DETERMINANTS OF USER CONTINUANCE INTENTION TOWARDS MOBILE MONEY SERVICES: THE CASE OF M-PESA IN KENYA

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DEDICATION

TO MOM AND DAD,

OVIE, JOSHUA, OFIEN, UKARI, AND IZI

FOR YOUR UNWAVERING LOVE, GUIDANCE AND SUPPORT

THIS THESIS IS DEDICATED TO YOU

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PROLOGUE

Part of this thesis has been accepted for the 5th international conference on financial services and will be presented at the conference in September 2015. Following presentation, it will be considered for publication in the Journal of Economic and Management Studies- special issue on financial services in Africa, and in the Southern African Business Review- special conference issue.

The endorsement by the academic community has provided bearing and motivation to the production of this thesis.

STATEMENT OF AUTHENTICATION

The work presented in this thesis is my own unaided work, and is, to the best of my knowledge and belief, original, except as acknowledged in the text. I hereby declare that I have not submitted this material, either in whole or in part, for a degree at this or any other institution.

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(Signature)

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(Date)

ABSTRACT

The turn of the millennium witnessed the uptake and proliferation of mobile technology in developing regions. This occurrence has provided a medium for mobile telecommunication vendors within the region to create and offer services that are now accessible across socio-economic classes. A notable case of a widely adopted mobile technology-enabled service in the developing world is a mobile money service in Kenya called M-pesa. Since its inception, M-pesa has witnessed a mass adoption which has generally been attributed to prior lack of access by majority of individuals' in the country to affordable regulated financial services. M-pesa's presence has now been anticipated to afford a larger population the initial opportunity to harness economic benefits such as: increase money circulation, increase employment opportunities, facilitate social capital accumulation, facilitate savings, and promote financial autonomy, amongst others. Also, M-pesa based transactions in Kenya are reported to exceed those of western union globally. Whilst M-pesa presently vaunts large user adoption numbers, it is the first of its kind in the region to amass such achievement. Further, historically: products and services of similar nature to M-pesa have been unsustainable. A case of M-pesa's demise would have dire implication for the Kenyan economy and 30% of the households in the country that rely on it for remittances. To understand this phenomenon, extant studies have examined the drivers of adoption of this service but have slacked in subsequent investigations to understand user continuance with the service. As such, the information systems literature cautions that initial adoption of technology, although crucial, does not guarantee sustained use. Therefore it is imperative to investigate drivers of continuance.

In general, extant research has not focused on investigations of user continuance intention in Africa. In response, this thesis presents an African based study on the determinants of user continuance intention towards M-pesa. Specifically, the purpose of this study was to i) identify and discuss factors from the literature that are most likely to influence user continuance intention towards M-pesa, (ii) develop a research model that is grounded in theory, (iii) test the model within the sample context to identify the antecedents and determinants of user continuance intention towards M-pesa in Kenya.

A broad, critical review of the relevant literature provided basis for hypothesized relationships between the identified factors. A formal survey of users of M-pesa in Kenya

comprised the phase of data collection and resulted in a usable data set of (n=434). The data collected from the respondents within Kenya was relied upon to test the hypotheses.

The survey instrument used to measure the study's constructs was developed via a process of literature review, expert pre-testing, pilot testing, and statistical validation.

Partial Least Square and Artificial Neural Network analyses were used to examine the study's measurement and structural model comprising variables of: behavioural beliefs (*post-usage usefulness, confirmation, satisfaction*), control-beliefs (*utilization and flow*), object-based beliefs (*perceived task-technology fit*, *system quality, information quality, and service quality*), and attitudinal belief (*trust*). Collectively, the afore-listed ten independent variables and one dependent variable (*continuance intention*) comprised the study's model.

Four of the independent variables (utilization, satisfaction, flow, and trust) were hypothesized to directly determine continuance intention. Of these four, all emerged as determinants of continuance intention. However, trust emerged as the strongest determinant, subsequently, utilization, flow, and satisfaction respectively. The result was unexpected, as satisfaction (a behavioural belief) has been presented in the extant literature as the dominant determinant of continuance intention but does not hold a consistent predictive strength in a developing world. Its predictive power was diluted by trust, utilization, and flow amongst the Kenyan sample. The study's model revealed an R^2 of 0.334.

The analyses demonstrated that user continuance intention is determined by factors across object, control, attitudinal, and behavioural beliefs. The unexpected finding of the rankings of predictive strength of the factors turns a new leaf and introduces areas of further inquiry in future studies.

The study concludes with realized contributions to theory and important guidelines for current and future technology-enabled service vendors in developing regions.

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All are lunatics, but he who can analyze his delusions is called a philosopher~

Ambrose Bierce.

1. INTRODUCTION

"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things"~ **Niccolo Machiavelli**

1.1 Background to the Study

There is few, if any, technology that has impacted the world today as rapidly as the mobile phone (Greengard, 2008; McManus, Carr, & Adams, 2011; Rotberg & Aker, 2013; GSMA[1], 2013a, GSMA, 2014). Over half of the world's population now have access to a mobile phone; approximately 3.2 billion individuals (GSMA, 2013a). The proliferation of the mobile phone across diverse consumer brackets and regions has created a technology-enabled avenue to provide a range of services to previously unreached groups in society, specifically, the developing regions[2]. One of such services is access to finance through the mobile phone, and this is now accessible by more individuals in developing regions. A recent report by the World Bank (2015) states that about two billion adults still lack access to formal bank accounts, with the preponderance comprising individuals' in the developing world. As such, the World Bank (2015) reports that 38% of the adult population globally still endure privation of basic financial services that would facilitate saving, borrowing, and transacting. Nontheless, GSMA (2015) declares that the use of mobile phones for transactions is on the rise, with over 100 million users as of December 2014, against 73 million in December 2013. The increasing availability and use of mobile technology amongst individuals' in this part of the world has possibly induced the conception, uptake, and proliferation of a financial service known as M-pesa[3].

[1] Global Systems Mobile Association (GSMA) is a union of mobile operators and similar groups, assigned to support, standardize, deploy, and promote the application and use of global systems mobile services.

[2] Developing regions refer to nations with lower levels of wealth, rudimantary industrial assets, and low person development capacity compared to other nations (Arthur & Sheffrin, 2003).

[3] M-pesa: M-stands for mobile, while pesa means money in Swahili (M-pesa = mobile money) is a mobile technology-enabled money transfer service which affords its users' privileges to make cash transfers to any mobile phone user within a specified geographical region.(See graphical illustration of M-pesa use in Section 8: Appendix 1, 2, 3)

M-pesa was launched in Kenya, in March 2007, by 'Safaricom[4]', and has since witnessed exponential growth. The service started off with a consumer base of 20,000 users within a month (Hughes & Lonie, 2007), 8.6 million users within two years (Safaricom, 2009), and by the year 2012, they had about 17 million users, in Kenya only (Communications Commission of Kenya (CCK), 2012). M-pesa is also available in other African countries such as Tanzania[5], South Africa[6], and more recently the Democratic Republic of Congo[7], Egypt, Lesotho, and Mozambique, in the Australia's (Fiji[8]), in the Middle-East (Afghanistan[9]), and in Asia (India[10]). However, the consumer base in Kenya is the largest amongst all countries where the service is offered. The user growth trend in Kenya strongly suggests that a gap in the financial services market in the country has been filled by an ex-ante unconventional service delivery medium to the masses.

To this end, there is mounting interest in academic and practitioner communities around the globe in understanding ways through which a service such as this can be sustained (GSMA 2013a; Demombynes & Thegaya, 2012). This found interest possibly results from: (i) the large population of the globes yearn for the social and economic benefits that mobile technology provides yet lack access to it: revealing gaps and prospects for vendors to bridge (ii) Prior innovations of financial services targeted at the majority of individuals' in developing regions have historically been unsustainable.

1.2 Research Problem

A notable gap still exists in the extant literature on use of technology-enabled products and services in developing regions. To elucidate this, leading developing country researchers': Walsham, Robey, & Sahay (2007) opine that this occurrence was partly due to past debates about

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[4] Safaricom is the leading mobile telecommunications service provider in Kenya (Ntara, 2015).

[5] http://www.telegeography.com/products/commsupdate/articles/2013/05/02/vodacom-tanzania-reports-five-million-m-pesa-subs-transactions-top-usd823m/

[6] http://www.techcentral.co.za/m-pesa-disappoints-for-vodacom-sa/23167/

[7] http://www.vodafone.com/content/sustainability/transformationalsolutions/finance.html

[8] www.ventures-africa.com/2014/02/moneygram-vodafone-mpesa-to-service-developing-world

[9] http://www.vodafone.com/start/media_relations/news/group_press_releases/2007/vodafone_and_roshan.html

[10] http://www.mbuguanjihia.com/2009/what-you-dont-now-about-mpesa.html

the relevance of Information Communication Technology (ICT) in these regions; a debate which has now been resolved clearly in the affirmative. Attention has now been turned from whether, to how ICT's may be applied to enhance the aforesaid regions (Walsham et al. 2007).

The proliferation of M-pesa amongst the Kenyan population illustrates the relevance of an ICT (mobile-technology) in transforming a sector in a developing nation. On mobile money, a relatively recent study by the GSMA (2012) reports that there are now over 150 mobile money vendors in developing regions, and 41 of these services commenced operations in 2012. The GSMA (2012) further notes that only six amongst the 150 mobile money vendors have an active customer base of over one million users, and that three of these six only attained this level between the months of June 2011 and June 2012. Collectively, the aforementioned statistics show that M-pesa's performance since inception and consumer base of 17 million in Kenya far exceeds other extant mobile money initiatives. Also notable, the GSMA (2012) underlines that the number of mobile money accounts now exceed bank accounts in Kenya.

The availability of alternative services introduces a new challenge for an existing vendor as usage continuance may be threatened, and a need to understand consumer preference towards prior existing services is vital (Devaraj, Fan, & Kohli, 2002; Yang, Lu, Chen, & Gupta, 2014). Within the study's context, the availability of alternative mobile money services (MMS) presents a potential quandary for both current users and vendors: current users are challenged because when presented with a range of options, a user may desire to switch service, but will be faced with various dimensions of switching cost (e.g., uncertainty cost, sunk cost, lost performance cost, post switching behavioural & cognitive cost, setup cost, pre-switching search & evaluation cost) (Jones, Mothersbaugh, & Beatty, 2002; Blut, Evanschitzky, Backhaus, Rudd, & Marck, 2015). These costs are psychologically, monetary, and time consuming in changing from one alternative to another. However, they will be overcome if a substitute product or vendor is compelling in providing superior innovative offerings. Conversely, vendors will be concerned because consumer behaviour studies suggest that consumers will continue to use a service in the presence of alternatives only if the benefits outweigh the cost (Shih, 2012). Thus service providers are now tasked with managing customer perceptions of switching cost to foster continuance with their services. A vendor's ability to control switching perceptions is therefore considered a powerful and tactical element in nurturing continuity with a product or service.

Mindful of this, M-pesa does not seem to be currently threatened as inferred in reports by the GSMA (2012). However, given that prior products and services of similar nature to M-pesa (e.g., Wizzit) in developing regions have been unsustainable (Nobel, 2011), it is of precautionary and long-term value to understand the factors that drive user continuance intention towards this technology-enabled service. This would counteract a possible ephemeral success story. Further, a focus on M-pesa is key because its current position as the leading mobile money vendor affords a larger population of users in the region the initial opportunity to harness economic benefits such as: increase money circulation (Demombynes & Thegaya, 2012), increase employment opportunities (Plyler, Haas, & Nagarajan, 2010), facilitate social capital accumulation (Morawczynski, 2008, Plyler et al. 2010) facilitate savings (Demombynes & Thegaya, 2012), and promote financial autonomy (Morawczynski, 2009), amongst others. Of utmost value, a need to understand user continuance intention is crucial because the user growth trend of M-pesa in Kenya presents an opportunity for the vendor to bolster an institutional establishment, yet the ability of this vendor to succeed in fostering usage continuance will be hampered by a lack of understanding of the factors that promote or inhibit user intention to continue using the service.

Additionally, although Kenya currently vaunts of the successful adoption and use of M-pesa in the country, several eminent scholars (Bhattacherjee, Perols, & Sanford, 2008; Kim & Malhotra, 2005; Venkatesh, Morris, Davis, & Davis, 2003, Bhattacherjee, 2001a; Bhattacherjee & Lin, 2014) caution on user continuance with technology: that while initial acceptance of a technology-enabled service is crucial, long-term viability and success is only realised in the continuous use of the service. Expounding on this view, Venkatesh & Goyal (2010) write that users could form positive preliminary judgments about a technology-enabled service, and that these beliefs could be altered over time, prompting the user to discontinue the use of the technology after initial use. The aforementioned scholars' view suggests that an investigation into possible factors that promote or inhibit usage continuance with mobile money initiatives would serve as the cornerstone for sustained use of the service. In similar vein, Bhattacherjee et al. (2008) underline that it is less expensive for technology vendors to retain existing users' than to attract new ones; implying that the sustenance and success of a technology-enabled service is reliant on a vendor's ability to attract new customers while retaining older ones.

In sum, the researcher proposes this predictive study to inform strategies required to sustain and also attract potential users of MMS. Equally, the researcher asserts that we should err on the side of caution as recommended in the extant literature, presuming that the initial success of M-pesa

amongst the Kenyan population does not guarantee a sustained use of the service. It is therefore imperative for the Information Systems (IS) research and practitioner community to understand the initial acceptance and possible discontinuance anomaly amongst users of the M-pesa service.

1.3 Problem Statement

To comprehend the continuance intention of mobile money users in a developing country context, a study that identifies and tests the determinants of usage continuance amongst this population is vital. Aforesaid, M-pesa has been selected as the subject of focus because of its current market position and its potential to more rapidly enable the region to attain economic benefits. As such, an undertaking of this study will provide an empirically informed understanding of factors that influence usage continuance of MMS in the region. As it stands- to the best of the researcher's knowledge, there is scant record of studies that have been conducted on user continuance intention towards MMS in Africa. This void in the literature stands to hamper our understanding of the probable factors that could promote or inhibit user continued use of MMS in the region.

Further, a study by Buku and Meredith (2013, p. 7) outlines the impact of M-pesa in Kenya, and highlights that '30% of households in Kenya depend on M-pesa remittances for survival.' As such, M-pesa as a channel for financial transactions propels the GDP of the Kenyan economy. If only to this end, should the IS research and practitioner community neglect this phenomenon on continuance with MMS in the region, there could be dire consequences for these dependents, should positive usage beliefs towards M-pesa be altered. Particularly, dependents on M-pesa service could risk losing their livelihood. Last, we risk current and future investors venturing into futile investments, and promotions that are ill informed which in turn affects the investment portfolios for sustainability of service delivery to this consumer group. Thus this study's investigation is imperative to bridge this gap in the literature, by providing empirical reference to promote use and counteract possible user retraction towards MMS.

1.4 Research Questions (RQ)

Against the study's backdrop, the RQs explored in this thesis are as follows:

The first RQ focuses at a theoretical level and aims to identify within the literature, potential antecedents of user intention to continue using MMS in Kenya. Thus the following RQ is posed:

RQ1) what are the antecedents of user continuance intention towards M-pesa in Kenya?

The second RQ focuses at an empirical level and models and tests the identified antecedents, to ascertain determinants of user continuance intention towards mobile money in Kenya. Thus the following RQ is posed:

RQ2) what are the determinants of user continuance intention towards M-pesa in Kenya?

1.5 Aims and Objectives

The primary aim of this study is to contribute to the development and empirical validation of a comprehensive model of user continuance intention towards mobile technology-enabled services in developing regions, and this requires the identification of suitable validated factors in the literature. The methods and objectives employed in this study are as follows:

To answer the first RQ, the researcher will:

- Review the extant literature on m-commerce, consumer behaviour, and computing behaviour in light of continuance intention.
- Identify and discuss the relevant theoretical underpinnings for the study.
- Identify and discuss the individual level factors from the literature that are most likely to influence user continuance intention towards M-pesa.
- Adopt a framework to categorize the identified factors posited to influence user continuance intention towards M-pesa.
- Develop a research model that is grounded in theory

- To answer the second RQ, the researcher will:

  - Identify communities in Kenya that have access to M-pesa and the inhabitants' are users of the service.
  - Operationalize the variables in the hypothesized research model.
  - Develop a survey instrument to collect data from individual users' of M-pesa in the identified communities in Kenya.
  - Distribute the survey instrument using an intercept protocol.
  - Test the model within the sample context- Kenya, using Partial Least Squares (PLS) - Structural Equation Modelling (SEM) and Artificial Neural Networks (ANN).
  - Report on the findings

- Last, the study will discuss and reflect on the theoretical and practical implications of the findings, and recommendations for future studies on user continuance intention.

