have not been met.

5.4 The Structural Model

Testing the structural model involves testing the hypothesized theoretical model or the relationships between latent constructs. The structural model differs from the measurement model in that the emphasis moves from the relationships between latent constructs and measured variables to the nature and magnitude of the relationships between constructs (Hair et al., 2006).

Table 5.7: Selected AMOS text output for standardized regression weights

Path			Estimate
Performance Expectancy	<---	Gender	0.049
Effort Expectancy	<---	Gender	0.049
Social Influence	<---	Gender	0.049
Transaction Cost	<---	Gender	0.051
Effort Expectancy	<---	Experience	0.133
Social Influence	<---	Experience	0.133
Facilitating Conditions	<---	Experience	0.133
Transaction Cost	<---	Experience	0.139
Actual Usage	<---	Transaction Cost	0.194
Actual Usage	<---	Facilitating Conditions	0.204
Effort Expectancy	<---	Education	0.304
Social Influence	<---	Education	0.304
Facilitating Conditions	<---	Education	0.305
Performance Expectancy	<---	Education	0.307
Behavioral Intention	<---	Performance Expectancy	0.332
Behavioral Intention	<---	Effort Expectancy	0.335
Behavioral Intention	<---	Social Influence	0.335
Actual Usage	<---	Behavioral Intention	0.61
Effort Expectancy	<---	Age	0.942
Social Influence	<---	Age	0.942
Facilitating Conditions	<---	Age	0.943
Performance Expectancy	<---	Age	0.95
Transaction Cost	<---	Age	0.989

Nonetheless, the standardized estimates indicate the direct paths only, whereas, the standardized total effects give a more comprehensive picture of variables' impacts in the model.

Table 5.8: Standardized Total Effects

	Duration Usage	Education	Gender	Age	Social Influence	Effort Expectancy	Performance Expectancy	Behavioral Intention	Transaction Cost	Facilitating Conditions
Social Influence	0.133	0.304	0.049	0.942	0	0	0	0	0	0
Effort Expectancy	0.133	0.304	0.049	0.942	0	0	0	0	0	0
Performance Expectancy	0	0.307	0.049	0.95	0	0	0	0	0	0
Behavioral Intention	0.089	0.306	0.049	0.947	0.335	0.335	0.332	0	0	0
Transaction Cost	0.139	0	0.051	0.989	0	0	0	0	0	0
Facilitating Conditions	0.133	0.305	0	0.943	0	0	0	0	0	0
Actual Usage	0.108	0.249	0.04	0.962	0.204	0.204	0.202	0.61	0.194	0.204
Q31	-0.004	-0.014	-0.002	-0.042	-0.015	-0.015	-0.015	-0.044	0	0
Q30	0.005	0.016	0.003	0.051	0.018	0.018	0.018	0.053	0	0
Q21	0.002	0	0.001	0.014	0	0	0	0	0.014	0
Q22	-0.003	0	-0.001	-0.019	0	0	0	0	-0.02	0
Q23	0	0	0	-0.002	0	0	0	0	-0.002	0
Q15	-0.02	-0.045	0	-0.139	0	0	0	0	0	-0.148
Q16	-0.014	-0.032	0	-0.099	0	0	0	0	0	-0.105
Q17	-0.004	-0.009	0	-0.027	0	0	0	0	0	-0.029
Q12	-0.006	-0.015	-0.002	-0.046	-0.048	0	0	0	0	0
Q13	0	0	0	-0.001	-0.001	0	0	0	0	0
Q14	-0.002	-0.004	-0.001	-0.014	-0.015	0	0	0	0	0
Q9	-0.018	-0.042	-0.007	-0.129	0	-0.137	0	0	0	0
Q10	-0.016	-0.036	-0.006	-0.111	0	-0.118	0	0	0	0
Q11	-0.011	-0.026	-0.004	-0.08	0	-0.085	0	0	0	0
Q6	0	-0.027	-0.004	-0.084	0	0	-0.088	0	0	0
Q7	0	-0.035	-0.006	-0.108	0	0	-0.114	0	0	0
Q8	0	-0.002	0	-0.005	0	0	-0.005	0	0	0

From the standardized total effects table age has the greatest impact on actual usage of mobile money followed by behavioral Intention. We intended to test the following hypotheses as posited in theory.

H1. The influence of performance expectancy on behavioral intention is considered to be moderated by gender and age such that the effect is stronger for men and particularly the younger men.

H2. The influence of effort expectancy on behavioral intention is considered to be moderated by age, gender and experience such that the effect is stronger for women, particularly the younger women and at early stages of experience.

H3. The influence of social influence on behavioral intention is considered to be moderated by age gender, experience and voluntariness of use such that the effect is stronger for women, particularly the older women in mandatory settings in early stages of experience.

H4. Facilitating conditions are considered not to have significant influence on behavioral intention.

H5. The influence of facilitating conditions on usage is considered to be moderated by age and experience such that the effect is stronger for older people, particularly with increasing experience.

H6. The influence of Transaction Cost on usage behavior will be taken to be stronger among older people particularly with increasing experience.

H7. Behavioral intention is considered to have significant positive influence on usage.

For H1, the influence of Performance expectance on Behavioral intention is estimated at 0.332 with its moderators of age, gender and education at; 0.95, 0.049 and 0.307 respectively. Although this influence is not very significant, the effect of age on performance expectancy is significant.

The results of standardized total influence suggest that H1, H2, H3, H4, H5 and H6 should not be sustained based on their values of influence being below 0.5. But H7 is sustained since the influence of behavioral Intention on Actual usage is significant at estimated value of 0.61.This is quite in accordance with theoretical model.