1.6 Contribution of the Study

This study's contribution varies across stakeholders:

First, it makes a theoretical contribution to the IS academic community by integrating suitable theories and models within the IS and psychology literature to better explain continuance intention towards MMS in developing regions. This is attained by identifying factors in the literature that are assumed to transcend culture and time, explaining the factors, developing a model that consists of the identified factors, testing the model, and reporting on an empirically validated model that further explains a fraction of the continuance phenomenon. Ten factors (perceived task-technology fit, utilization, post-usage usefulness, confirmation, satisfaction, system quality, information quality, service quality, flow, and trust) across beliefs of behavioral, control, object-based, and attitudinal were integrated into a model and twenty hypothesized

relationships amongst these variables were presented and tested. A key theoretical contribution realized from this study is the order of influence of these beliefs on continuance intention. Conventional wisdom in the IS literature holds that satisfaction- a behavioral belief is the dominant predictor of continuance intention. This study's results contests the status quo, as amongst four hypothesized determinants (utilization, satisfaction, flow, and trust) of continuance intention, satisfaction held the least predictive power. Unexpectedly, the predictive strength of trust, utilization, and flow, respectively exceeded satisfactions dominance. Thus, a contribution to theory is the realization and value of integrating beliefs of control, behaviour, attitude, and object- to explain user continuance intention. Additionally, the model developed in this study presents an interesting lens in examining individual's continuance intention logic in developing regions and can be replicated and tested by studies in the IS discipline and sub-disciplines of IS, such as information communication technology for development (ICT4D), and mobile for development (M4D).

Second, it makes a practical contribution to the IS community by presenting current and prospective investors in the mobile technology service industry in the developing world with empirical evidence of factors they should focus on to retain current users' and to attract prospective users of MMS. Further, it provides entrepreneurs who aspire to provide value added services on mobile devices, information to tailor their innovations within the framework of empirically informed drivers. In turn, consumers' in these regions stand to have sustained mobile technology-enabled services that cater for their needs. Practically, a post-hoc examination of importance performance matrix was conducted on the study's model to unite customers (importance) and vendors (performance) perspectives in assessing the relative improvement priorities that should be applied to develop competitiveness. The results showed that all variables in the study's model are important, albeit of varying degrees, and performance of some factors are good while others require improvement. A detailed discussion of the practical contributions of this study is presented in chapter 6.

Third, a methodological contribution is made by employing a multi-analytic approach which combines SEM and ANN. SEM is used to examine the study's measurement and structural model. Thereafter, ANN is used to verify the determinants of user continuance intention towards M-pesa.

1.7 Philosophical Underpinnings of the study

The objective of this study is to model and test the determinants of user continuance intention towards mobile technology-enabled services in a developing region. The strategy is to identify suggested factors in the literature that are most likely to influence continuance intention of individuals' in the aforesaid region, and necessitates the testing of hypothesized relationships. Therefore, this study is a hypothetico-deductive scientific approach to research and aligns with empirical positivism. In this study, the constructs informing the model's development are derived and operationalized from the literature. The relationships between the factors are framed and tested in form of hypothesis. The empirical aspect of the study employs cross-sectional survey with structured questionnaires as the instrument of data collection. To test hypothesized relationships, data is submitted to quantitative methods of multivariate data analysis. The survey approach adopted for data collection is characterized by the use of key informants (users of M-pesa) as survey respondents. A cautionary note is that although respondents' objectivity is desired, surveys may uncover respondents' subjective perceptions which may affect results.

A more detailed discussion on the philosophical underpinnings of the study is discussed in chapter 4- research methodology section.

1.8 Structure of the Thesis

This thesis is organized into six chapters:

Chapter 1- Introduction

This chapter presents a background to the study, research problem for investigation, problem statement, RQ's to guide the investigation of this study, aims and objectives of the study, intended contributions of the study, philosophical underpinnings of the study, and the structure of the thesis.

Chapter 2- Research Issues

This chapter positions the examination of M-pesa use within the framework of ICT4D. Through technological lens, it describes the development levels in Africa- Kenya's continental base, examines mobile subscriptions levels- the technology enabler of M-pesa, chronicles of mobile finance in Africa, provides relevant contextual backdrop on Kenya, discusses consumer behaviour

towards technology, and motivates for a model-based approach for explaining user continuance intention towards M-pesa.

Chapter 3- Theoretical Perspective

This chapter develops a theoretical model of user continuance intention towards MMS. It presents guidelines adopted for the model development, reviews context related models and theories on user continuance and selects appropriate constructs to develop the study's research model. Thereafter, it presents the proposed theoretical model, and uses the model to structure a set of research hypotheses to be tested.

Chapter 4 – Research Methodology

This chapter details the research design and presents the strategy for the study. Specifically, ontological, epistemological, and methodological perspectives are presented. Thereafter, an overview of research settings and data collection procedures, data collection sites, measurement instrument, and data analyses techniques are discussed.

Chapter 5- Data Analysis and Results

This chapter presents the analyses and results of data obtained for the study. It captures the response rate of the data collection phase, data treatment techniques, descriptive of the data collected, measurement model analysis, and structural model analysis. Further to an analysis of the measurement and structural model, it presents some post-hoc analyses, such as: importance performance matrix analysis, mediator analysis, and moderator analysis.

Chapter 6- Discussion and Conclusion

This chapter provides a discussion of the results and a conclusion to the thesis. It provides answers to the RQ's, presents the contributions of this thesis to theory and practice, outlines the study's strengths and limitations, and suggests future research directions. Finally, the chapter ends with concluding notes.

2. RESEARCH ISSUES

"He who forgets the past is condemned to repeat it"~ ***Paul Christopher***

The previous chapter introduced the research agenda and outlined its importance and contributions. This chapter situates the examination of M-pesa use within the framework of ICT4D. From a technology standpoint, it describes the development levels in Africa- Kenya's continental base, discusses mobile subscriptions levels- the technology enabler of M-pesa, history of mobile finance in Africa, provides relevant contextual background information on Kenya, discusses consumer behaviour towards technology, and motivates for a theoretical approach for explaining user continuance intention towards M-pesa.

2.1 Contextual Overview of Research Issues

There is increasing adoption and use of mobile devices in developing regions, and this occurrence is steadily being exploited by organizations to provide new services to previously excluded and unreached consumer groups (Gruber & Koutroumpis, 2010; Tobbin & Kuwornu, 2011, p.59). The financial sector seems to be one that has benefitted from the proliferation of mobile technology across the region, as would be outlined shortly. Hughes and Lonie (2007) report that there are over two billion mobile phone users in developing countries and that this figure exceeds the number of banked individuals' in the region. A recent continental and regional specific statistic by Rotberg and Aker (2012) reports that there are over 500 million mobile phone users in sub-Saharan Africa[11]; where Kenya is situated. This phenomenon has impelled several telecom vendors to offer services through this medium to previously unreached consumer groups. Amongst services now provided via mobile phones, the use of mobile money is notable, as the GSMA (2012) reports the existence of over 150 mobile money vendors in developing regions. Although these are remarkable statistics, the GSMA (2012) cautions that various mobile money vendors are at different stages of their service implementation. The GSMA's (2012) note implicates that for an accurate assessment of mobile money in the region, an analysis at the vendor level of services is required.

[11] Sub-Saharan Africa refers to the geographical space of the African continent that lies south of the Sahara desert.

To conduct an empirical assessment of mobile money use, it is essential to understand the existing protocol in investigating such a phenomenon. The systematic approach in the extant literature for investigating technology adoption and use is carried out in two phases: the first phase focuses at an acceptance level: adoption and intention to use, while the second phase focuses at the post adoption level: continuance intention, continuance behaviours, and performance impacts (Larsen, Sorebo, & Sorebo, 2009). The first phase- adoption behaviour, investigates user readiness or intention to use a technology within a period of opening (Davis, 1989). The second phase- post adoption (continuance intention, behaviour, performance impacts) investigates aggregated perceptions and experiences following a time period after initial use (Bhattacherjee, 2001a). The majority of prior studies on technology use have focused on factors that drive initial adoption, and have often paid less attention to investigating factors that promote or inhibit continued use. This occurrence prompted a number of researchers (Parthasarathy & Bhattacherjee, 1998; Karahanna, Straub, & Chervany, 1999; Bhattacherjee, 2001a; Jasperson, Carter, & Zmud, 2005; De Guinea & Markus, 2009; Bhattacherjee & Barfar, 2011; Bhattacherjee & Lin, 2014) in the IS field to call for investigations towards a better understanding of post adoption intention and behaviour towards technology. The cornerstone of post-adoption studies asserts that consumer initial perception towards a technology may be altered after prospective users actually use the technology. Explicating this position, several authors (Barki & Hartwick, 1994; Hiltz & Turoff, 1981; Kay & Thomas, 1995; Bhattacherjee, 2001a) write that different features of a technology in use could be opposed, treated with indifference, used limitedly, or routinized; implying that post-adoption use could either intensify or diminish. The former (intensify) is the wish of every service provider because retaining existing users affects profitability of the vendor in the early and later years of its operations (Reichheld & Schefter, 2000). On this note, prior studies by Crego & Schiffrin (1995), on customer centred re-engineering have shown that increasing customer base by 5% could help reduce operating cost by 18%, and can foster increase in profits by 25 – 95%. Further, some scholars (e.g., Reichheld & Sasser, 1990; Reichheld & Schefter, 2000; Fenn, 2010) opine that attracting new consumers may cost five times that of retaining old ones. The implied costs are accrued from additional cost in the search for fresh consumers, creating accounts, and inaugurating the customers to the technology (Reichheld & Sasser, 1990; Parthasarathy & Bhattacherjee, 1998). In sum, an organizations ability to balance customer retention and attraction is an effective strategy for sustaining its services and increasing profits.

More recently (21st century), the issue of continuance has gained anew interest in the IS literature, specifically in investigations of user continuance at the individual level of personalized technology (e.g., mobile devices). Various factors conjectured to influence user continuance have been explored, such as: user satisfaction (Bhattacherjee, 2001a; Limayem, Hirt, & Cheung, 2007; Deng, Turner, Gehling, & Prince, 2010) ; system usage (Cenfetelli, Benbasat, & Al-Natour, 2008; Liao, Palvia, & Chen, 2009; Gefen, Karahanna, & Straub, 2003); trust (Gefen, 2000; Gefen et al. 2003; Qureshi, Fang, Ramsey, McCole, Ibbotson, & Compeau, 2009), Habit (Limayem & Cheung, 2008; De Guinea & Markus, 2009; Bhattacherjee & Lin, 2014), amongst other factors. While each of these factors have been reported to influence usage continuance of a technology, it is important to note that most of these studies have been conducted in developed and BRICS[12] nations. Scant attention has been paid to consumers' in lower developing regions such as majority of the countries in Africa. Nonetheless, events of recent times- proliferation of mobile phones have impelled an integration of developing regions into the global technology market. Afore-noted in chapter one of this study, leading developing country researchers: Walsham et al. (2007) opine that the past debate of the relevance of technology in developing regions has been resolved in the affirmative, and that focus is now on how these technologies can improve the region.

To buttress the arguments by the above scholars, the GSMA's (2013a) report captures the market opportunities being utilized by telecommunication vendors in the region. The report reveals how these vendors are developing strong value added propositions outside their core services and products to improve the region. Some of these value-added services are now extended to the finance, health, and education sectors, amongst others. The GSMA (2013a) also notes that amongst developing regions, the influence of the mobile phone is highlighted in the financial sector (mobile money), and the impact of MMS on communities is particularly evident in the African continent, more specifically, in Kenya; where M-pesa was launched, and adoption and usage of its services has attained phenomenal heights within a short-time period.

The proliferation of M-pesa in Kenya has stirred research interests in understanding the roots of the occurrence and its effects on the society (Demombynes & Thegaya, 2012). On M-pesa, several authors have investigated the phenomenon and presented their findings: for example Kimenyi & Ndung'u (2009) attribute Kenya's conducive legal and tax environment,

[12] Brazil, Russia, India, China, and South Africa (BRICS) is an acronym for an association of the five major emerging national economies

macroeconomic policies, private-public policy dialogue, and an open market, as key enablers of the rapid growth of the service in Kenya; Jack & Suri (2010) investigated the economics of M-pesa in Kenya; Morawczynski & Miscione (2008) wrote a case study on the role of trust in M-pesa; Morawczynski (2009) examined the usage and impact of transformational mobile financial services; Mbiti & Weil (2013) report on the home economics of e-money; Ngugi, Pelowski, & Ogembo (2010) examine the role of early adopters in the rapid adoption of M-pesa; Osah (2012) examined consumer intention to use M-pesa in Kenya and South Africa; Tobbin & Kuwornu (2011) assessed adoption of M-pesa in Ghana. While the areas investigated by the aforesaid studies are all vital contributions towards understanding the M-pesa phenomenon, a critical gap-user continuance intention, still exists in the literature. To the best of the researcher's knowledge, very scant records exist on continuance with technology-enabled products and services in Africa.

In light of the importance of continuance intention, several scholars (e.g., Karahanna et al. 1999; Bhattacherjee, 2001a; Zhou, 2013; Bhattacherjee & Lin, 2014) stress that the ultimate value of a technology-enabled service is fully realized in the continued use of the service and not adoption. The literature on user adoption is a mature stream of IS research (Venkatesh, Thong, & Xu, 2012; Ding, Cha, & Ng, 2012). However, seldom, in comparison to adoption studies, have researchers followed up with investigations that further seek to understand user continuance intention (Bhattacherjee, 2001a; De Guinea & Markus, 2009; Venkatesh & Goyal, 2010). More so, there is less extant studies on consumers' within developing regions.

Of fair note, there is a fast growing body of literature on user continuance intention (Lin, Wu, & Tsai, 2005; Roca, Chiu, & Martinez, 2006; Limayem et al. 2007; Bhattacherjee & Lin, 2014), however, the researcher again turns attention to the void in the literature that has often neglected technology use in developing regions, particularly in Africa. This gap cannot be ignored especially the case of M-pesa, where the service's positive impact has increasingly been felt across Kenya and has the potential to produce a ripple effect across the continent and beyond.

As briefly discussed in the above section, there are a number of studies on technology adoption and use, however, the shortcoming and gap in the literature exists in the scant researched area of user continuance intention towards technology-enabled services in developing regions. This study seeks to overcome this gap by modelling antecedents and testing for determinants of user continuance intention towards a technology-enabled service: M-pesa in Kenya.

This section has presented a contextual overview of the state of research on technology use in the developing world. The next section situates the study within the framework of ICT4D, as it seeks to identify and report on factors that foster utilization of technology for socio-economic development.

2.2 Levels in Africa's Development

Approximately 80% of the globes population are resident in developing regions (Spencer, 2011), which includes Africa. The majority of countries on the African continent are generally classed in the developing world segment, which is characterized by poor roads, technology infrastructure, building infrastructure, electrical infrastructure, poor governance, amongst others. These qualities are often present in resource-underutilized countries (Thapa & Saebo, 2011), and technology-enabled services cannot flourish within these boundaries (Teo, Ranganathan, & Dhaliwal 2006, p.395; United Nations, 2012, p.5). As such, these conditions have presented an obstacle for investors to provide technology-enabled services in the region and have hampered Africa's potential in competing with the rest of the world. However, the millennium turned a new leaf for Africa: where mobile phone proliferation is astounding and the continent now vaunts prevalent use of the device and the highest mobile telephony uptake globally (Hosman & Fife, 2012). In essence, Africa is the first continent to report greater numbers of cell phone use over landlines. This phenomenon has been stirred to the continents advantage, as it leads the globe in economic-enablement of mobile phone supported services (Shapsha, 2012). The proliferation of mobile phone use has impacted several industries on the continent, such as: finance, agriculture, health, and politics by fostering mobile phone enabled development projects (Chavula, 2013, p.5; Aker & Mbiti, 2010, p. 222). Consequently, mobile phones have altered the socio and economic position in developing regions like Africa by improving communication and service delivery channels (The Economist, 2008).

2.2.1 ICT4D

The proliferation and continued uptake of mobile phones within the developing world has demanded academic, socioeconomic, and political attention (Vincent & Cull, 2013). As such, the ICT4D field is becoming a profitable venture for researchers in the developing world. ICT4D is a research stream that focuses on RQ's and their answers as solutions to developing a society. This

research stream encompasses developing and implementing technology-enabled products and services to achieve target development goals in a developing country. The inception of ICT4D was driven by the internet and millennium development goals (Heeks, 2008). Some of these goals include: (i) eradicate poverty and hunger, (ii) attain universal primary education, (iii) ensure environmental sustainability, (iv) cultivate a global partnership for development (Thapa & Saebo, 2014). A critical discourse within ICT4D field is the emphasis of technology-enabled devices as tools for development. Although technology-enabled devices hold promises for the developing world, developing countries cannot use technology to leapfrog[13] stages of development (Kao, 2013, p.364). Rashid and Elder (2009), however, contend this view with optimism that there exist well-documented success stories of leapfrogging in a variety of areas. A renowned success story is M-pesa in Kenya, which is a mobile technology-enabled service, and studies on this type of technology, is classed within a sub-stream of ICT4D: mobile for development (M4D).

2.2.2 M4D

Mobile technology in this study refers to cellular phones that facilitate the performance of tasks. M4D are collective efforts to examine mobile technology in global development strategies, and is a research stream that is not yet established but is steadily growing (Donner, 2010). The rapid and continuous uptake of the mobile phone in several ICT4D ventures has instigated this creation of a separate stream of study, despite its infancy of 10 years (Donner, 2010). Mobile technology has been presented as the primary form of technology to bridge the digital divide (ITU, 2013), as it is a device used by both rural and urban residents, and the rich and poor. Thus, it provides a link to individuals, information sources, economic markets and public services (Aker & Mbiti, 2010). Erstwhile considered a device for the opulent and privilege, mobile phones are now necessities across the developed and developing world (Aker & Mbiti, 2010). Mobile phones are particularly embraced in the developing world because the region possesses less-developed wired infrastructure owing to high costs associated with its modernization and implementation; thus leapfrogging the traditional telephony and communication technology (Heijenk & Liu, 2005). Further, the unreliable power infrastructure of majority of the developing world is unfavourable to mass cable-based ICT adoption. Nonetheless, characteristics of the mobile phone such as:

[13] Leapfrogging refers to a manner in which developing countries may improve their technological capacity to attain level similar to the developed world (Kao, 2013).

mobility, accessibility, and battery life are a better fit for the general pursuits of residents in the developing world (Vincent & Cull, 2013).

The benefits of M4D can be classified as follows: (i) incremental: advancing the pace and efficiency of extant practices, (ii) transformational: introducing novelty, and (iii) production-based: sale of mobile and mobile-enabled services (Etzo & Collender, 2010). Amongst these benefits, this study fits with the transformational segment. An example of a transformational benefit is innovative economic services such as M-pesa. This mobile technology-enabled service has become vital and exceptional, buttressing the position that 'access to the mobile phone, once realized, becomes an integral component of daily living' (Porter, Hampshire, Abane, Munthali, Robson, Mashiri, & Tanle, Maponya, & Dube, 2012, p.158).

This section was an introduction to M4D, as the service of focus for this study is enabled by mobile technology. Next, the researcher briefly presents insights to the level of mobile subscriptions within the globe, as M-pesa service is based on this platform.

2.3 Mobile penetration in the globe

Mobile phones are ubiquitous and now estimated to hold high subscription levels globally; there is now an estimated 6.8 billion subscriptions[14] of the globes 7.1 billion population (International Telecommunications Union, 2014). This implies that the ratio of mobile subscriptions to humans is approaching par. However, the success of a technology is not a predestined outcome only of its existence, rather, value propositions are required to give each party incentive to access an offer (Pousttchi, Weizmann, & Turowski, 2003, p.414). An extant theory of informational added values supports this view, positing that every business model needs to prove its capability to generate a benefit for the customers that would pay for it (Kuhlen, 1996). Mobile technology such as cell phones offers core benefits like ubiquity and personalization amongst others (Kim, Chan, & Gupta, 2007). Ubiquity enables access to various mobile-enabled services at anytime and place, whilst personalization allows for multiple customizable services on mobile platforms. These two benefits are ample basis to entice individuals to use mobile technology. As such, the accessibility and growth of mobile technology creates novel opportunities for businesses and individuals (Kim,

[14] Mobile phone subscriptions are offerings to the public mobile vendor that provides access to the public switched telephone network (PSTN) using Cellular technology.

Kim, & Wachter, 2013). In a consumer vein, the GSMA (2014) opines that drivers to mobile subscription growth will emanate from the developing regions, and are projected to provide about 880 million subscribers within a seven year period, whereas, only 56 million will stem from developed regions.

As is, developed regions now have an average unique subscriber penetration level of 79%; a figure considered the demographic ceiling- where subscription growth is likely to stall (GSMA, 2014). Conversely, developing regions stand at 41%, as only 4 of 10 individuals in this region have mobile phone subscription (GSMA, 2014). On a continental level, unique subscriber penetration rates vary notably across regions. Europe ranks the highest penetrators, then North America, and then Sub-Saharan Africa ranks the least, although it is credited with increasing subscription growth above any region in recent times (GSMA, 2014). Collectively, given acknowledgements to developing regions for the increasing mobile subscription rates, with an emphasis on sub-Saharan Africa- where Kenya resides, this study notes the identified potential of the mobile phone within the region that awaits realization, and seeks to support understanding of use with extant mobile technology-enabled products and services in this part of the developing world.

This section has briefly outlined the present state of mobile subscriptions globally, and highlighted a need to focus on developing regions, and further Africa. The next section briefly discusses the state of mobile phone coverage in sub-Saharan Africa.

2.3.1 Mobile Phone Coverage in Sub-Saharan Africa

The mobile infrastructure in Sub-Saharan Africa is consistently evolving across key industries as individuals, business, and government are constantly embracing mobile technology to facilitate services (Ericsson, 2014). Erstwhile, in 1999, a scant 10% of the population had coverage, and this was predominantly in South Africa and Senegal (Rotberg & Aker, 2013). In addition, Rotberg & Aker citing wireless intelligence, 2008) report that, in monitoring growth rates, individual owners of mobile phones in this region rose from 16 million to 376 million between year 2000 and 2008. As of 2012, mobile ownership in the region stood at over 500 million; a significant

population[15] of the continent (Rotberg & Aker, 2013). Further, Ericsson (2014) asserts that by the close of 2014, there would be over 635 million subscriptions in Sub-Saharan Africa. Additionally, Ericsson (2014) reports predictions of subscription rates to reach 930 million by the end of 2019. Collectively, it can be inferred from this statistics that the mobile phone is rapidly becoming a tool accessible to all in a developing region- Africa, and consequently technology vendors continue to seek ways to develop services and products via this medium to meet various needs of the increasing user base of this technology.

This section has provided a background to the proliferation of mobile phones within the globe and Africa. An overview of mobile diffusion within the continent was vital because M-pesa is enabled by mobile technology. Next, the researcher provides a synopsis of the first mobile-enabled finance service targeted at the unbanked.

2.3.2 Chronicles of mobile-finance initiatives for the Unbanked in Africa

The first mobile payment initiative in Africa was launched by WIZZIT Payments (Pty) Ltd, in South Africa, in 2004. Wizzit is a division of the South African Bank of Athens, however; it is owned and operated by a team of independent entrepreneurs (Porteous, 2006). This vendor provides simple banking services for the unbanked and underbanked[16]. At the time of Wizzit's inception, half of South Africa's population were unbanked; due to high poverty levels and reluctance by banks to serve a poor customer base (Nobel, 2011). Yet, the founders of Wizzit deemed it dignified and feasible to offer banking to the poor through a mobile banking platform that could be operated on a basic cell phone. Its services are mobile-enabled for accessing bank accounts and executing transactions, and include a Maestro debit card that is issued to all customers after registration. Wizzit is a branchless banking service, implying that its services do not require users to visit banking outlets. Although Wizzit does not operate any branches of its own, it partners with the Absa Group and the South African Post Office which serve as banking agents and permits Wizzit's customers to deposit funds at any Absa or Post Office branch. Equally, Wizzit does not operate any automated teller machine (ATM) network but its users can make deposits and withdrawals with their debit card at any point of sale (POS) or ATM accepting

[15] Africa has a population of 1.033 billion (world population review, 2015).
[16] Unbanked refers to individuals who do not have access to banking services, while underbanked refers to person whom have inadequate access to banking services.

Maestro cards. The user base of Wizzit between its inception and 2008, stood at 250,000 in South Africa. Nonetheless, it has rolled out pilot projects in Romania, and intends to expand into other African countries such as: Kenya, Botswana, Namibia, Zambia, and Malawi (Lapper, 2009), and figures of its present user-based is unavailable. Mindful of this backdrop, the uptake of Wizzit (250,000 users within four years) is absolutely incomparable to that of M-pesa (8.6 million with two years), and as of 2009, Wizzit was not yet profitable (Nobel, 2011). There are speculations on causes of Wizzit's failure but scant empirical evidence exists to support the claims. The failure of Wizzit highlights the need to understand the real needs of customers and not vendor perception. In light of this study, M-pesa has thus far attained an astounding initial and rolling uptake; however, it is the first success story of a financial service proliferation amongst the masses in a developing country. To uphold this pace, and alleviate the possibility of a stall or decline in use, it of utmost importance to investigate drivers that sustain its use, which would aid circumvent an emphemeral success story.

Next, the researcher provides an overview of Kenya-the geographical focus of the study, and subsequently, discusses the financial sector profile of the country, and then provides background to the inception of M-pesa.

2.4 Overview of Kenya

Kenya is officially referred to as the Republic of Kenya and is situated within the eastern part of Africa. The country borders the Indian Ocean between Somalia and Tanzania. The capital city is called Nairobi, and it is a regional commercial hub. Kenya holds the most affluent economy in Southeast and Central Africa (International Monetary Fund, 2011). Agriculture is a key employer in Kenya; the country customarily exports tea and coffee. Kenya has an estimated population of 45.1 million people (CIA Fact book, 2014), and Nairobi is the most populous city in the country (Ngo, Gatari, Yan, Chillrud, Bouhamam, & Kinney, 2015). To give a summarized view of Kenya: facts on its geography, people and culture, economy, and telecommunications are presented in fig 2.1 and table 2.1 below. The information presented in the aforesaid table provides the reader with ample information required to understand Kenya within the study's context.

Fig 2.1 Kenya's situation on the Map of Africa

Table 2.1 Kenya in a Nutshell

Geography	**Location:**	East Africa, bordering the Indian Ocean, between Somalia and Tanzania
	Area:	Total: 580,367 sq km Land:569,140sq km Water: 11, 227 sq km
People and Society	**Languages:**	English (Official), Kiswahili (official), and other indigenous languages
	Population:	45,010,056
	Age Structure:	0-14 years: 42.1% (male 9,494,983/ female 9,435, 795)
		15-24 years: 18.7% (male 4,197,382/female 4,202,399)
		25-54 years: 32.8% (male 7,458,665/female 7,302,534)
		55-64 years: 3.7% (male 751,296/female 910,523)
		65 and over: 2.7% (male 548,431/female 708,048)
	Urbanization:	Urban population:24% of total population

		Rate of Urbanization: 4.36% annual rate of change	
		Major urban area population: Nairobi (Capital) 3.363 million; Mombasa 972,000	
	Education Expenditure: 6.7% of GDP Literacy (age 15 and over can read and write):	Total population:87.4% Male:90.6% Female:84.2%	
Economy	**Currency:**		Kenyan Shillings (KES)
	GDP (Purchasing Power Parity):		$79.9 billion
	Agriculture Products:		Coffee, tea, wheat, corn, fruit, vegetables, beef, fish, pork, poultry eggs, and sugarcane.
	Labour Force:		19.67 million
			Labour force in Agriculture sector: 75%
			Labour force in industry and services: 25%
	Unemployment Rate:		40%
	Population below poverty line:		43.4%
Telecommunications	**Telephone Lines:**		251,600 (2012 estimates)
	Mobile Cellular:		30.732 million
	Internet Hosts:		71,018
	Internet Users:		3.996 million

Source: CIA FACTBOOK, 2014.

Fig 2.1 and table 2.1 have respectively presented Kenya's location on the map and an overview of the country's geography, people, society, economy, and telecommunications state. This information should provide the reader with fundamental knowledge of the country. Next, the researcher presents a discussion on the financial sector of Kenya as it is M-pesa's operational sector.

2.4.1 Kenya's Financial Sector Profile within Africa

Within the past decade, there have been broad economic and financial sector reforms in Sub-Saharan Africa; however, several African countries still face austere financial development gaps compared to the developed economies and peer-developing countries (Allen, Carletti, Cull, Qian, Senbet, & Valenzuela, 2012). Lack of access by majority of a population to finance is a key impediment to the financial development process, as otherwise would promote economic growth at a broad level. Contemporary research account that in Sub-Saharan Africa over 80 percent of the adult population required accounts in the early 2000s; a figure over half of the population (Chaia,

Alberto, Goland, Gonzalez, Morduch, Schiff, 2013; Honohan, 2008). To understand this circumstance, Demirguc-Kunt and Klapper (2012) explain that in Sub-Saharan Africa, the most commonly mentioned cause for being unbanked is lack of enough money to use one.

The afore-noted lack of access to cash by low-income individuals necessitated initiations of the financial sector deepening program (FSD[17]) in Kenya. The FSD programme was launched in early 2005 to foster the growth of financial markets in Kenya; a goal to fuel wealth creation and alleviate poverty. As of 2006, only 19% of the Kenyan population possessed bank accounts, 8% used SACCO's[18] and micro-finance institutions[19], 35% used informal and ASCA's[20] and ROSCA's[21], and 38% were unbanked (GSMA, 2013b). In light of these percentages, the majority of Kenyans lacked access to formal established institutions that could provide them with access to a pool of capital and finance in general. This circumstance drove the need to create a financial service that could cater to the majority of the population.

2.4.2 Mobile Services in Kenya

Kenya is credited with uncommonly adopting and using mobile technology across the globe (Jack & Suri, 2010). As of 2002, merely 15,000 persons had mobile phones in the country; yet by 2009, mobile subscription rates stood at 14.5 million (CCK, 2009). Increasing, in 2010, about 20 million subscribers were reported in Kenya (CCK, 2010), and this figure amplified to 29 million subscribers within two years amongst a population of about 41 million (CCK, 2012). These mobile subscription levels have enabled vendors the opportunity to offer services on mobile technology platforms. Presently, four telecommunication vendors (i.e., Safaricom, Airtel, Yu Mobile and Orange) operate in Kenya. Amongst these vendors, Safaricom holds the largest market share of 78% (GSMA, 2012), whereas the remains (22%) is shared by the others (Orange, Airtel, and Yu). These vendors competition to attract and retain customers have favoured consumers' in Kenya as prices of telecom services reduced and infrastructure improved (Morawzcynski, 2011). Illustrating this, in 2009, the monthly average revenue per user (ARPU)

[17] http://www.fsdkenya.org/
[18] SACCO means Savings and Credit Cooperative Organization, and it is a non-profit, member-owned financial cooperatives funded largely by voluntary member deposits.
[19] Micro-finance institutions are associations typically funded by external loans, grants and/or investors.
[20] Accumulating Savings and Credit Associations (ASCA) refers to fund groups where member make contributions for lending loans which are paid back with interest.
[21] Rotating Savings and Credit Association (ROSCA) refers to a group of individuals who contribute for a defined period, to save and borrow collectively. It is also considered a form of combined peer-to-peer banking and peer-to-peer lending.

declined from Ksh 389 to Ksh 384, owing to cheaper calling rates (CCK, 2012). Consequently, telecom vendors in Kenya persistently seek ways to deliver services outside their core operations to complement their investment returns. Currently, a complementary beneficial venture of telecom vendors in Kenya is mobile money. M-pesa was the first MMS introduced to the Kenyan market in 2007 by telecom vendor- Safaricom, and successively replicated by other market entrants. Alongside M-pesa, three other vendors provide MMS: Airtel captures 5.5 million subscribers (18% market share), Yu Mobile with 2.7 million subscribers (9% market share) (Wachira, 2014; Vikas, 2014), and Orange serving 2.2 million subscribers (7% market share) (Okutoyi, 2014). As such, mobile money is consistently embraced in enabling several transactions such as airtime purchase, cash transfer, and payment of bills, etc. Ex-post M-pesa's launch, the total sum of money transacted via 'M-Pesa' was US $ 3.7 billion, close to 10% of Kenya's annual gross domestic product (GDP) (Safaricom, 2009), and this figure has steadily risen eventually. Contemporary statistics show that within 2011-2012, approximately Ksh 672.3 billion (US$ 8 billion) was transacted by MMS in the country (CCK, 2012). This amount represents 24% of Kenya's GDP (CCK, 2012). From a global outlook, M-pesa independently handles more transactions domestically than *western union* does internationally (Kendall, Machoka, Veniard. & Maurer, 2012; International Monetary Fund, 2011, p.50). Finally, M-pesa's proliferation spans a substantial number of the Kenyan population, with 17 million active users in 2012 (Demirguc-Kunt & Klapper, 2012).

2.4.3 The Inception of M-pesa service

The initial offering of M-pesa was P2P, which enabled transactions between individuals with mobile phones. Ex-ante of M-pesa's inception, informal services of money transfer was offered by individuals and non-financial licensed companies (e.g., friends, posts, and public transport companies) (Mbiti & Weil, 2011). By virtue of pressing demand for financial inclusion, only 22% of the adult population in Kenya operated bank accounts (Finscope, 2011). Transport companies offered money and posts, where recipients could collect their cash at a selected terminal. However, these unlicensed mediums were risky; remittances were not certain to reach the recipient. Hence, the introduction of M-pesa afforded Kenyans a financial service that all with mobile phones could use. Aforementioned, Kenya has 29 million mobile phone owners out of a population of about 41 million (CCK, 2012). Ex-post 2007, M-pesa captivated a substantial part of the informal financial service market- 38.13% by 2008 (Consultative Group to Assit the

Poorest, 2009). A notable decline was also apparent in former money transfers medium, such as: deliveries using public buses (29% in 2006 to only 5% in 2009). This switch in domestic transfer mechanisms is confirmation that M-pesa is now a preferred medium of transacting. As such, M-pesa persistently seeks to expand its offerings, as its services have developed to include: sending and receiving money, saving, purchase of airtime, payment of utility bills and salaries (Jack & Suri, 2010). More recently, M-pesa has expanded to include banking services such as interest based accounts, loans, and insurance (World Bank, 2011, p.55).