Table 5.9: Selected Standardized Total Effects Output

	Experience	Education	Gender	Age	Social Influence	Effort Expectancy	Performance Expectancy	Behavioral Intention	Transaction Cost	Facilitating Conditions
Social Influence	0.133	0.304	0.049	0.942	0	0	0	0	0	0
Effort Expectancy	0.133	0.304	0.049	0.942	0	0	0	0	0	0
Performance Expectancy	0	0.307	0.049	0.95	0	0	0	0	0	0
Behavioral Intention	0.089	0.306	0.049	0.947	0.335	0.335	0.332	0	0	0
Transaction Cost	0.139	0	0.051	0.989	0	0	0	0	0	0
Facilitating Conditions	0.133	0.305	0	0.943	0	0	0	0	0	0
Actual Usage	0.108	0.249	0.04	0.962	0.204	0.204	0.202	**0.61**	**0.194**	**0.204**

From table 5.9, it is quite evident that, hypotheses H1-H7 are all positively tested, since there are no negative values for standardized total effects for the paths of interest for our study. Table 5.10 of standardized regression weights for direct paths incorporates the hypotheses H1-H7 to give a clear illustration of the results of table 5.9

Table 5.10: Selected AMOS text output for standardized regression weights (H1-H7)

Hypotheses	Path			Estimate
H1	Behavioral Intention	<---	Performance Expectancy	0.332
H2	Behavioral Intention	<---	Effort Expectancy	0.335
H3	Behavioral Intention	<---	Social Influence	0.335
H5	Actual Usage	<---	Facilitating Conditions	0.204
H6	Actual Usage	<---	Transaction Cost	0.194
H7	Actual Usage	<---	Behavioral Intention	0.61

H4 is not represented in table 5.10 because there is no path from facilitating conditions to behavioral intentions and the standardized total effect of facilitating conditions on behavioral intention is estimated to be zero as confirmed by table 5.9.H6 was a special hypotheses for our study and from table 5.10 the standardized regression weight of the path from Transaction Cost to Actual Usage is estimated at 0.194 slightly below that of Facilitating Condition to Actual Usage which is estimated at 0.204.Changing the path of Transaction Cost from Actual Usage to Behavioral Intention ,its regression weight increases by 0.005 from 0.194 to 0.244.Consquently the regression weight of the path from Behavioral Intention to Actual Usage increases by 0.187 from 0.61 to0.797.Changing the path to Facilitating Conditions, the regression weight of the path from Transaction Cost to facilitating Conditions increases from its initial value of 0.194 to 0.49,an increase by 0.296.The increase is greater than that of changing the path to behavioral Intention(by 0.291).Consequently the regression weight of the path from Facilitating Conditions to Actual Usage increases by 0.186 from 0.204 to 0.39.Although this less than the increase of regression weight of the path from Behavioral Intention to Actual Usage when the change of path from Transaction Cost is effected, the change of the value of regression weight of path from Transaction Cost to Facilitating Conditions is more significant.

From the discussion of the results, the influence of Transaction Cost on Actual Usage of Mobile Money Transfer Service among the poor has little identifiable significance which increases when Transaction Cost is used to moderate Facilitating Conditions instead of directly influencing Actual Usage.

CHAPTER 6

DISCUSSION AND CONCLUSIONS

6.6 Introduction

This research had three main objectives aiming to:

i. Extend the UTAUT to account for the Mobile Money Transfer Service usage behavior among poor people.

ii. Examine the role of Transaction cost in explaining Mobile Money Adoption among the poor.

iii. Validate the extended UTAUT model.

In order to achieve the research objective, our study started by investigating the applicability of one sample on creating an acceptable model. The model has items-variable representation for the five variables comprising the research model: performance expectancy, effort expectancy, Social Influence, Facilitating Conditions and Transaction Cost while Actual Usage is the dependent variable. In this chapter, the discussion is organized around the hypotheses testing results and findings in respect to the proposed research model. Finally the chapter concludes by addressing the fulfillment of the research objectives.

6.7 Discussion of Results related to the Extended UTAUT Structural Model

The research model structure is depicted in Figure 6.1 below. Our discussion covers findings in respect to the major variables in the research model: effort expectancy, performance expectancy, social influences, facilitating conditions, transaction cost and their relationship with the dependent variable, Actual Usage of Mobile Money Transfer Service. In the model, specifications for the effort expectancy variable resulted in three indicators measuring the degree of ease associated with Actual Usage of Mobile Money Transfer Service. These indicators cover users' characteristics that measure the degree of effort required for Mobile Money such as skillfulness, ability to use and learn system-usage.

Performance expectancy variable refers to the degree to which individuals believe that using the system will help them attain gains in job performance (Venkatesh et al., 2003), and resembles other constructs such as TAM's perceived usefulness, the Motivation Model's extrinsic motivation construct, the MPCU's job fit construct, the DOI's relative advantage construct, and the Social Cognitive Theory's (SCT) outcome expectancy construct. In this model, specifications for the performance expectancy variable resulted in three indicators measuring the perceived performance gains related to the use of Mobile Money Transfer Service. These indicators cover characteristics of Mobile Money Transfer Service related to usefulness, speed, and time effectiveness regarding task accomplishment.

The social influence variable in the extended UTAUT model refers to the degree to which an individual perceives that important others believe she/he should use the new system (Venkatesh et al., 2007), and resembles other constructs in the aggregated models comprising the UTAUT such as subjective norms in TRA, TAM2, TPB/DTPB,

and combined TAM-TPB; social factors in MPCU; and image in DOI. In our model, social influence specifications in the measurement model refinement stage resulted in keeping three indicators measuring this variable.

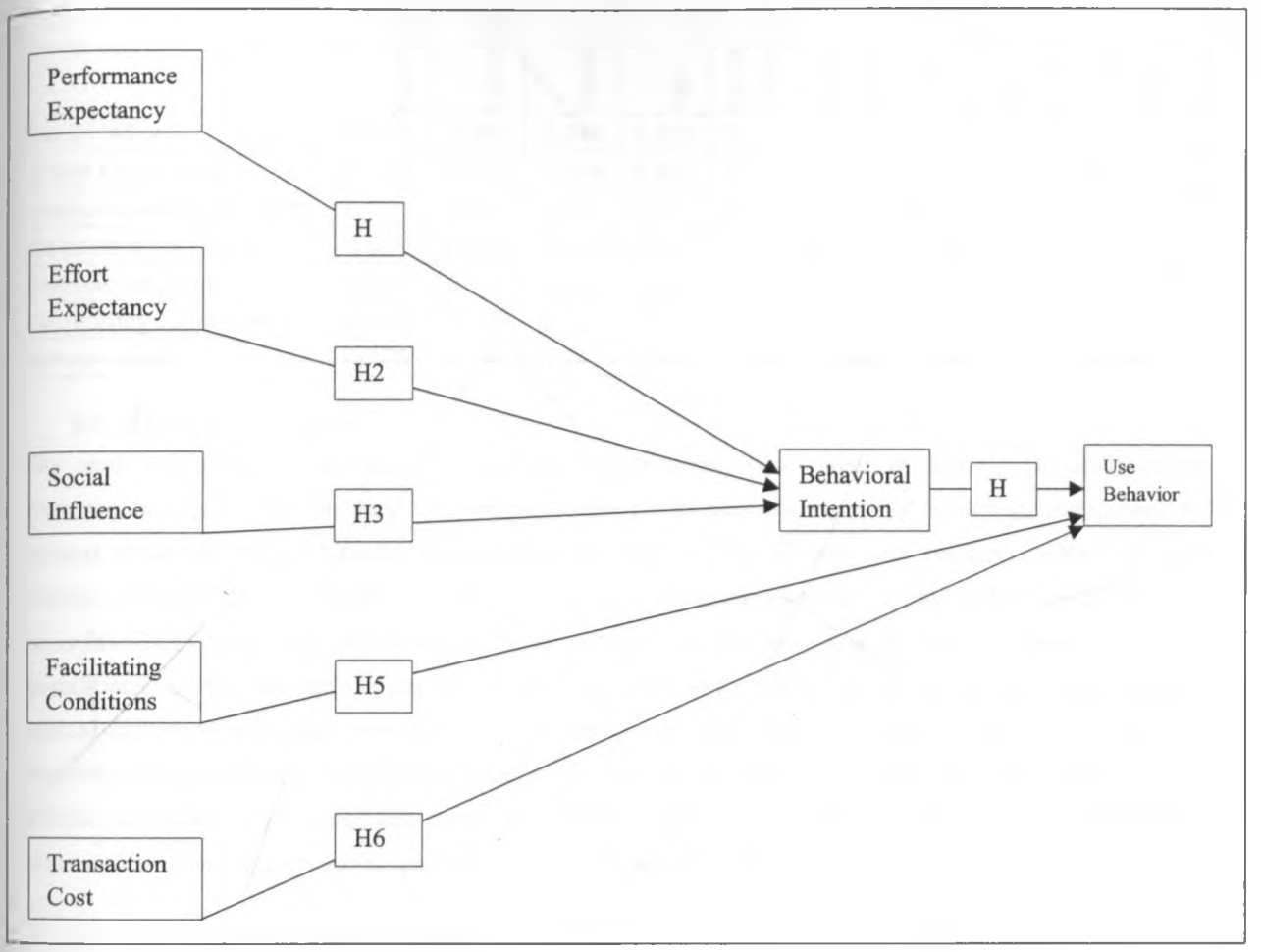


Figure 6.1: Extended UTAUT Structural Model with Hypotheses depicted on the paths.

In summary, evidence has been presented above for the direct and indirect effect of behavioral intention, facilitating conditions on actual usage, which broadly reflects prior findings related to information and system quality research. In the model found support for (H1), (H2), (H2), (H3), (H4), (H5). (H6) and (H7). Moreover, the total effect of behavioral intention is powerful as shown in Table 6.1. The standardized total effect is highest for behavioral intention-Actual Usage path. These results would be beneficial to both new entrants and existing providers of Mobile Money Transfer service since they could be part of blue print for deploying the service. As the firms compete by lowering transactions cost and improve features of the service to facilitate adoption, the poor people would benefit in terms of accessing quality service at reasonable cost.