2.4.4 The Need to Examine M-pesa Within the Global Mobile Eco-system

Mobile is a pulsating and sprouting industry that is positioning the mobile phone as an integral part of the social lives of an emerging group of the world's population. As such, mobile service providers are collaborating with various industries to deliver innovative service to users (GSMA, 2013a). Credence in the prospective of mobile phones to bridge the banking needs of underprivileged persons has been fostered by the proliferation of networks into earlier unserved areas and vicinities of developing countries within the past decade (Duncombe, 2012). The value of the mobile phone is evident in developing nations within sub-Saharan Africa and notably Kenya, where fixed-line groundwork was mostly infirm and immature. As mobile phones are progressively gaining a foot hold in the lives of the underprivileged, a plausible proposition is their prospective to emerge as an economic delivery means for financial data, administration, and proceedings (Porteous, 2006). Consequently, mobile phones aid the expedition of novel service offerings across electronic payment services. Duncombe & Boateng (2009) submit that the preponderance of the underprivileged require, and are continuously demanding an expansive range of micro-financial services that the mobile phone could enable. These are considered economical solutions to fortify customary savings, aid spendings, facilitate small cash transfers and offer micro-finance. Given the mobiles phones increasing entrenchment in our daily lives, it becomes of equal importance to understand human behaviour towards use of mobile technology-enabled services. An understanding of this phenomenon could foster incremental use of this technology across a wider range of services.

Next, the researcher discusses consumer behaviour towards technology-enabled services.

2.5 Consumer Behaviour and Technology

Consumer use of a technology-enabled service is the visible part of a more complex decision making process created by the consumer for each use decision made. The complexity of the decision making process necessitated the sub-discipline of consumer behaviour. The study of consumer behaviour examines persons, groups, or businesses and the course of actions they use to select, purchase, and dispose of products, services, knowledge, or information to suit needs and the impacts that these processes have on the consumer and society (Kuester, 2012). Consumer behaviour is an integrated science that encapsulates parts of economics, marketing, psychology and sociology (Huang, 2009). It is also the basis for any marketing focused activities (Swarbrooke & Horner, 1999), which encompasses user continuance intention. Therefore it examines consumers and their psychological and sociological features which influence their buying or use behaviour. A perceptive of consumers enables businesses advance their marketing strategies by understanding consumers' feelings, reasons, and behaviour when faced with alternatives (e.g., brands, products, and vendors). Further, consumer behaviour is influenced by several factors which cut across attitudes, beliefs, intentions, and social factors. Thus a vendor's ability to ensure use and increased consumption of his or her products and services is reliant on the depth of his or her knowledge in positioning consumer appealing products and services (Bhattacherjee, 2001a). To understand the consumer decision-making process at a general level, several models have been developed (e.g., Engel, Blackwell, and Miniard, 1986; Kotler, Armstrong, & Wong, & Saunders, 2008; Belch, Belch, Kerr, & Powell, 2012). A common theme across these studies is a five-stage consumer buying decision process: Problem or need recognition, information search, evaluation of alternatives to meet the need, purchase decision and post-purchase behaviour. However, several criticisms exist on these traditional consumer decision-making models. A core objection against the models is that consumers do not always follow a lengthy, dynamic, cognitive loaded, rational, and goal oriented decision-making behaviour towards purchasing a product or service (Lofman, 1991, p.729). Explicating this, Firat (1985, p.5) notes that traditional models were developed within certain contexts, time frames, and social circumstances. As such, Firat (1985) cautions that when the same models are applied in new contexts and towards new products, they become unnatural and cause inequitys. To counteract such an occurence, it is important that a model be more representative of present real life circumstances with less or tailored emphasis on preconceived assumptions of events during the decision making process (Erasmus, Boshoff, Rousseau, 2001). In sum, while this study does not employ the five stage model, it discusses it as

a blueprint towards developing a contemporary model that is likely to predict user continuance intention towards M-pesa. The stages of the decision making process are discussed next.

2.5.1 Consumer Decision-Making Process

Modelling of consumer decision-making process allows for vendors to describe and predict consumer behaviour, and consequently provides an empirical source for marketing decisions. The conventional model for analysing buyer decision processes is a linear stage model of five key steps, as outlined in Fig. 2.1. The common drive is onward through the stages. The consumer advances firstly from a state of sensed deficiency (problem recognition) to seek information on potential solutions (information search). The information collected, internally (e.g., prior knowledge, perception, personality, emotions, attitude, etc.,) or externally (e.g., culture, family, reference groups, conversations, sales promotions) inputs to the next stage — the evaluation of alternatives (Hawkins, Best, & Coney, 2001). This stage involves a comparison of purchasing evaluation criteria. The Purchase stage entails the act of the acquisition. Last, post-purchase behaviour is concerned with the extent of satisfaction or dissatisfaction with the product or service, which is a key concern of vendors, as it provides information for future products and services. This model is instructive in enabling some of the complexities of the external environment and internal information processing to be captured. Nontheless, a recap cautionary note is that the linear nature of the model has been criticized as the elements of the buyer decision-making process does not always occur in sequential order (Philips & Bradshaw, 1993). As such, the core criticism of this approach is its mechanistic flow that may be inconsistent across various decision-making contexts, as other factors such as: consumer variables could interplay (Bray, 2008). This section has provided an overview of a blue-print of the consumer decision making process. Next, each stage of the process is discussed from an M-pesa use outlook.

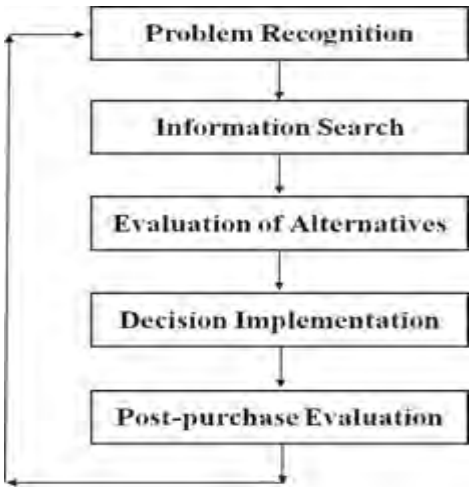

Fig 2.2 Consumer Decision-Making Process

Source: Belch et al (2012).

2.5.1.1 Problem or Need Recognition

From a technology use outlook, the need recognition is the initial and most vital step in the use decision process. Without a need, there is no use of the technology. The need or problem recognition occurs in the face of a lag between the consumer's actual state and a desired one (Belch et al. 2012). In Kenya, individuals were faced with a need for a reliable financial transaction service, as only 19% of the population operated formal accounts (GSMA, 2013b). This circumstance placed the majority of the population in an undesired state with hope for a resolution; instilling a need for a reliable money remittance channel.

2.5.1.2 Information Search

Subsequent to identification of the need, the consumer seeks information about possible solutions to the problem (Kotler et al. 2008). He or she will seek more or less information depending on the complexity of the choices to be made. Consumers who engage in information search will first utilize self-knowledge before searching for other sources of information (Hawkins et al. 2001). Where the alternatives are satisfactory, the process of information search can be closed. Otherwise, the consumer will engage in external information search (Pizam & Mansfeld, 2000). In searching for information, multiple sources are available to the consumer, and could be classified as internal and external (Kotler, 2000). Internal refers to extant information in the consumer's mind, which may have been acquired from past experiences (Hawkins et al. 2001). For external information, Kotler et al. (2008) posit four categories of external sources which

include: personal (e.g., friends and family), business (e.g., promotion, sales representatives), public (e.g., press), and pragmatic (trialability).

In Kenya, M-pesa was a novel service and had no predecessors (Hughes & Lonie, 2007, p.63), thus the only source of information for consumers would have been public and commercial sources. The information conveyed through these channels seems to have sufficed as the uptake of the M-pesa service has been phenomenal.

2.5.1.3 Evaluation of Alternatives to Meet the Need

Once satisfied with the information gathered, the consumer proceeds to evaluate alternatives with a goal to select the one that best caters for his or her needs (Belch et al. 2012). Most products and services consist of layers and attributes, and necessitate evaluation at the level of the attributes. For example, there are objective characteristics (e.g., features and functionality of the product or service) and subjective (perception and perceived value of the brand by the consumer or its reputation). To examine the characteristics of a product or service, several scholars have empirically shown that consumer perception towards a product or service influences purchase or use behaviour (e.g., Chen, 2008; Gilbert & Wong, 2002; Huang, 2009; Zeithaml et al. 1996). In this vein, marketers developed models to measure consumer perception towards a product or service. A popular model in the extant literature that was posited in the 80's was SERVQUAL (Parasuraman, Zeitmal and Berry, 1985). This model assigns product attributes to one of its taxonomies, namely: reliability, assurance, tangibles, empathy and responsiveness. Following its conception, the SERVQUAL model has been modified, extended and adapted to various industries (Pizam & Mansfeld, 2000). On this note, Kozak and Decrop (2009) label this approach of characteristics examination as piecemeal process which is in contrast to the categorical process, where the product is seen from a holistic outlook. Despite this, the evaluation stage is prone to exclusion in some cases. Kotler et al. (2008) explains that the evaluation of alternatives stage may be skipped by consumers with a high drive or who are directly exposed to product and convinced of its value. In the case of M-pesa, the evaluation of alternatives does not apply as it was the premiere service of its kind (Hughes & Lonie, p.63), thus consumers would likely have based their use of the service on information gathered or vendor claims.

2.5.1.4 Purchase Decision

Following an evaluation of the different solutions (product or services) available to meet the need, the consumer should be capable of selecting the most appropriate option (Belch et al. 2012). The consumer's decision will be based on the information and the selection made in the preceding step, in light of perceived value, product features, and important capabilities. Afterwards, he or she proceeds to the actual purchase (Kotler et al. 2008). Although this is the penultimate stage where the purchase or use of a product or service takes places, Kotler (2009) cautions that the purchase decision may be interjected by two factors. These are negative feedback from other consumers and the level of reception to the feedback. This impediment flows from the information search and evaluation of alternatives stages.

In the case of M-pesa, a decision to use would have been based on vendor claims of the service features since it was the first of its kind (Hughes & Lonie, 2007, p.63); there were no prior alternatives.

2.5.1.5 Post Purchase Decision

The post-purchase stage in this model is the fusion point with this study. Belch et al. (2012) describe this stage as the evaluation of expectations after use of the product or service. The result of the evaluation would determine the consumer's satisfaction level: either satisfied (has met or exceeded expectations) or dissatisfied (below expectations) (Kotler, 2000). User continuance intention is a post-adoption phenomenon and is also largely influenced by satisfaction levels (Bhattacherjee, 2001a). A consumer's satisfaction level with a product or service will impact the decision process for similar purchases of products or use of services from the same vendor in the future because there will be a knock on effect at the information search and evaluation stages (Mayland, 2000).

Specifically, post-purchase stage is influenced by the information search stage, in that; it is common practice for consumers to reveal their positive or negative incidents with mates and family. In the same vein, satisfaction with a product or service influences evaluation of alternatives as discontent users are unlikely to spread positive feedback about the product or service; a product or service with a poor reputation is unlikely to be selected amongst alternatives. As such, vendors must be cautious to create positive post-purchase communication. This enables a dispersion of positive feedback around the reputation of their products or services.

In this study, target participants (users of M-pesa) would possess first-hand experience with the service and can now pass judgement based on use. As identified in this generic model, the extent of user satisfaction or dissatisfaction is a key determinant in the post-acceptance phase of purchase or use of a product or service. To examine user continuance intention towards M-pesa, a similar process based approach (model based approach) is applied and factors from the literature will be identified and reviewed for aptness in determining user continuance intention.

2.6 A Model-Based Approach to Examining Consumer Behaviour towards M-pesa

The previous section discussed consumer behaviour towards purchase or use of a product or service through the lens of a decision making process. A process-based approach presents consumers as "rational"; and the consumer decision making process as a flow of "rationality. This implies consumer actions are based on cause and effect relationship. Whilst consumer behaviour could be examined without using decision-making process models (by only experimental approaches), the decision making process is crucial in consumer behaviour studies (Bhattacherjee, 2001a; Markus & De Guinea, 2008; Bhattercherjee & Lin, 2014). This is because models are a suitable way to explain process driven outcomes (Livette, 2006), and visually depict the associations and cause and effects relationships that exist around a phenomenon. Further, models facilitate the understanding of variances in consumer decision-making processes (Engel, Blackwell and Miniard, 1995, p.143; Erasmus, Boshoff and Rousseau, 2001; Livette, 2006), and simplify reality (Caine and Robson, 1993); making them instructive in examining complex phenomena.

User continuance intention- consumer behaviour is a complex subject because a plethora of factors could determine this phenomenon. As such, the researcher adopts a model based approach with a goal to discover *some* of the factors that may determine user continuance with the M-pesa service. Modelling behaviour provides theoretical based factor discovery insight to a query. Additionally, building theoretical knowledge and models is important for businesses, by providing them with knowledge to better understand their consumer, segment the market, and ultimately increase profitability (Rickwood and White, 2009).

2.7 Conclusion

This chapter has presented the research issues of this study. It began with a contextual overview of the study's research issues, which highlighted a need to investigate user continuance intention with technology in the developing world. Next, it discussed development levels in Africa from a technology infrastructure outlook, and then situated the study within the framework of an ICT4D study. It then outlined the mission of ICT4D and drilled-down to situate the study within a M4D class, which is a sub-discipline of ICT4D. Subsequently, mobile penetration levels within the globe were discussed, and penetration levels with developing regions were highlighted. Then, a background to Kenya was presented, as it is the geographical focus of this study. Afterwards, a backdrop to Kenya's financial service sector was presented, mobile services in Kenya, and the background to the inception of M-pesa. Thereafter, an argument for the need to examine M-pesa within the global mobile eco-system was presented. Last, consumer behaviour towards technology was discussed with arguments for and against employment of a model based approach for its examination.

The next chapter presents discussion around theoretical underpinnings for the model development of the study.

3. THEORETICAL DEVELOPMENT

"The essence of science is that it is always willing to abandon a given idea for a better one"~ ***H.L. Mencken***

The previous chapter discussed research issues around user continuance with technology in the developing world.

This chapter develops a theoretical model of user continuance intention towards MMS. In developing the study's conceptual model, guidelines for model development are identified and applied. Next, context related models and theories on IS user continuance are reviewed and parochial approaches are adopted to filter through the plethora of extant studies, to obtain context related literature and select appropriate constructs. Thereafter, hypotheses are developed for test.

3.1 Guidelines adopted for Theoretical Model Construction

The task of theory building is a challenging one and often tricky to execute properly. Possibly because the abstraction derived from something, or a reaction to it, is not the thing in question. Reviews of processes towards constructing and developing theories occur in a range of disciplines. This issue of theory development is of utmost importance as its debates are usually published in leading scholarly journals across disciplines (Bacharach, 1989). Essentially, majority of the established social science disciplines (e.g., management, organizational science, philosophy) have an extensive history enquiring into development of theory (Van De Ven, 1989; Whetten, 1989; Kaplan, 1998). A researcher's aptitude to build a standard theoretical model is often believed to be an artistic talent (Weber, 2003). As such, scholars (Whetten, 1989; Weber, 2003; Gregor, 2006) caution that there are boundaries in theory development, which include three essential steps to ensure theoretical standards. These steps are outlined next.

3.1.1 Step 1 - Evolve the theorectical construction

Research models are composed of constructs, which are the objects of focus in the theory, and they must be properly specified. A properly defined construct helps provide clarity, as there are variations in constructs. For example, theoretical (nominal) or collective terms, observational (real) terms (Dubin, 1978). A yardstick proposed by Whetten (1989) to examine the degree to

which a theory consists of appropraiate constructs, poses these two test questions: (i) To assess comprehensiveness: are all the relevant constructs included? (ii) To assess parsimony: what factors may be excluded from the model without significantly affecting the explanatory power of the theory? A researcher's answers to the aforesaid questions will aid in building a parsimonious model with a significant predictive power.

3.1.2 Step 2- Articulate the relationships between and amongst the constructs

Following the identification and selection of constructs, the subsequent test is to explain the relationships between or amongst these constructs. This is because the relationships amongst constructs may be posited with varying degrees of precision. There are various types of relationships, such as; conditional[22], causal[23], associative[24], compositional[25], uni-directional[26], and bi-directional [27](Gregor, 2006). Thus, for every postulation, the relationships should be interpreted within context. To further exemplify this, a given theory could simply posit that its constructs are all associated. This means that the value of a construct will impact the significance of another construct. Another example could be functional relationships between constructs where the significance level of a construct could be a mediator, mitigator, or moderator of the importance of another construct.