Table 6.1: Standardized Total effect for the extended structural UTAUT model

	Experience	Education	Gender	Age	Social Influence	Effort Expectancy	Performance Expectancy	Behavioral Intention	Transaction Cost	Facilitating Conditions
Social Influence	0.133	0.304	0.049	0.942	0	0	0	0	0	0
Effort Expectancy	0.133	0.304	0.049	0.942	0	0	0	0	0	0
Performance Expectancy	0	0.307	0.049	0.95	0	0	0	0	0	0
Behavioral Intention	0.089	0.306	0.049	0.947	0.335	0.335	0.332	0	0	0
Transaction Cost	0.139	0	0.051	0.989	0	0	0	0	0	0
Facilitating Conditions	0.133	0.305	0	0.943	0	0	0	0	0	0
Actual Usage	0.108	0.249	0.04	0.962	0.204	0.204	0.202	0.61	0.194	0.204

6.8 Research Limitations

Our study has produced interesting findings, but does, however, have certain limitations. The study reports a limitation in respect of the findings, which may be limited to the populations, type of technology investigated or the context of Mobile Money Transfer Service Adoption behavior. The research was conducted within the specific domain of Mobile Money Transfer Service. As a result, it is uncertain whether or not the findings can be applied more broadly to other forms of technology. Moreover, users in other areas may not resemble those of this study's populations. Another limitation is that the research was based on a cross-section survey, and the study contains the typical limitations associated with this kind of methodology (e.g., inability to uncover the exact nature of the theoretical linkages being investigated). Finally, this research included only factors specific to the UTAUT in addition to Transaction Cost and that comparative analysis was not conducted due to the limited population size of other mobile money transfer service providers except Safaricom's M-PESA.

6.9 Implications for Future Research

The results of this study have major implications. First, the extended UTAUT model is applicable to explaining the role of transaction cost in influencing Actual Usage of Mobile Money Transfer Service among poor people. The success of the incorporation of the Transaction Cost in the UTAUT model is evident from the results .Nevertheless; there is still a need for more research, especially when the influence of Transaction Cost increases when its path is changed from Actual Usage to Facilitating Conditions which in turn increases its influence on Actual Usage.

6.10 Research Conclusions

The research proposed an extension to the UTAUT model that accounts for the utilization of the unified model within the Mobile Money Transfer Service Adoption behavior context. The proposed extension to incorporate Transaction Cost as a concept has resulted in a new extended UTAUT model, which was successfully integrated into previous UTAUT.The results showed that the Transaction Cost has an impact (directly and indirectly) on the Actual Usage of Mobile Money Transfer Service among the poor people. These results demonstrate the success of the proposed extension in achieving the objectives of this current work (research objectives two and three).

The primary focus of this research was to address the applicability of the UTAUT.

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APPENDIX B: MOBILE MONEY ADOPTION QUESTIONNAIRE

A: M-PESA

B: AIRTEL MONEY

C: ORANGE MONEY

Dear Respondent,

I am a student at University of Nairobi. I am carrying out a research project on "Mobile Money Transfer Service, Adoption Drivers among the poor". This research project is in partial fulfillment for award of Master of Science in Information Systems Degree. Your cooperation in completing this questionnaire as objectively and accurately as possible will be highly appreciated. This information will be kept in strict confidence and will only be used for this research.

Filter Question

1 a) Which of these ranges best describes your household income per month in terms of salary or wages in KShs?

- Less than 10,000
- Between 10,000 and 20,000
- Between 20,000 and 30,000
- Between 30,000 and 40,000
- Over 40,000

1 b) Which of these ranges best describes your household income per month in terms of self employment and property income or business or income from agricultural produce and farming in KShs?

- Less than 10,000
- Between 10,000 and 20,000
- Between 20,000 and 30,000
- Between 30,000 and 40,000
- Over 40,000

TOTAL ----------

If total of 1 a) and 1 b) is less or equal to KShs. 23,671, then proceed with questionnaire, otherwise, terminate.

A: M-PESA

DEMOGRAPHICS

2. **Gender :**

[__] Male [__] Female

3. **Age :**

Kindly indicate your year of birth _____

4. **Highest education level:**

Kindly indicate last class attended during your schooling_____

5. **How long have you used M-PESA**

[__] < 6 months

[__] 6 months to ONE year

[__] ONE year to TWO years

[__] TWO years to THREE years

[__] THREE years to FOUR years

DETERMINANTS

PERFORMANCE EXPECTANCY

6. M-PESA is very useful in managing my finances.
(M-PESA inanisaidia kuhifadhi na kupanga fedha zangu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

7. I don't need to go to bank frequently because I use M-PESA
(Sihitaji kutembelea banki mara kwa mara kwa sababu niko na M-PESA)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

8. I save time by using M-PESA. *(M-PESA hunisaidia kuokoa mda)*

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

EFFORT EXPECTANCY

9. M-PESA was easy to learn

(M-PESA ilikuwa rahisi kujifunza)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

10. M-PESA is easy to use

(M-PESA ni rahisi kutumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

11. The registration process for M-PESA was simple and easy

(Mpangilio wa kusajiliwa kwa M-PESA ulikuwa rahisi na wa kueleweka)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

SOCIAL INFLUENCE

12. My parents, siblings and friends think that I should use M-PESA.

(Wazazi, ndugu zangu na marafiki wanaona ni vyema nitumie M-PESA)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

13. My friends use M-PESA.

(Marafiki wangu hutumia M-PESA)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

14. Using M-PESA makes me feel better than those who do not use it.

(Nikitumia M-PESA najihisi vyema kuliko wasiotumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

FACILITATING CONDITIONS

15. I know how to use M-PESA very well.
(Najua kutumia M-PESA vizuri sana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

16. I get help from the Safaricom about M-PESA when I need it.
(Nikihitaji msaada kutoka Safaricom kuhusu M-PESA, ninasaidiwa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

17. Agents are available for me to use M-PESA
(Agents wa M-PESA wako karibu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

PERCEIVED TRUST

18. If I made a mistake or lost my phone, the M-PESA safeguards my money and information.
(Nikifanya makosa wakati ninatumia M-PESA, kila kitu kitahifadhiwa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

19. My financial information is safe when I use M-PESA
(Hakuna mtu anaweza kuona habari ya fedha zangu ninapotumia M-PESA)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

20. People working and managing M-PESA can be trusted
(Watu wanaosimamia M-PESA wanaaminika)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

TRANSACTION COST

21. The transaction costs for M-PESA are too high

(Gharama ya kutumia M-PESA iko juu sana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

22. Sometimes I don't send money because sending M-PESA is expensive.

(Wakati mwingine situmi pesa kwa sababu kitumia M-PESA ina gharama ya juu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

23. M-PESA is cheaper than Western Union and Banks.

IF THEY NEVER USED THESE CHANNELS, COMPARE IT WITH TRAVELLING BY MATATU TO TAKE THE MONEY TO RECIPIENT

(M-PESA ina gharama ya chini kuliko Western Union ama Benki)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

TRIAL-ABILITY

24. I encourage new users to try M-PESA with little money, before starting to use it.

(Ninawashauri watu wajaribu M-PESA na pesa kidodo, kabla waanze kuitumia kabisa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

25. I tried out the M-PESA service I use before adopting it fully

(nilijaribu M-PESA nione iwapo inafanya kazi vizuri kabla sijaitumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

26. If I try other services like Orange Money or Airtel Money etc for free, I could end up using them.

(Nikijaribu Orange Money ama Airtel Money, bila malipo kwanza, huenda nikaanza kuzitumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

MODERATORS

PERCEIVED RISK

27. Transacting in M-PESA is risky, the information I send can be accessed by other people.
(Kuna hatari nikitumia M-PESA, ujumbe ninaotuma unaweza kujulikana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

28. The cash I put in M-PESA could possibly get lost.
(Pesa nilizoweka kwa M-PESA zaweza kupotea)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

29. The M-PESA technology can fail, e.g. the network collapse
(Teknologia ya M-PESA inaweza kuharibiba wakati wowote)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

ENDOGENOUS VARIABLES

BEHAVIORAL INTENTION

30. I intend to use M-PESA in the near future
(Nanuia kutumia M-PESA hivi karibuni)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

31. I recommend people to use M-PESA
(ninawahimiza watu kutumia M-PESA)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

B: AIRTEL MONEY

DEMOGRAPHICS

2. **Gender :**

[__] Male [__] Female

3. **Age :**

Kindly indicate your year of birth _____

4. **Highest education level:**

Kindly indicate last class attended during your schooling_____

5. **How long have you used AIRTEL MONEY**

[__] < 6 months

[__] 6 months to ONE year

[__] ONE year to TWO years

[__] TWO years to THREE years

[__] THREE years to FOUR years

DETERMINANTS

PERFORMANCE EXPECTANCY

6. AIRTEL MONEY is very useful in managing my finances.
(AIRTEL MONEY inanisaidia kuhifadhi na kupanga fedha zangu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

7. I don't need to go to bank frequently because I use AIRTEL MONEY
(Sihitaji kutembelea banki mara kwa mara kwa sababu niko na AIRTEL MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

8. I save time by using AIRTEL MONEY. *(AIRTEL MONEY hunisaidia kuokoa mda)*

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

EFFORT EXPECTANCY

9. AIRTEL MONEY was easy to learn
(AIRTEL MONEY ilikuwa rahisi kujifunza)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

10. AIRTEL MONEY is easy to use
(AIRTEL MONEY ni rahisi kutumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

11. The registration process for AIRTEL MONEY was simple and easy
(Mpangilio wa kusajiliwa kwa AIRTEL MONEY ulikuwa rahisi na wa kueleweka)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

SOCIAL INFLUENCE

12. My parents, siblings and friends think that I should use AIRTEL MONEY.
(Wazazi, ndugu zangu na marafiki wanaona ni vyema nitumie AIRTEL MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

13. My friends use AIRTEL MONEY.
(Marafiki wangu hutumia AIRTEL MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

14. Using AIRTEL MONEY makes me feel better than those who do not use it.
(Nikitumia AIRTEL MONEY najihisi vyema kuliko wasiotumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

FACILITATING CONDITIONS

15. I know how to use AIRTEL MONEY very well.
(Najua kutumia AIRTEL MONEY vizuri sana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

16. I get help from the Safaricom about AIRTEL MONEY when I need it.
(Nikihitaji msaada kutoka Safaricom kuhusu AIRTEL MONEY, ninasaidiwa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

17. Agents are available for me to use AIRTEL MONEY
(Agents wa AIRTEL MONEY wako karibu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

PERCEIVED TRUST

18. If I made a mistake or lost my phone, the AIRTEL MONEY safeguards my money and information.
(Nikifanya makosa wakati ninatumia AIRTEL MONEY, kila kitu kitahifadhiwa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

19. My financial information is safe when I use AIRTEL MONEY
(Hakuna mtu anaweza kuona habari ya fedha zangu ninapotumia AIRTEL MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

20. People working and managing AIRTEL MONEY can be trusted
(Watu wanaosimamia AIRTEL MONEY wanaaminika)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

TRANSACTION COST

21. The transaction costs for AIRTEL MONEY are too high

(Gharama ya kutumia AIRTEL MONEY iko juu sana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

22. Sometimes I don't send money because sending AIRTEL MONEY is expensive.

(Wakati mwingine situmi pesa kwa sababu kitumia AIRTEL MONEY ina gharama ya juu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