3.1.3 Step 3- Articulate the scope of selected theory

According to Gregor (2006), a theory's scope is stipulated by the extent to which simplification of the statements of relationships and boundaries show the limits of generalizations. To unpack these limits, conditions of 'whom, when, and where' should restrict the propositions or hypotheses generated in accordance with step one and two (Weber, 2003). Spatial, contextual, and temporal factors of these natures set the boundaries for generalizations.

In addition to the three steps discussed above, the theoretical development could be further strengthened. Whetten (1989) proposed a fourth step, suggesting that a researcher should stipulate

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[22] a logical relation between propositions X and Y of the form `if X then Y'; if X is true then Y cannot be false.
[23] a relationship between a construct (X) and another (Y) in which X precedes and causes Y.
[24] a relationship between or amongst constructs that leads from one term to other terms that are related to or associated with it.
[25] a relationship between two constructs that is based on the aggregation relationship.
[26] a relationship where only one construct has a relationship that refers to the other.
[27] a relationship that has an inverse.

the basic cognitive, physiological, commercial, and societal actions that underpin the choice of constructs. This step answers the 'Why', which in turn gives credibility to the proposed conceptual solution. Similar to Whetten's (1989) proposal, Weber (2003) also suggests an additional step of considering the 'lawful event space' for boundary description of theory. This concept describes possible events that could occur outside the postulation of the theory, and may alter the values and relationships posited theoretically. Finally, in articulating the scope of theory, Gregor (2006) highlights the need to pay attention to the representation of theory because theoretical statements are composed of various means of representation, and may go unnoticed. In essence, theory may be symbolized in various forms such as: words, mathematical terms, tables, diagrams, symbolic logic, pictures, models, etc. Thus, a researcher's ability to deduce the symbolic use of theory in a given context is a valuable skill to possess.

Illustratively, graphical descriptions are recommended when presenting multifaceted theoretical constructs and associations. This helps to simplify the researcher's thoughts and to reduce vagueness of concept (Gregor, 2006). Whereas, formal models are instrumental in ensuring a clear-cut comprehension of the constituents, methods, and precincts of constructs and links stipulated theorectically. They could also aid in the assessment of theoretical validity and scope (Ter Hofstede & Van der Weide, 1992). In sum, theoretical model development is akin to building a system with several pieces that are related at some level, under the influence of some law of interaction.

3.2 Development of Conceptual Model

To develop the present study's research model, the guidelines discussed in the previous section are taken into account. First, the researcher conducted an extensive search of the extant literature to identify the most appropriate theories for investigating this study's focus- continuance intention. Second, the researcher perused the literature to identify theories that would inform the selection of possible antecedents of user continuance intention towards M-pesa (RQ 1). Third, the researcher reflects on the literature to inform the hypothesized relationships and offers explanations for the causal logic within the study's context. As such, three models and two theories were identified in constructing the research model. Next, the selection process of the models and theories are discussed, their application to the study, and the causal logic behind the hypothesized relationships.

3.2.1. Continuance Intention- Overview of the base model

Over the last decade, an initial and primary theoretical basis of IS continuance research was proposed by Anol Bhattacherjee (2001a) in an MISQ[28] publication. This publication is considered the cornerstone of continuance studies because it advances our understanding of user continuance intention in two ways. First, it presents a compelling case for an explicit distinction between user preliminary acceptance and durable use of a technology-enabled product or service. Second, it presents a baseline theoretical model for its proposal. A core tenet of continuance theory holds that a user's continuance with a technology is reliant on a cognisant or intended decision to operate in a given way (Bhattacherjee & Lin 2014). The aforesaid decisions are asserted to entail two inputs: (i) expected benefits from future use, such as the usefulness of the technology in completing a task, and (ii) aggregated judgements of the result of prior use, which is captured in the user satisfaction construct (Bhattacherjee, 2001a). Although Bhattacherjee's (2001a) model has served as a sound set off, research advances in this area makes it imperative to ponder other theoretical viewpoints for fostering enhanced rationalization of technology continuance. In accordance, Poole and Van de Ven (1989) aver that theoretical contests in a quest for explaining a given phenomenon can inspire the advancement of more encircling theories. Further concurring, Bhattacherjee & Lin (2014) argue that model evaluation and fusion has aided the advancement of our understanding of technology acceptance (e.g., Venkatesh, Morris, Davis, & Davis, 2003).

3.2.2 Towards Identification of Potential Antecedents and Determinants of Continuance Intention towards M-pesa

A germinating ground within the IS literature is post-adoption, and it is concerned with individuals use of technology ensuing initial adoption (De Guinea & Markus 2009). IS post-adoption has been a focus area for theoretical development, and is now referenced by several labels, which include: IT usage (Straub, Limayem, & Karahanna-Evaristo, 1995; Agarwal & Karahanna, 2000; Bhattacherjee & Premkumar, 2004; Kim & Malhotra, 2005; Burton-Jones and Gallivan, 2007), IS continuance (Bhattacherjee, 2001a; Cheung & Limayem, 2005; Kim et al, 2007; Limayem et al. 2007; Wu & Kuo, 2008; Larsen et al. 2009; Zhou, 2013), post-adoptive IT

[28] Management Information Systems Quarterly is the leading scholarly journal of the IS discipline.

usage (Jasperson et al. 2005), IS Reuse (Kettinger, Park, & Smith, 2009), IS Extended Usage and Exploratory Usage (Saeed & Helm, 2008), and Customer Retention (Vatanasombut, Igbaria, Stylianou, & Rodgers, 2008), amongst others. That said, the expedition for antecedents and determinants of IS use remains a salient venture in theory and practice. On this note, Bhattacherjee (2001a) writes that IT continuance is considered a chain of decisions influencing continued use of a technology. To characterize the decision making process asserted by Bhattacherjee (2001a), De Guinea and Markus (2009) explain that the process is twofold: First is logically based on views of usefulness and ease of use, expectations based on familiarity, and other beliefs (Bhattacherjee, 2001a; Venkatesh, Brown, Maruping, & Bala, 2008). Second involves emotional responses to use of technology, for instance, satisfaction or mental assimilation (Agarwal & Karahanna, 2000; Sun & Zhang, 2006). Simultaneously, advances in the IS literature has taken a commendable leap by drawing on psychology literature, to put forward that continuance with IT could be habitual. The argument here is that in the presence of habitual use, intention loses its guiding force on use. Habitual use of IT is posited as repetitive behavioural series involuntarily prompted by environmental cues, rather than resolute behaviour (De Guinea & Markus, 2009; Bhattacherjee & Lin, 2014). On habit, its influence has been received with mixed feelings, and its nomological path is still under debate. Some studies have reported that habit directly influences continued IT use (Kim & Malhotra, 2005), is mediated by continuance intention (Gefen, 2003), moderates the influence of continuance intention on continued use (Kim & Malthotra, 2005; Limayem et al. 2007). While habit is likely to be a salient construct in continuance of M-pesa, for this study, the researcher excludes it selection, until more resolute reports on its causal path are documented. However, on continuance studies as a body, a categorization scheme by Larsen et al. (2009) characterizes extant studies into three somewhat overlapping categories. First category refers to studies that have applied IS adoption as a criterion variable for predicting IS continuance (e.g., Lin, Wu, & Tsai, 2005; Roca, Chiu, & Martinez, 2006). Second category refers to studies of procedures explicating the development of time-variant continued use (e.g., Kim & Malhotra, 2005; Cheung & Limayem, 2005; Chiu, Chiu, & Chang, 2007). The third category refers to studies that combine the original IS continuance model with perceived harmonizing theoretical frameworks (e.g., Hsu & Chiu, 2004; Liao, Chen, & Yen, 2007; Chiu & Wang, 2008; Larsen, et al. 2009).

Mindful of this, the present study aligns with the third category because its objective is to model and test determinants of user continuance intention. As such, it seeks to adopt and test

complimentary factors from suitable models and theories in predicting user continuance towards M-pesa. Whilst this approach is commonly accepted in the IS community, leading authority- Anol Bhattacherjee and co-author Barfar (2011) have cautioned on the integration of inappropriate models (e.g., utilizing acceptance models- TAM & UTAUT in investigating continuance phenomenon), as identified in some extant studies (e.g., Chiu & Wang, 2008; Hong & Tam, 2006). An ill informed approach to the selection of factors for investigating continuance phenomenon stands to stir spurious correlations amongst unrelated factors and they propel a trajectory of misinformed views. In accordance, Bhattacherjee and Barfar (2011) opine that it is inapt to merge acceptance and continuance theories to predict continuance phenomenon, as these theories were posited to predict two divergent and time-variant separate behaviours (Bhattacherjee & Barfar, 2011).

Further, in their paper on current state and future direction of continuance research, Bhattacherjee and Barfar (2011) observe the variety of theories utilized in the investigation of IT continuance. These include TAM (Hong & Tam, 2006), UTAUT (Chiu & Wang, 2008), Theory of Habit (Limayem & Cheung, 2008), Fairness Theory (Chiu et al. 2007), Commitment-trust Theory (Vatanasombut et al. 2008), Innovation Diffusion Theory (Karahanna et al. 1999), amongst others. Following an outline of the aforementioned theories, Bhattacherjee and Barfar (2011) again stresses a distinction between IS adoption and continuance and argue that it is intuitive that factors that predict initial adoption may differ from continuance. To support this stance, the authors cite Karahanna et al's. (1999) findings that perceived ease of use, a factor from the TAM, and a significant motivator of IT acceptance, has an attenuating influence over time, and thus an insignificant effect in IT continuance. Also, Bhattacherjee (2001a) demonstrated that unique factors emerge in the post acceptance phase of IT usage, such as a user's confirmation and disconfirmation of expectations, and consequent satisfaction with the IT, which collectively influence IT continuance intention but are void on acceptance intention. Thus, theories and models designed to investigate IT acceptance (e.g TAM and UTAUT), may be inappropriate for explaining continuance.

That said, the next section presents the inception of Bhattacherjee's (2001a) model, and subsequently identifies extant studies on *continuance intention* that have been published in reputable IS journals, and studies that combine Bhattacherjee's (2001a) model with perceived complementary theoretical frameworks that are appropriate in a continuance era. The identified

studies will serve as a guide towards identifying potential antecedents of user continuance intention towards M-pesa.

3.2.3 Chronicles of the IS Post Acceptance Model (PAM)

The IS PAM is the first developed model in the IS literature explicitly for investigations into user continuance intention towards an IS. This model was developed by Bhattacherjee (2001a), and it draws on Davis (1989) technology acceptance model (TAM) and Oliver's (1980) expectation-confirmation theory (ECT). To explain the PAM, the researcher first backtracks to briefly explicate the source models (TAM and ECT), thereafter, the PAM is explained.

3.2.3.1 TAM

The TAM is an IS model that was developed by Davis (1989) to predict and explain how users come to accept and use a technology (see fig 3.1). It asserts that when an individual is presented with a technology, two key factors (perceived usefulness and perceived ease of use) and attitude will influence his or her behavioural intention to use the technology, which in turn would influence actual use of the technology. Perceived usefulness is a prospective user's subjective belief that the use of a given technology would increase his or her job performance (Davis, Bagozzi, & Warshaw, 1989, p.985). Whilst perceived ease of use is the extent to which the prospective user expects a given technology to be free of effort (Davis, et al.1989, p.985). Attitude is defined as an individual's optimistic or pessimistic feeling towards performing target behaviour (Davis et al. 1989, p.985)

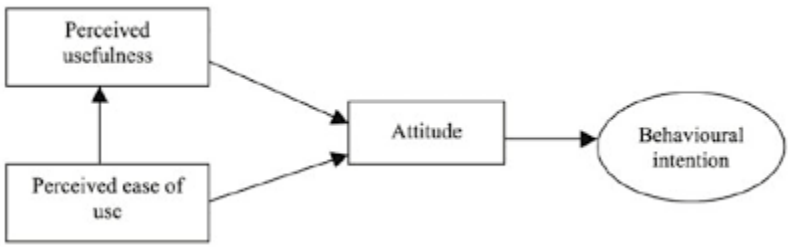


Fig 3.1 TAM (Davis, 1989)

3.2.3.2 ECT

Conversely, ECT is a theory from the consumer behaviour literature, and it is generally applied in studying consumer satisfaction and re-purchase behaviour, and service marketing phenomenon's

(Oliver, 1980; Anderson & Sullivan, 1993; Oliver, 1993). The predictive power of the theory has also been widely acclaimed in the investigation of product re-purchase and service continuance (Tse, Nicosia, & Wilton, 1990). To name a few: restaurant services (Swan & Trawick, 1981), automobile repurchases (Oliver, 1993), and business-to-business professional services (Patterson, Johnson, & Spreng, 1997).

The ECT comprises five constructs (see fig 3.2): expectations, performance, disconfirmation, satisfaction, and repurchase intention, but posits satisfaction as the core determinant of user intention to repurchase (Oliver, Balakrishnan, & Barry, 1994). This theory explains how satisfaction is created as users form preliminary expectations, utilize a product or service, and compare the product or service's performance against their preliminary expectations. As such, ECT holds that satisfaction is a user's emotional state or feeling about a given product or service subsequent to usage experience (Doll & Torkzadeh, 1988). Expectations are an individual's pre-usage beliefs on how the product or service will perform based on certain features (Olson & Dover, 1979; Sursala, Barua, & Whinston, 2003). Performance is an individual's post-usage conviction of the product or service execution against expectations in the use era (Cadotte, Woodruff, & Jenkins, 1987). Consequently, disconfirmation is a personal post-usage assessment that initiates perceptions of met expectations, better than expected, or below expectations (Oliver, 1980; Olson & Dover, 1979). Further, ECT posits that repurchase intentions is a multi-stage course and follows the outlined steps: (i) Prior to use, a consumer forms an initial pre-usage expectation towards a product or service, (ii) The consumer accepts and uses the product or service, (iii) The consumer assesses his or her perceived performance of the product or service against prior expectations, to determine the extent of confirmed expectation, (iv) The consumer forms a satisfaction found on their confirmation level, and the expectation on which the confirmation stands.

In sum, the ECT holds that first, prior to using a product or service, an individual forms a preliminary expectation based on vendor claims, advertisements, feedback from prior users, etc. Afterwards, the individual uses the product or service for an era and appraises the degree to which his or her real product or service experience corresponded to initial expectations. The fit between experience and expectation is termed confirmation in the ECT. Initial product or service expectation are averred to collectively determine a user's degree of satisfaction with the product or service. An evaluative affect- satisfaction, is a consequence of a user's transactional experience with the product or service which influences a user's intention to repurchase a given product or

service, such that satisfied users are repeat users while dissatisfied users resign use of the product or service.

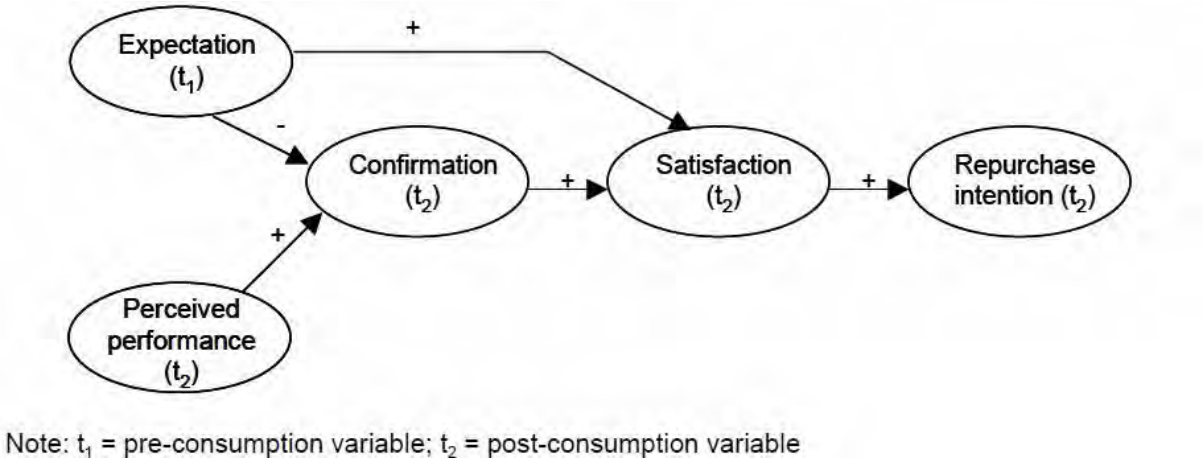


Fig 3.2 ECT (Oliver, 1980)

3.2.3.3 PAM

Aforementioned, the PAM is an adaptation from Oliver's (1980) ECT within the marketing literature. ECT was posited to describe the factors and effects of consumer satisfaction and dissatisfaction in the produce reprise and service maintenance environment. Post-inception of the ECT, a spectrum of views on the theory have been presented in the literature. Notably, Spreng, MacKenzie, & Olshavsky (1996) excluded the relationship between early beliefs and satisfaction, opining that the influence of expectation on satisfaction totally mediates confirmation; deducting credence to Oliver's (1980) application of expectation as a determinant of satisfaction. This position would serve as the baseline for the development of the PAM.