23. AIRTEL MONEY is cheaper than Western Union and Banks.

IF THEY NEVER USED THESE CHANNELS, COMPARE IT WITH TRAVELLING BY MATATU TO TAKE THE MONEY TO RECIPIENT

(AIRTEL MONEY ina gharama ya chini kuliko Western Union ama Benki)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

TRIAL-ABILITY

24. I encourage new users to try AIRTEL MONEY with little money, before starting to use it.

(Ninawashauri watu wajaribu AIRTEL MONEY na pesa kidodo, kabla waanze kuitumia kabisa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

25. I tried out the AIRTEL MONEY service I use before adopting it fully

(nilijaribu AIRTEL MONEY nione iwapo inafanya kazi vizuri kabla sijaitumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

26. If I try other services like Orange Money or Airtel Money etc for free, I could end up using them.

(Nikijaribu Orange Money ama Airtel Money, bila malipo kwanza, huenda nikaanza kuzitumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

MODERATORS

PERCEIVED RISK

27. Transacting in AIRTEL MONEY is risky, the information I send can be accessed by other people.
(Kuna hatari nikitumia AIRTEL MONEY, ujumbe ninaotuma unaweza kujulikana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

28. The cash I put in AIRTEL MONEY could possibly get lost.
(Pesa nilizoweka kwa AIRTEL MONEY zaweza kupotea)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

29. The AIRTEL MONEY technology can fail, e.g. the network collapse
(Teknologia ya AIRTEL MONEY inaweza kuharibiba wakati wowote)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

ENDOGENOUS VARIABLES

BEHAVIORAL INTENTION

30. I intend to use AIRTEL MONEY in the near future
(Nanuia kutumia AIRTEL MONEY hivi karibuni)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

31. I recommend people to use AIRTEL MONEY
(ninawahimiza watu kutumia AIRTEL MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

C: ORANGE MONEY

DEMOGRAPHICS

2. **Gender :**

[__] Male [__] Female

3. **Age :**

Kindly indicate your year of birth _____

4. **Highest education level:**

Kindly indicate last class attended during your schooling_____

5. **How long have you used ORANGE MONEY**

[__] < 6 months

[__] 6 months to ONE year

[__] ONE year to TWO years

[__] TWO years to THREE years

[__] THREE years to FOUR years

DETERMINANTS

PERFORMANCE EXPECTANCY

6. ORANGE MONEY is very useful in managing my finances.
(ORANGE MONEY inanisaidia kuhifadhi na kupanga fedha zangu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

7. I don't need to go to bank frequently because I use ORANGE MONEY
(Sihitaji kutembelea banki mara kwa mara kwa sababu niko na ORANGE MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

8. I save time by using ORANGE MONEY. *(ORANGE MONEY hunisaidia kuokoa mda)*

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

EFFORT EXPECTANCY

9. ORANGE MONEY was easy to learn

(ORANGE MONEY ilikuwa rahisi kujifunza)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

10. ORANGE MONEY is easy to use

(ORANGE MONEY ni rahisi kutumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

11. The registration process for ORANGE MONEY was simple and easy

(Mpangilio wa kusajiliwa kwa ORANGE MONEY ulikuwa rahisi na wa kueleweka)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

SOCIAL INFLUENCE

12. My parents, siblings and friends think that I should use ORANGE MONEY.

(Wazazi, ndugu zangu na marafiki wanaona ni vyema nitumie ORANGE MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

13. My friends use ORANGE MONEY.

(Marafiki wangu hutumia ORANGE MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

14. Using ORANGE MONEY makes me feel better than those who do not use it.

(Nikitumia ORANGE MONEY najihisi vyema kuliko wasiotumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

FACILITATING CONDITIONS

15. I know how to use ORANGE MONEY very well.
(Najua kutumia ORANGE MONEY vizuri sana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
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16. I get help from the Safaricom about ORANGE MONEY when I need it.
(Nikihitaji msaada kutoka Safaricom kuhusu ORANGE MONEY, ninasaidiwa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
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17. Agents are available for me to use ORANGE MONEY
(Agents wa ORANGE MONEY wako karibu)

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[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

PERCEIVED TRUST

18. If I made a mistake or lost my phone, the ORANGE MONEY safeguards my money and information.
(Nikifanya makosa wakati ninatumia ORANGE MONEY, kila kitu kitahifadhiwa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
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19. My financial information is safe when I use ORANGE MONEY
(Hakuna mtu anaweza kuona habari ya fedha zangu ninapotumia ORANGE MONEY)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
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20. People working and managing ORANGE MONEY can be trusted
(Watu wanaosimamia ORANGE MONEY wanaaminika)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

TRANSACTION COST

21. The transaction costs for ORANGE MONEY are too high

(Gharama ya kutumia ORANGE MONEY iko juu sana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

22. Sometimes I don't send money because sending ORANGE MONEY is expensive.

(Wakati mwingine situmi pesa kwa sababu kitumia ORANGE MONEY ina gharama ya juu)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

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23. ORANGE MONEY is cheaper than Western Union and Banks.

IF THEY NEVER USED THESE CHANNELS, COMPARE IT WITH TRAVELLING BY MATATU TO TAKE THE MONEY TO RECIPIENT

(ORANGE MONEY ina gharama ya chini kuliko Western Union ama Benki)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

TRIAL-ABILITY

24. I encourage new users to try ORANGE MONEY with little money, before starting to use it.

(Ninawashauri watu wajaribu ORANGE MONEY na pesa kidodo, kabla waanze kuitumia kabisa)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

25. I tried out the ORANGE MONEY service I use before adopting it fully

(nilijaribu ORANGE MONEY nione iwapo inafanya kazi vizuri kabla sijaitumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

26. If I try other services like Orange Money or ORANGE MONEY etc for free, I could end up using them.

(Nikijaribu Orange Money ama ORANGE MONEY, bila malipo kwanza, huenda nikaanza kuzitumia)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)

[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

MODERATORS

PERCEIVED RISK

27. Transacting in ORANGE MONEY is risky, the information I send can be accessed by other people.
(Kuna hatari nikitumia ORANGE MONEY, ujumbe ninaotuma unaweza kujulikana)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

28. The cash I put in ORANGE MONEY could possibly get lost.
(Pesa nilizoweka kwa ORANGE MONEY zaweza kupotea)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

29. The ORANGE MONEY technology can fail, e.g. the network collapse
(Teknologia ya ORANGE MONEY inaweza kuharibiba wakati wowote)

[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

ENDOGENOUS VARIABLES

BEHAVIORAL INTENTION

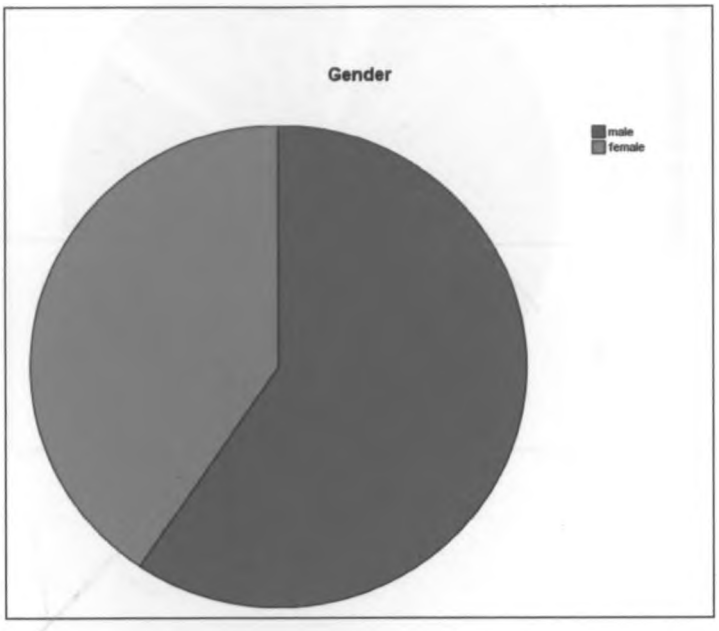
30. I intend to use ORANGE MONEY in the near future
(Nanuia kutumia ORANGE MONEY hivi karibuni)

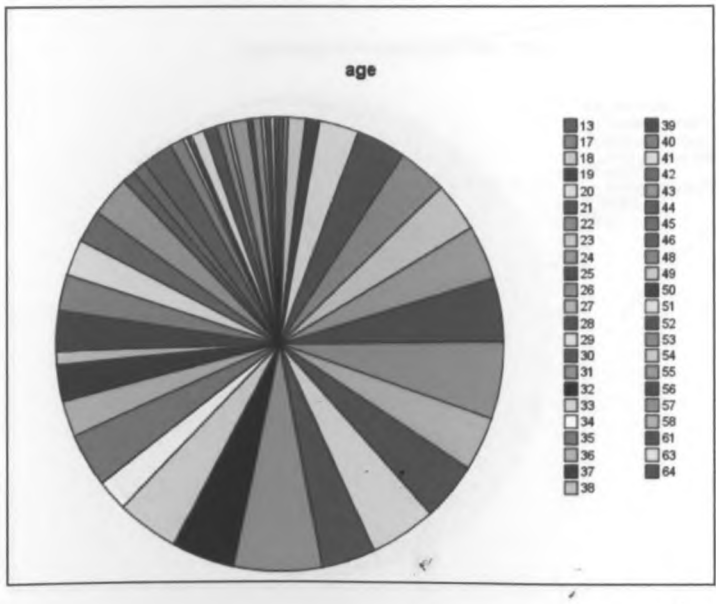
[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

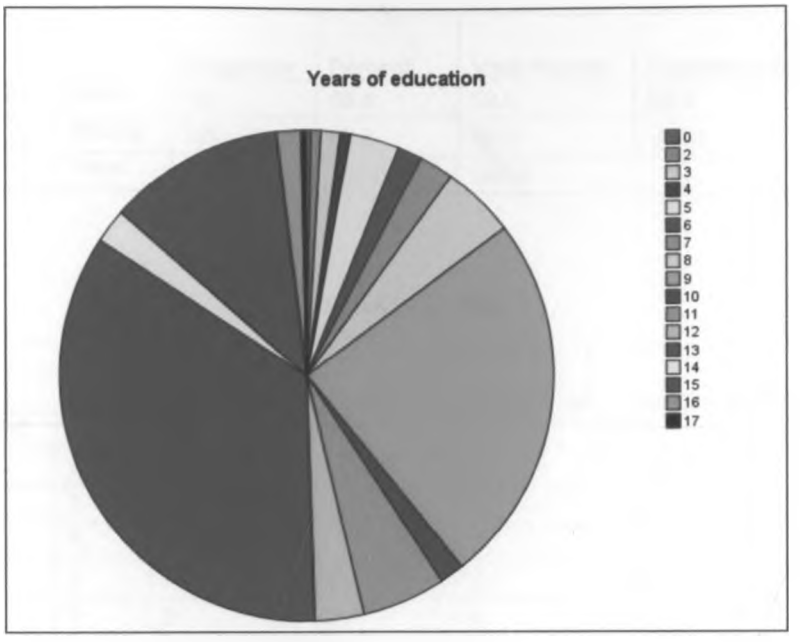
31. I recommend people to use ORANGE MONEY
(ninawahimiza watu kutumia ORANGE MONEY)