In operationalizing ECT to the context of technology-enabled products and services, Bhattacherjee (2001a) postulated a few additions and revisions to the initial model. His proposed modifactions were underpinned by extant knowledge of protensive IT acceptance and use, and other supporting theories, which include: self-perception theory and cognitive dissonance theory (CDT). Bhattacherjee (2001a) asserted that dimensions of preliminary beliefs as an influencer of disconfirmation and or satisfaction is suited merely for circumstances where beliefs are plausibly constant eventually. To exemplify this, (Bhattacherjee et al. 2008) write that a scenario of common consumer products and services, like automobiles and restaurant services is one where expectations are quite stable, but differs for technology-enabled products and services (e.g.,

programs and knowledge offerings), where user expectation is prone to alteration quite radically with time (Szajna & Scamell, 1993). For technology-enabled services, vendors customarily provide additional features in updated editions of their artefacts and services to improve user anticipations. Expectations vary amongst users of technology-enabled products and services (Bhattacherjee et al. 2008); some users initially form quixotic expectations, and when disconfirmed, are tempered to reasonable levels in their post-adoption era. Conversely, some begin with low expectations and are elevated in the post-adoption phase. In light of altering expectations, Bhattacherjee (2001a) argued that initial expectations, a validated predictor of IT acceptance has minor influence in forecasting durable continuance, and that post-adoption phase like continuance ought to examine post-adoption beliefs grounded in first-hand use instead of vendor or intermediary claims.

Second, based on longitudinal inquiry of technology acceptance and use, the PAM proposed perceived usefulness as the main post-adoption expectation associated with technology continuance (Bhattacherjee, 2001a). Utility concerns are basis for technology use, and are empirically reported to be unwavering predictors across temporal phases (Karahanna et al. 1999). Though complementary viewpoints such as *ease of use* may predict initial usage, studies (e.g., Karahanna et al. 1999) report that the cause of these beliefs attenuate eventually as users gain familiarity with the technology and are overridden by utility concerns.

Third, an unmediated affirmative link between disconfirmation and perceived usefulness is posited in the PAM. Broadening the CDT, Bhattacherjee (2001a) suggested that disconfirmation of expectation, based on its influence on satisfaction and intention will influence both impending behaviour and perceptions (i.e., post-acceptance expectation of usefulness). He further explains that because disconfirmation is an illustration of cognitive discord, in the face of dissension, users attempt to regulate their behaviour or perceptions to curtail the emotional effect of dissonance.

Last, Bhattacherjee (2001a) posited an affirmative association between perceived usefulness and satisfaction. He intuits that as most attitude focused theories (e.g., theory of reasoned action, theory of planned behaviour) hypothesize attitude to mediate psychical assents and intention. Where as satisfaction which is the main influence in continuance, could mediate the influence of perceived usefulness on continuance intention.

In retrospect to the above discussion, Bhattacherjee (2001a) develops the PAM which comprises four variables (three predictors and one criterion): perceived usefulness, confirmation,

satisfaction, and continuance intention. It posits that a user's intention to continue using a technology is dependent on the aforementioned factors: the user's degree of satisfaction with the technology; the degree of the user's confirmation of expectations; and post-adoption expectation captured as perceived usefulness. These factors are associated in the following ways. First, users form a preliminary expectation of a given technology before use. Second, the user accepts and uses the technology. Third, following a period of use, the user develops perception about the technology's performance (perceived usefulness). Fourth, the user compares the perceived performance against his or her initial expectation to establish the extent to which their expectation has been confirmed (confirmation). Fifth, the user forms an affect (satisfaction) based on his or her confirmation level, and the expectation on which that confirmation was based. Last, satisfied users develop a technology continuance intention, whereas dissatisfied users discontinue use of the technology.

Table 3.1 Conceptual definition of PAM constructs (Bhattacherjee, 2001a)

Construct	Operational Definition
IS continuance intention	A user's intention to continue using a technology
Satisfaction	A user's affect with (feelings about) prior technology use
Perceived usefulness	A user's perception of expected gains of using a technology
Confirmation	A user's perception of the correspondence between expectation of the technology use and its actual performance

The above logical process is presented because continuance with a technology often entails financial and non-financial costs on the users (Bhattacherjee, 2001a). Thus, rational users are likely to conform to an important decision train, identical to those in the ECT, preceding a decision to use. In sum, the PAM holds that: following a user's acceptance and initial use of a technology, he or she forms an opinion of confirmation or disconfirmation of their expectations. Where expectations are confirmed, a user forms opinions about the benefits (perceived usefulness) of the technology. Eventually, both confirmation and perceived usefulness will influence their satisfaction with the technology. Last, perceived usefulness and satisfaction will impact their desire to continue using the technology. A graphical depiction of the PAM is presented in fig 3.3.

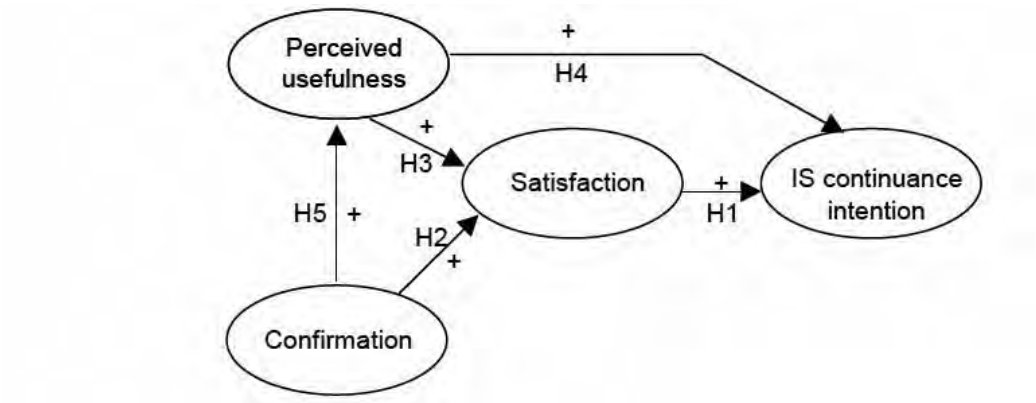


Fig 3.3 IS PAM (Bhattacherjee, 2001a)

3.2.4 Extending the PAM

The IS PAM serves as an excellent baseline for more investigation of the technology continuance experience because the model is: (i) theoretically underpinned (ii) maintained by an uprising empirical base in the marketing and IT use literature (iii) parsimonious, given its postulation with only three predictors, (iv) empirically testable within contexts where research trails instead of heralds (Bhattacherjee et al. 2008, p.19).

Following the publication of Bhattacherjee's (2001a) study in the IS discipline's leading journal-MISQ, several scholars have applied this model in varying contexts. To name a few, usage continuance in e-commerce (Hsu & Chiu, 2004; Lin et al. 2005; Al-maghrabi, Dennis, Halliday, & Binali, 2011), e-learning (Roca et al. 2006; Liao et al. 2009), mobile-internet services (Thong, Hong, & Tam, 2006; Zhou, 2013), e-government (Bhattacherjee et al., 2008), high-maintenance systems (Assadi & Hassanein, 2010) amongst others, and reported improved predictive powers. However, to further improve the predictive power of a model that assess human behaviour, additional theoretical perspectives and empirical tests are imperative to advance the robustness and predictive capacity across a broader range of realms (Bhattacherjee et al. 2008). In this vein of theory development, the researcher proposes potential complementary construct to the PAM.

3.2.4.1 Boundaries

To set the boundary for the selection of potential antecedents of user continuance intention towards M-pesa, the researcher takes a parochial approach, in that, the study aligns with the third category of Larsen et al's. (2009) taxonomy of continuance studies; combines the original IS

PAM with perceived complementary theoretical frameworks. To limit the complexity of identifying antecedents of continuance within a plethora of post-adoption studies that have integrated the IS PAM with complementary constructs, the researcher constrains the review for constructs to publications within prominent IS journals with the dependent variable labelled *continuance intention* or models that include *continuance intention*. Further, outside the framework of the IS PAM, only identified constructs that are relevant to a mobile technology context will be discussed as candidates for antecedents of user continuance intention towards M-pesa. A cautionary note is that the researcher does not aim to provide a complete model of the determinants of continuance intention; rather, he contributes to the continuance stream by integrating salient factors that will likely predict user continuance towards M-pesa.

3.2.4.2.1 Literature boundary

In search of appropriate literature for review, key word- 'continuance intention' was used. Publications in several journals were returned. However, to ensure theoretical rigour and scholarship, the researcher selects articles to be reviewed based on novelty of theory and model integration and journal reputation. Further, the researcher selects articles through the cautionary lens of leading authority in technology continuance studies- Bhattacherjee and co-author Barfar (2011); *refrain from applying acceptance models to explain a continuance phenomenon because these are two distinct and time-variant separate behaviours*. As such, the identified and reviewed articles which conform to this afore-noted train of thought are presented in table 3.2 below. In total, 15 articles which contained the 'continuance' factor were identified and reviewed. The distribution of these articles in reputable IS journals, the authors, theoretical lens, sample, methodology, findings, and limitations is presented in table 3.2 below.

Table 3.2 Publications of user continuance intention models in reputable IS journals

Author & Year of Publication	Title of Article	Theoretical lens & specific additional construct(s) to explain continuance	Journal	Sample	Methodology	Findings	Key Limitation
1. Bhattacherjee, 2001b.	An empirical analysis of the antecedents of electronic commerce service continuance	ECT, TAM, and Agency Theory. Confirmation, Satisfaction, Perceived Usefulness, Loyalty Incentives, Continuance Intention	Decision support systems	On-line brokerage users	Quantitative	Satisfaction, perceived usefulness, and confirmation are significant predictors of continuance intention	Results are constrained to the few selected factors within ECT, TAM and Agency Theory
2. Bhattacherjee, 2001a	Understanding information systems continuance: an expectation-confirmation model	TAM and ECT Perceived Usefulness, Confirmation, Satisfaction, and Continuance Intention	MISQ	On-line banking users	Quantitative	Confirmation influences perceived usefulness and satisfaction which in turn influences continuance intention	Low response rate of 122.
3. Bhattacherjee & Prekumar (2004)	Understanding Changes in Belief and Attitude Toward Information Technology Usage: A Theoretical Model and Longitudinal Test	TAM and ECT Disconfirmation, Satisfaction, beliefs, attitude, intention	MISQ	Students	Quantitative and Qualitative	Perceptions of usefulness and attitudes are not constant but vary over period of technology use	Use of only student sample
4. Lin et al. (2005)	Integrating perceived playfulness into expectation-confirmation model for web portal context	ECT Expectation, perceived Performance, Confirmation, Satisfaction, and Repurchase Intention	Information & Management	Users of Web Portals	Quantitative	Integrating perceived playfulness into expectation-confirmation theory provides extended insights into continued use of web portals	Use of only student sample
5. Hong, Thong, and Tam (2006)	Understanding Continued Information Technology Usage Behaviour: A Comparison of three	ECT , TAM, and a hybrid of both models	Decision Support Systems	Mobile Internet Users	Quantitative	ECM and TAM, collectively account for more variance than	On-line Survey

	Models in the Context of Mobile Internet	Perceived Usefulness, Perceived Ease of Use, Confirmation, Satisfaction, Continued IT Usage Intention				individually	
6. Limayem, et al. (2007)	How Habit Limits the Predictive Power of Intention: The Case of Information Systems Continuance	IS PAM and Habit	MISQ	Users of WWW	Quantitative	Habit exerts a moderator effects on IS continuance intention and usage behaviour	Use of only student sample
		Comprehensiveness of usage, Habit, Frequency of Behaviour, IS continuance usage					
7. Wu, Gerlach, & Young (2007)	An Empirical Analysis of Open Source Software Developers' Motivation and Continuance intention	Expectancy Value Theory	Information & Management	Open Source Software Developers	Quantitative	Satisfaction, motivation of enhancing human capital, and satisfying personal needs, in this order, have strength of influence on OSS participants' intention to participate in future projects.	Non-response bias
		Motivation on: helping, enhancing human capital, career advancement, satisfying personal needs.					
8. Chiu et al. (2007)	Examining the Integrated Influence of Fairness and Quality on Learners Satisfaction and Web-based Learning Continuance Intention	IS Success Model and Fairness Theory	Information Systems Journal	Students of a Web-based Learning Service	Quantitative	Information Quality, Systems Quality, Distributive Fairness, Interactional Fairness, and System Use influence satisfaction with Web-based learning, whilst procedural fairness and Satisfaction influence intention to continue using Web-based Learning.	Self-Selection Bias
		Information quality, System quality, Service Quality, System Use, Satisfaction, Distributive Fairness, Procedural Fairness, Interactional Fairness, Continuance Intention					

9. Bhattacherjee et al. (2008)	Information Technology Continuance: A Theoretical Extension and Empirical Test	ECM, & TPB Post-usage usefulness, Disconfirmation, Satisfaction, IT Self-Efficacy, Continuance Intention, Facilitating Conditions, Continuance Behaviour	Journal of Computer Information Systems	Staff at a governmental agency in Ukraine	Quantitative	IT Self-efficacy influences Continuance intention whilst Facilitating Conditions influences continuance behaviour	Small sample size of 87.
10. Limayem & Cheung (2008)	Understanding information systems continuance: The case of Internet-based learning technologies	IS PAM, prior behaviour and Habit Perceived Usefulness, Confirmation, Satisfaction, IS Continuance Intention, Prior Behaviour, IS Continued Use, and Habit	Information & Management	Students users of internet based technology	Quantitative	Prior behaviour and habit have a significant effect on IS use	Use of only student sample
11. Chiu & Wang (2008)	Understanding Web-based Learning Continuance Intention: The Role of Subjective Task Value	UTAUT and Subjective Task Value Attainment value, utility value, intrinsic value, social influence, facilitating conditions, effort expectancy, performance expectancy, computer self-efficacy, social isolation, anxiety, delay in responses, risk of arbitrary learning	Information & Management	Part-time students subscribed to Web-based Courses	Quantitative	Performance expectancy and Utility Value had similar effects on continuance intention of part-time students	Self-selection Bias

12. Roca & Gagne (2008)	Understanding e-learning continuance intention in the workplace: A self-determination theory perspective	Self-determination theory and TAM Perceived autonomy support, perceived competence, perceived relatedness, perceived usefulness, perceived playfulness, perceived ease of use, e-learning continuance intention	Computers in Human Behaviour	Employees of four international agencies of the united nations	Quantitative	Perceived competence influences perceived usefulness. Perceived ease of use is a significant antecedent of perceived usefulness. Perceived playfulness determines perceived usefulness and ease of use.	Self-selection bias
13. Larsen et al. (2009)	The role of task-technology fit as users' motivation to continue information system use	IS PAM & TTF Perceived task technology fit, utilization, Perceived Usefulness, Confirmation, Satisfaction, and IS continuance	Computers in Human Behaviour	University /College teachers	Quantitative	TTF variables and PAM variables are complimentary determinants of continuance intention	Use of only student sample.
14. Zhou (2013)	An empirical examination of continuance intention of mobile payment services	IS success Model and Flow theory system quality, information quality, service quality, flow, trust, satisfaction	Decision Support Systems	Users of Mobile Payments	Quantitative	System, service, and information quality affect continuance intention through trust, flow and satisfaction. Also, trust affects flow which affect continuance intention.	Sample was confined to an eastern city in china.
15. Bhattacherjee & Lin (2014)	A unified Model of IT Continuance: three complementary perspectives and crossover effects	ECT, Habit, & Subjective Norm Perceived usefulness, disconfirmation, satisfaction ,Habit, subjective norm, continuance intention and	European Journal of Information Systems	Insurance Agents	Quantitative	Experiential response and reasoned action are key drivers of continuance behaviour, and continuance behaviour can be influenced through habit	Sample consists of only employees of an insurance agency

		continuance behaviour					

To present a holistic view of all noted factors in table 3.2 above, the researcher adapts a taxonomy employed by Hong et al. (2008). These scholars reviewed extant studies on continuance intention that integrated theories and models, and categorize the determinants of continuance intention. The categories are *behavioural beliefs, object based beliefs, attitude, previous behaviour, behavioural intention, and continued use behaviour*. Given advancements in the continuance literature, Islam (2012), presents additional categories (*social factor and control beliefs*) to classify continuance-determinants. Through these lenses, table 3.3 below, presents definitions of the categories, while fig 3.4 presents taxonomy of the reviewed continuance studies in table 3.2, and table 3.4 maps the depicted relationships to extant studies.

Table 3.3 Continuance taxonomy definitions

Factor Category	Definition
Object-based beliefs	Factors that examine the characteristics of the target technology (Hong et al. 2008)
Behavioural-based beliefs	Factors that examine the consequences of the technology's use (Hong et al. 2008)
Previous behaviour	Factors that capture repeated actions that often turns to routine (Hong et al.2008)
Behavioural intention	Factors that capture an individual's degree of certainty to perform a target behaviour (Fishbein & Ajzen, 1975)
Continued use behaviour	Factors that represent the sustained utilization of technology (Bhattacherjee, 2001a)
Control beliefs	Factors that facilitate the performance of the technology's use (Islam, 2012)
Attitude	A general affective reaction following use of the technology (Venkatesh et al.2003)
Social factors	Factors that examine the social influence on a user in performing technology-enabled target behaviour (Islam, 2012).

Fig 3.4 Taxonomy of factors in the reviewed continuance studies

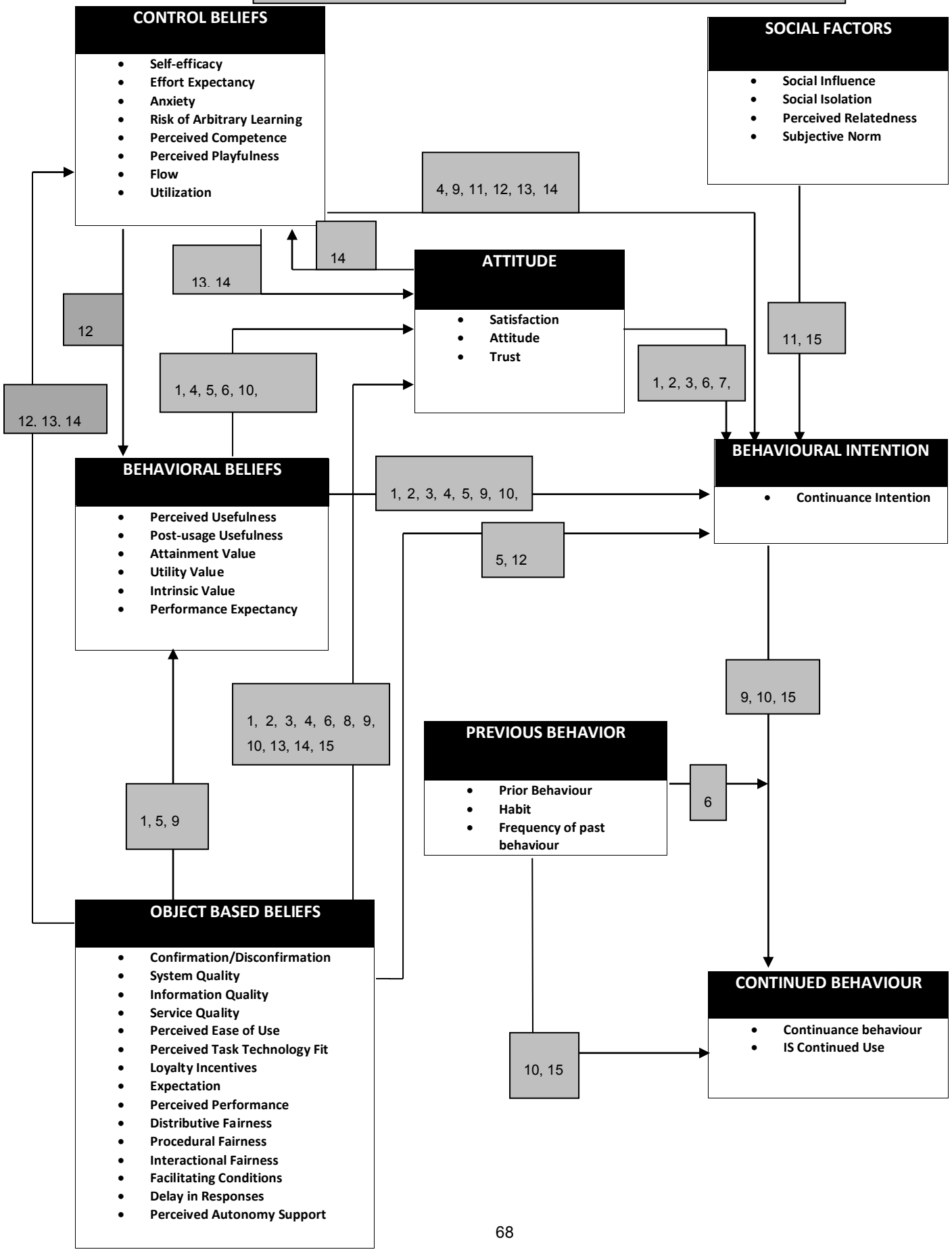


Table 3.4 References for relationship depicted in the taxonomy figure

References	
1.	Bhattcherjee, 2001b
2.	Bhattacherjee 2001a
3.	Bhattacherjee & Premkumar, 2004
4.	Lin et al. 2005
5.	Hong et al. 2006
6.	Limayem et al. 2007
7.	Wu et al. 2007
8.	Chiu et al. 2007
9.	Bhattacherjee et al. 2008
10.	Limayem & Cheung, 2008
11.	Chiu & Wang, 2008
12.	Roca & Gagne, 2008
13.	Larsen et al. 2009
14.	Zhou 2013
15.	Bhattacherjee & Lin, 2014

Given the vast number of factors presented in fig 3.4 and the varying relationships, the researcher again adopts a parochial approach. He selects factors from the original PAM (Bhattacherjee, 2001a) and factor updates in the revised model (Bhattacherjee, 2008) as base for the theoretical model. Subsequently, to minimize perceptions of random selection of factors amidst the several variables presented in fig. 3.4, the researcher selects factors across the categories of continuance determinants, mindful of Whetten's (1989) guidelines for model development (see section 3.1), and Bhattacherjee and Barfar (2001) caution on application of a mix of pre-adoption and post-adoption factors to investigate a post-adoption phenomenon.

To begin, the researcher examines the literature for censure on the PAM, in view of potential factors that can complement the model's shortcoming. Two limitations are identified upon which selection of complementary factors are based. The first identified criticism of the PAM is its lack of capacity to account for tasks (D'Ambra, Wilson, & Akter, 2013). In sequential publications (Alter, 2001a; Alter, 2001b; Alter, 2003; and Alter, 2005) contends that the intellectual community of IS must revert attention to the association between technology and task. Explicating this, Alter (2003) asserts that technology use cannot be implicit except the task it should facilitate is also examined. The contention here holds that if the features that a technology offers do not meet the needs of accomplishing a target task, individuals will cease use of the technology (Allen, 1998; Ferratt and Vlahos, 1998). To address this issue theoretically, the researcher seeks an established theoretical framework within the reviewed literature, and

identifies factors (task-technology fit and utilization) from the task-technology fit (TTF) to fill this gap.

Second, the PAM has been censured for its deficiency in producing actionable guidance for practitioners (Benbasat, 2010), as it comprises factors of behavioural beliefs. To counteract this perception, the researcher seeks alternative beliefs such as object-based beliefs, control-beliefs, and attitude to include actionable guidance for both researchers and practitioners. In retrospect to the factors presented in fig 3.4, the researcher endeavours to select complementary factors in sets from established models to ensure theoretical coherence. As such, he identifies factors (system quality, information quality, and service quality) from the IS success model as inclusions of object-based beliefs. For control-based beliefs, (utilization) is captured in the selected- TTF model and an additional factor (flow) are selected, and for attitude, the trust construct is selected. Next, the researcher gives a background to the selected models used in developing the study's model.

3.2.5 Selected Models, Theories, and Factors

3.2.5.1 Technology Task Fit

The TTF proposed by Goodhue and Thompson (1995) consist five constructs (see fig.3.5) and asserts that a technology is likely to have a positive impact on a user's performance, and will be utilized, if the features of the technology match an individual's task requirements and his or her abilities. Technology characteristics in the model refer to the features of the technology being used by an individual to perform a target task, whilst task characteristics refer to actions of an individual in converting inputs to outputs, and task-technology fit is the alignment between the task and the technology (Goodhue & Thompson, 1995). Utilization refers to the manner of employing the technology in completing a given task, and is a dual condition of use or non-use. Performance refers to the execution of a task based on the fit between the technology's characteristics, task requirement, and the individual's ability (Goodhue & Thompson, 1995). Collectively, the model holds that the higher the fit between the task and the technology, the better the performance.

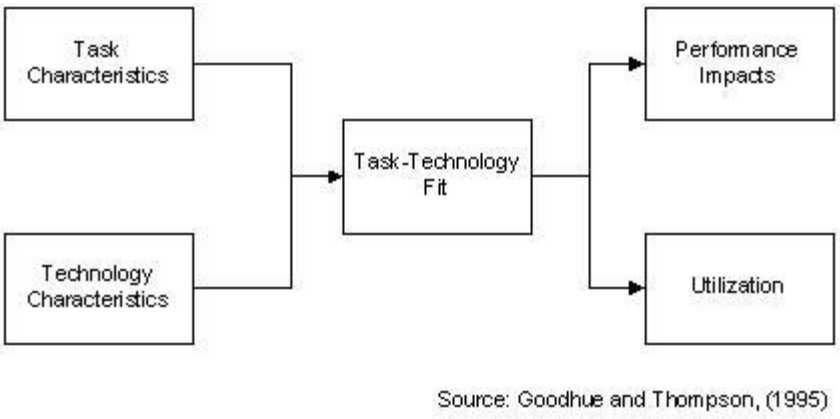


Fig 3.5 Task-Technology Fit Model

The theoretical underpinnings of the TTF can be traced to theories such as the structural contingency theory, cognitive cost-benefit theory, work adjustment theory, and organizational information processing theory.

The Structural contingency theory holds that there is no single structure or organizational type; rather an effective structure is one which fits contingencies (Donaldson, 2001). Whilst the organizational information processing theory [29] posits that organizations should have multiple strategies to cope with uncertainty and increased information needs (Premkumar, Ramamurthy, & Saunders, 2005). These theories are similar because they both assert that better performance occurs when the design attributes of an organization are 'aligned with' or 'fit' the task requirements. Hence, the similarity between TTF and these theories is their collective emphasis on the importance of fit.

Work adjustment theory[30] posits that an individual's job performance will be judged by his or her employer's perception of the extent to which the individual's talents (skills, knowledge, experience, etc.,) match with the requirements of the job. For a satisfactory performance to be attained, the individual is expected to have a reasonable match between his or her skills and the characteristics of the job task. The theory further notes that the match between an individual and an environment may not be perfect, possibly because the individual ventured into the wrong career or the employer selected the wrong candidate. However, for a functional relationship to

[29] The organizational information processing theory was proposed by Premkumar, Ramamurthy, & Saunders, 2005.
[30] The work adjustment theory was posited by Darwis, England, & Lofquist, 1964.

exist between the environment and the worker, a reasonable degree of fit between an individual's talent and the work requirements is eminent. Again, this theory emphasizes the role of fit.

Consistent with the above discussed theories, the cognitive cost-benefit theory[31]also highlights the importance of 'fit. The cost-benefit theory proposes an approach for calculating and comparing the cost and benefits of a project. The theory serves two functions: (i) to determine whether a venture is a rational investment (ii) to determine if the total expenditure for a given venture exceeds the benefits or whether the benefits outweigh the cost, and by how much. Thus, it is an evaluation of a required fit or balance between costs and benefit.

Conversely, the TTF may be considered a more generic theory that examines the fit between task requirements and technology's characteristics, as well as, the fit between a technology's characteristics and a user's capacity (Goodhue, 1998). The TTF postulates that an individual's use of a technology is dependent on the technology's fit with the requirements of a given task, and the technology's capacity to support the user in accomplishing the task (Goodhue, 1995). A misalignment between the technology's characteristics and the user's capabilities in accomplishing a task would result in a reduced task-technology fit. In turn, this misalignment impacts negatively on the individual's performance in accomplishing the given task, and will ignite negative perceptions towards the technology (Goodhue & Thompson, 1995).

The application of TTF can be seen in a range of investigations of IS use. Examples of these include: Goodhue (1995) applied TTF in understanding managerial use of quantitative data; Larsen et al. (2009) assessed TTF's role in users motivation to continue using an IS; Lin (2012) adopted constructs from the TTF in assessing fit and satisfaction on web-learning performance; Goodhue, Klein, and March (2000) investigated user evaluation of database management systems as surrogates for objective performance; Klopping and McKinney (2004) examined the influence of TTF in online shopping.

All the above mentioned studies that have applied the TTF in their investigations show results that support the TTF's postulation that a fit between the task, technology, and user will further influence other important variables.

[31] Jules Dupuit is credited with postulating the cost-benefit theory

3.2.5.2 DeLone and McLean Success Model- The origin

The IS success model was proposed by DeLone and McLean (1992) in an effort to combine extant research on IS success into a more coherent body of knowledge through which future studies may draw on. The authors' goal was to propose a yardstick for the evaluation of successful IS procedures, practices, and policies. DeLone and McLean (1992) adopted a classification developed by Mason (1978) that drew on the information theory postulated by Shannon and Weaaver (1949). The concept employed by Mason (1978) from Shannon and Weaver's (1949) information theory holds that the successful transmission of information is the goal or outcome in communication. However, barriers to attaining this goal may occur on three levels.

Level 1: The technical level- captures the accuracy of symbol transmissions.

Level 2: The semantic level- deals with the precision to which symbols representing a message are being transmitted.

Level 3: The effectiveness level- concerned with the measure of effectiveness of a message to invoke a desired behaviour in a recipient (Shannon & Weaver, 1949).

Mindful of these possible barriers, Mason (1978) proposes a framework for the assessment of the output of an IS. The author adapted two levels of the transmission barriers noted by Shannon and Weaver (1949) for the measurement of information as an output. These are (i) technical level renamed as *production*. (ii) Semantic level renamed as *product*. The third level is further segmented into meta-phases, which are concerned with: (a) receipt- the manner of acceptance by receiver, (b) receipt impact- the effect of the message on the individual, (c) system impact- the effect of the message on the system. Mason (1978) asserts that the measurement characteristics at the 'technical level' may capture characters, bits, or words. The yardstick at the semantic level could be rhetorical (i.e., words, messages, text) and also truth based (i.e., reports, queries, data records and files). Last, the impact level may be determined by the items read by recipients, items deemed useful or significant, information use, etc. Although the underpinnings of Mason's work draws on Shannon and Weaver's (1949) work, Mason's framework specifically examines output of the information process.

In sum, Shannon and Weaver's (1949) noted possible barriers of communication transmission is the take- off point for Mason's assessment of information output, while Mason's version of

Shannon and Weaver's theory provides the platform on which DeLone and McLean (1992) derived the IS success model.

3.2.5.2.1 IS success model

The IS success model (see fig 3.6 below), draws on Mason's (1978) classification, by proposing six dimensions of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. These dimensions of the IS success model, map on to Mason's model, in that, system quality is comparable to the technical level of communication, whereas, information quality is similar to the semantic level of communication (Petter & McLean, 2009). The other factors (use, user satisfaction, individual impact, and organizational impact) are mapped to mason's subcategories of the effectiveness level. More specifically, use relates to Mason's 'receipt of information,' user satisfaction and individual impact relate to 'the information's influence on the recipients,' and organizational impact relates to the influence of the information on the system. Through the lens of Mason's classification, DeLone and McLean (1992) set out to identify, classify, and examine a number of success measures, labels, and success index descriptions that have been published in some of the leading journals (MISQ, Communications of the ACM, Management Science, Decision Sciences, Journal of MIS, ICIS proceedings, and Information & Management) in the IS field through the 80's (1981-1988). This endeavour by the authors brought to light roughly 180 publications that examined IS success measures. Following their findings, the authors classify the success measures found in each study into one of the created classes in their model.

In DeLone and McLean's (1992) study, the dimensions of the IS model are characterized in the following ways: Systems quality refers to valuable features of an IS such as: ease of use, response time, reliability, ease of learning, and flexibility. Information quality refers to the valuable features of the output offered by the IS, which include, accuracy, timeliness, completeness, currency, and usability. Use refers to an individual's utilization of a system. User satisfaction refers to the degree and manner in which the functionalities of the IS are utilized. Individual impact refers to how the information system transforms the user's experience in accomplishing a task. Last, organizational impact ascertains how the system and information derived will impact the organization. Collectively, the IS success model presents a view that various dimensions of success share a dependent relationship together with causal and temporal relationships. DeLone and McLean (1992) explain that system quality and information quality affect use, and user

satisfaction. Further, use and user satisfaction are antecedents of individual impact, which affects organizational impact. For future research, DeLone and McLean (1992) suggested that researchers should apply their model in a predictive manner.