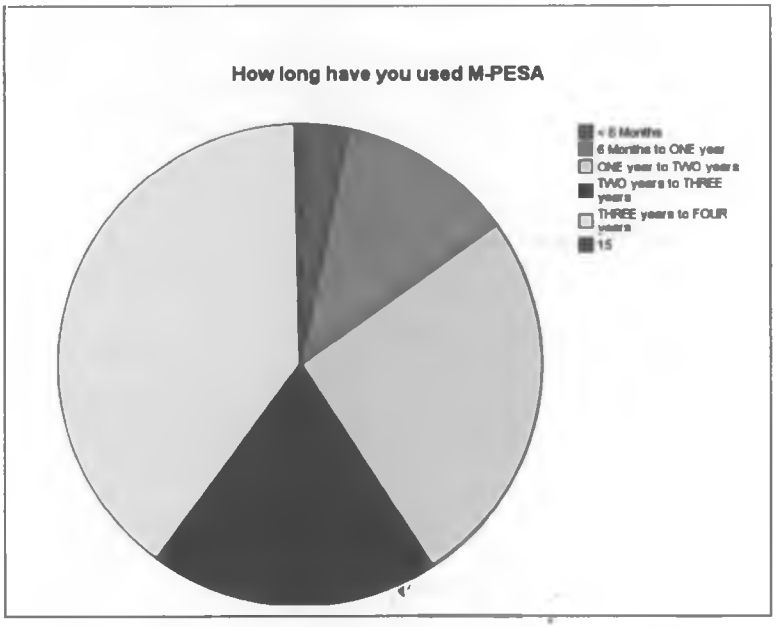
[__] Strongly disagree (*Sikubali Kabisa*) [__] Disagree (*Sikubali*) [__] Neutral (*Siamui*)
[__] Agree (*Nakubali*) [__] Strongly agree (*Nakubali Kabisa*)

APPENDIX C: TABLES OF ANALYSIS AND CHARTS






Years of education
0
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17


How long have you used M-PESA
< 6 Months
6 Months to ONE year
ONE year to TWO years
TWO years to THREE years
THREE years to FOUR years
15

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	185	59.5	59.5	59.5
	female	126	40.5	40.5	100.0
	Total	311	100.0	100.0	

Years of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1	.3	.3	.3
	2	2	.6	.6	1.0
	3	4	1.3	1.3	2.3
	4	2	.6	.6	2.9
	5	10	3.2	3.2	6.1
	6	5	1.6	1.6	7.7
	7	7	2.3	2.3	10.0
	8	15	4.8	4.8	14.8
	9	76	24.4	24.4	39.2
	10	5	1.6	1.6	40.8
	11	17	5.5	5.5	46.3
	12	10	3.2	3.2	49.5
	13	108	34.7	34.7	84.2
	14	7	2.3	2.3	86.5
	15	36	11.6	11.6	98.1
	16	5	1.6	1.6	99.7
	17	1	.3	.3	100.0
	Total	311	100.0	100.0	

How long have you used M-PESA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 6 Months	10	3.2	3.2	3.2
	6 Months to ONE year	37	11.9	11.9	15.1
	ONE year to TWO years	80	25.7	25.7	40.8
	TWO years to THREE years	60	19.3	19.3	60.1
	THREE years to FOUR years	123	39.5	39.5	99.7
	15	1	.3	.3	100.0
	Total	311	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	13	1	.3	.3	.3
	17	1	.3	.3	.6
	18	4	1.3	1.3	1.9
	19	3	1.0	1.0	2.9
	20	9	2.9	2.9	5.8
	21	11	3.5	3.5	9.3
	22	11	3.5	3.5	12.9
	23	11	3.5	3.5	16.4
	24	12	3.9	3.9	20.3
	25	14	4.5	4.5	24.8
	26	17	5.5	5.5	30.2
	27	12	3.9	3.9	34.1
	28	13	4.2	4.2	38.3
	29	15	4.8	4.8	43.1
	30	12	3.9	3.9	46.9
	31	20	6.4	6.4	53.4
	32	14	4.5	4.5	57.9
	33	14	4.5	4.5	62.4
	34	7	2.3	2.3	64.6
	35	12	3.9	3.9	68.5
	36	8	2.6	2.6	71.1
	37	8	2.6	2.6	73.6
	38	3	1.0	1.0	74.6
	39	9	2.9	2.9	77.5
	40	8	2.6	2.6	80.1
	41	8	2.6	2.6	82.6
	42	7	2.3	2.3	84.9
	43	9	2.9	2.9	87.8
	44	3	1.0	1.0	88.7
	45	3	1.0	1.0	89.7
	46	7	2.3	2.3	92.0
	48	3	1.0	1.0	92.9
	49	1	.3	.3	93.2
	50	1	.3	.3	93.6
	51	3	1.0	1.0	94.5
	52	3	1.0	1.0	95.5
	53	2	.6	.6	96.1
	54	1	.3	.3	96.5

		Frequency	Percent	Valid Percent	Cumulative Percent
	55	4	1.3	1.3	97.7
	56	1	.3	.3	98.1
	57	2	.6	.6	98.7
	58	1	.3	.3	99.0
	61	1	.3	.3	99.4
	63	1	.3	.3	99.7
	64	1	.3	.3	100.0
	Total	311	100.0	100.0	