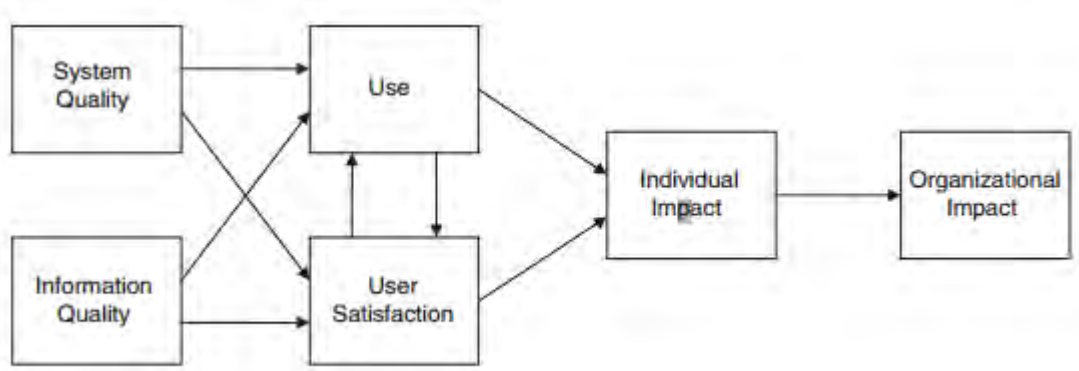


Fig 3.6 IS Success Model- 1992

3.2.5.2.2 DeLone and McLean's updated IS success Model

Within a decade of the publication of DeLone and McLean's (1992) IS success model, IS researchers have altered and extended the model (e.g., Pitt, Watson, & Kavan, 1995; Seddon & Kiew, 1996; Rai, Lang, & Welker, 2002) , while some have adapted it for the investigation of specific applications, which include: knowledge management systems (Jennex, Olfman, Panthawi, & Park, 1998; Lee, 2001), and E-commerce (Molla & Licker, 2001; Liu & Arnett, 2000; DeLone & McLean, 2004), which characterize attributes of mobile-enabled services. In recognition to the extensions, alterations, and application of their model, DeLone and McLean (2003) acknowledge some of these authors views by revising their original model to an updated version (see fig 3.7).

A vital addition to the authors updated model is the *service quality* variable (a measure of reliability, assurance, and responsiveness from the service provider). This variable was initially suggested by Pitt et al. (1995) in their paper on service quality as a measure of information systems effectiveness. DeLone and McLean (2003) included this variable within their revised model with justification that the dynamic nature of IS necessitates assessments of service quality when evaluating IS success. The authors additionally propose a need to allot diverse weights to the quality factors (system, information, and service), based on the circumstance and use of the model.

A further amendment to the model is the riddance of the individual, and organization impact variables, and their replacement with the 'net benefits' variable. This alteration was made in response to criticisms that the effect of an IS can occur beyond the individual and organization level. In response, the updated model now accounts for benefits at several levels of analysis (e.g workforce, businesses, and communities), which should be established by the researcher (Petter & McLean, 2009). A noteworthy scholar who influenced revision to the IS model is Peter Seddon. Seddon (1997) proposed a recognized re-specification of the intitial IS success model. Seddon's (1997) key concern was that the IS model possessed facets of both process and variance models, and opines that it is complicated to interpret and use. To address his concern, Seddon (1997) segmented the process and variance components. However, his revision was met with contention by DeLone and McLean (2003) whom argues that Seddon's (1997) approach made the model too complex and lacked parsimony. DeLone and McLean (2003) further argue that their original model, as a process model, comprises three components, which include building and using a system, and the consequences of the systems use. Nontheless, while all of these components were essential, they we insufficient for determining the outcome. The authors also argued in favour of the variance component of their model by specifying several experimental studies that applied their model partially or wholly, and reported some successful studies. In light of this debate, another development to DeLone and McLean's (2003) model was an explanation of the use construct. The authors explicate that *use* occurs before 'user satisfaction' procedurally, however, affirmative experience with *use* will cause increased user *satisfaction* in a causal sense. Further, an increased user satisfaction should increase intention to use, thereby increasing use. This logic forms the basis for the adding the intention to use factor in the updated model.

That said, over the years, a few scholars have embarked to validate the IS model in full. For example, Rai et al. (2002) carried out a comparative study on DeLone and McLean's model versus Seddon's model. These scholars report that Delone and McLean's model had a stronger predictive power than Seddon's model. Subsequently, McGill, Hobbs, and Klobas (2003) assessed the IS model in full, and reported four paths in the model to be insignificant. These paths are: system quality → use, information quality → use, intention to use → individual impact, and individual impact → organizational impact. This finding of insignificant paths in the model could imply that application of the IS success model must not be applied wholly as certain factors in the model might be only applicable in a given context. Still on the scrutiny of Delone and McLean's Model, certain scholars (Au, Ngai, & Cheng, 2002; Zviran & Erlich, 2003) have conducted

literature reviews to identify the weight of empirical support of the relationships proposed in the original IS model. These authors write that some of the studies report significant relationships across the model, while others report partial support for the relationships. On this note, Petter, Delone and McLean (2013) also identified studies which had employed their model in full, and they concede that findings of significance of all factors in their model were inconsistent across studies.

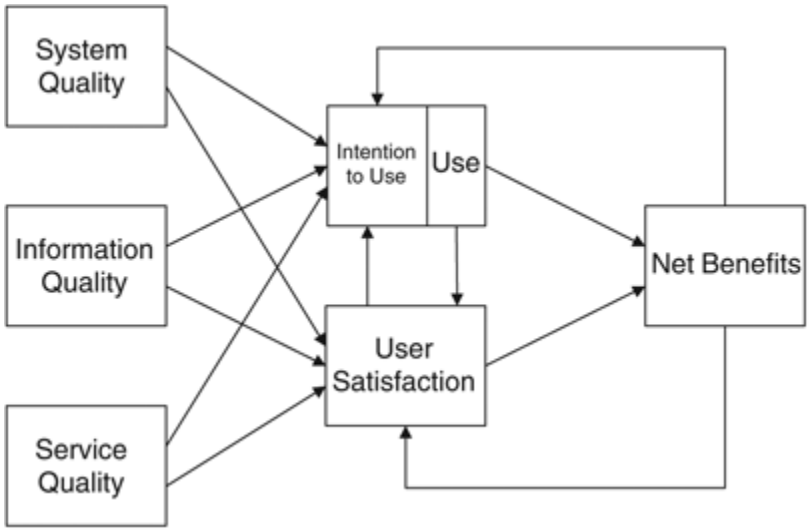


Fig 3.7 Updated IS Success Model- 2003

3.2.5.3 Flow Theory

Csikszentmihalyi and Csikszentmihalyi (1988) define flow as complete feeling that an individual experiences when he or she acts with total involvement when performing a given task. Flow research and theory originates from an investigation of the creative process in the 60's. Getzels and Csikszentmihalyi (1976) were fascinated by observation of artists who painted; when the painting was going well, an artist continued tenaciously, ignoring starvation, exhaustion, and distress, however, promptly was disinterested in the artistic design upon completion. This phenomenon became the basis for flow studies where a desire to comprehend intrinsically motivated activities: activities rewarding in sovereign (Nakamura & Csikszentmihalyi, 2014, p.240). In the context of this study, it is a mental state of operation where an individual is fully engrossed in human-computer interactivity. The theory holds that when an individual is in a state of flow, nothing else would gain his or her attention (Csikszentmihaiyi, 1990). The assertion here is that while an individual is immersed in a 'flowing' technology-enabled activity, he or she is in a state of temporal disassociation; unaware of the time being spent on the engaging activity. Also,

the individual is believed to be in a state of 'focused immersion' where his or her attention at any other task is ignored.

Originally a theory in psychology, flow theory has been adapted to diverse environments such as interactive software and online applications (Agarwal & Karahanna, 2000), athletic, shopping, and gaming (Csikszentmihalyi, 1997). From a motivation viewpoint, individuals are inclined to use a technology based on intrinsic and extrinsic motives (Davis, Bgozzi, & Warshaw, 1992). Extrinsic motivation denotes an individual's proclivity to execute an action because it should realize discrete and appreciated results (Deci & Ryan, 1985). Conversely, intrinsic motivation captures an individual's need to participate in an activity solely for the purpose of performing it (Deci & Ryan, 1985; Teo et al., 1999). As such, flow reflects characteristics of intrinsic motivation.

Flow is reckoned a complex concept, and is measured in multiple dimensions. Exemplary, Hoffman & Novak (1996) posit that flow captures dimensions such as: a flawless cycle of reactions aided by machine interactivity, sub-consciousness, intrinsic pleasure, and self-reinforcement. Li and Browne (2006) postulate that flow experience has four dimensions: focused attention, control, curiosity and temporal dissociation. Ghani, Supnick, and Rooney (1991) measured flow as enjoyment and concentration. Huang (2003) captures flow in four facets: control, attention focus, curiosity, and intrinsic interest. Last, Koufaris (2002) presents flow as a dimension of perceived pleasure, perceived control, and concentration. Collectively, the core theme of flow mirrors a balance between a user's skills and challenges when engaged in an activity, and is illustrated in fig 3.8 below.

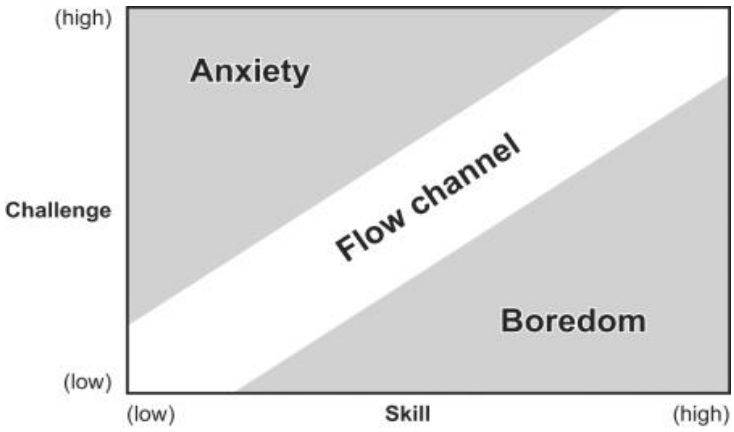


Fig 3.8 the flow (Csikszentmihalyi1990, p.74)

3.2.5.4 Trust

There are various definitions[32] of the concept of trust in the extant literature because of the spectrum of functions it plays across relationships (Barber, 1983; Jones, 2002; Grabner-Krauter, Kaluscha, Fladnitzer, 2006). Despite this assertion, the cornerstone of trust captures concepts such as expectations, honesty, faith, confidence, risk, transparency, social relationships, amongst others. Today, the concept of trust has instantiations in different social relationships. To name a few examples: Institutional (Pavlou & Gefen, 2004; Mishler & Rose, 2005), Interpersonal (Leach & Sabatier, 2005), Political (Levi & Stoker, 2000; Mishler & Rose, 2001; Kumlin, 2004), Democratic (Warren, 2004), amongst others.

Table 3.5 Definitions of trust

Author	Conceptual definition of Trust
Crosby, Evan, & Cowles, 1990.	"Confidence that a trusted party will act in the interest of the customer."
Gefen, Karahanna, and Straub, 2003, p.54	"Trust is an expectation that others one chooses to trust will not behave opportunistically by taking advantage of the situation."
Warren, 1999, p.311.	"a judgement, however tacit or habitual, to accept vulnerability to the potential ill will of others by granting them discretionary power over some good"
Dumouchel, 2005, p.425.	"to act in such a way as to give another agent power over us"
Sztompka, 1999, p.25.	"a bet on the future contingent action of others"
Giddens, 1990, p.34	"Confidence in the reliability of a person or system, regarding a given set of outcomes or events, where that confidence expresses a faith in the probity or love of another, or in the correctness of abstract principles (technical knowledge)."
Gambetta, 1988, p.217	"a particular level of the subjective probability with which an agent Assess that another agent or group of agents will perform a particular action, both before he can monitor such action (or independently of his capacity ever to be able to monitor it) and in a context in which it affects his own action."

The task of conceptualizing trust, given the variety of definitions in the extant literature, is an intrinsically straining charge. This is because the researcher has to account for a range of theoretical and empirical applications. The conceptual variety of trust thus presents a problem, as

[32] Table 3.5 presents a few definitions on trust in the extant literature.

it would be frivolous to claim that a single meaning ratifies the term (Hardin, 1999). In order to reconcile links between a study's proposed application of trust and the extant theories of trust, Gambetta (1988) cautions that the objective should not focus on producing an impressive mix of trust theory, rather a logical development of testable hypotheses that capture trust is credible. A starting point to attaining a logically developed and testable hypothesis on trust would be to draw from the theory of trust which specifies the structure and mechanisms which constitute trust. In this vein, Jones (2002) writes that there exists a thing called trust, and most theories draw on its core. As a result, there seems to be some degree of consensus on its meaning (Levi & Stoker, 2000). The extant literatures conceptualization of trust begins with a scenario of the existence of two actors, where, actor X places his trust in actor Y (Hardin, 1993, p.507). In essence, for trust to be applied, a relationship consisting of two actors must exist (Harre, 1999; Reed, 2001).

3.2.6 Application of selected theories in this study

This section demonstrates potential capacity of the discussed theories in determining user continuance intention towards M-pesa.

3.2.6.1 PAM

This study adopts three of four constructs of the original PAM (Bhattacherjee, 2001a), and one from the updated PAM (Bhattacherjee et al. 2008). Aforementioned, the original PAM is made up of four constructs (Perceived Usefulness, Disconfirmation, Satisfaction, and Continuance Intention). The researcher selects three of the four constructs and substitutes the perceived usefulness construct for an explicitly labelled construct (post-usage usefulness) to measure user perceived usefulness in a post-adoption era (Bhattacherjee et al. 2008). The revision (post usage usefulness) is particularly important for studies on continuance intention because it helps to forthrightly distinguish it from pre-usage perception of usefulness- 'perceived usefulness', and to capture an aggregated perception of usefulness long after initial use. This variable would aid capturing user explicit view of usefulness post- use of the M-pesa service.

Thus, in this study, all the aforementioned constructs of the PAM are adopted for the following reasons: (i) the dependent variable of the PAM directly captures the core objective of this study- to determine user continuance intention towards M-pesa (ii) Post usage usefulness and disconfirmation are validated as critical antecedents of user continuance intention in the literature

(iii) and satisfaction is selected based on extant findings of it being the most potent determinant in the PAM.

3.2.6.2 TTF in this study

Based on reports of the significant value of the TTF in understanding various use cases of technology-enabled product and services, this study adopts two factors (technology-task fit and utilization) from the TTF as potential antecedents and determinants of user continuance intention towards M-pesa. The selection of these two variables and omission of others in the TTF is objective and context driven. One of the RQs in this study is to identify the antecedents of user continuance intention towards M-pesa. The selected two variables from the TTF model are suggested in the literature (e.g., Larsen et al. 2009; Lin, 2012; D'Ambra et al. 2013) as antecedents of user continuance intention because a user who perceives that M-pesa's characteristics matches his or her task requirement is likely to use the service. Utilization suggests repetitive use of a technology and could therefore determine continuance intention. The other variables in the TTF model (individual characteristics, technology characteristics, and performance impacts) are excluded. The exclusion is executed because individual and technology characteristics are antecedents of TTF, which is not the core focus of the study. Thus, the selection of the TTF serves as a parsimonious and shrewd selection, given suggestions of its influence on utilization which influences continuance (Larsen et al. 2009). Last, performance impact is not included in this study because it is a dependent variable, and the focus of the present study is on user continuance intention and not performance.

3.2.6.3 IS success model in this study

The IS success model is a general model (pre-post) adopted for investigations of technology success. However, given a specific focus of this study on continuance intention- a post-adoption phenomenon, the researcher selects post-adoption applicable constructs from the model for his query. Specifically, the researcher adopts the information quality, system quality and service quality as triad facets of M-pesa attributes. This is because the extant literature on technology characteristics, examined at a general level, are reported to influence behavioural attitudes (e.g., Igbaria, Livari, & Maragahh, 1995; Lim & Benbasat, 2000; Hong, Thong, Wai-Man Wong, 2002) or behavioural outcome (Hsieh, Rai, & Xu, 2011; Setia, Venkatesh, & Joglekar, 2013). The net benefit construct, intention to use, and satisfaction construct are excluded because: (i) net benefit

is a dependent variable and this study does not seek its prediction. (ii) Satisfaction is already adopted, as it is a construct in the PAM (iii) intention to use is a pre-adoption belief and does not feature in a post-adoption era. Lastly, the IS success model has been applied to comprehend behaviour of users of mobile. For example, Chatterjee, Chakraborthy, Sarker, Sarker, & Lau (2009) executed a study to discover potential success drivers in mobile health. Lee and Chung (2009) report that perceptions of system and information quality, and visual quality influence trust and satisfaction with mobile finance. Zhou (2011) adopted the IS success model and complementary factors to assess success drivers of mobile website acceptance. Last, Zhou (2013) examined the impact of the IS success quality factors on continuance intention with technology in China. Collectively, while application of the IS success model is endorsed generally for examining use behaviour, it is infrequently assessed within a developing country perspective. Moreover, few efforts have been made to test its predictive powers in assessing user behaviour towards mobile money which is a promising technology artefact for the developing regions. Thus, extending a validation test of the model to explain use of mobile money is desirable.

3.2.6.4 Flow theory in this study

Abstractly, flow is multi-faceted, and captures aspects of perceived pleasure, control, and focus (Koufaris, 2002), interest (Ho and Kuo, 2010), and response and consciousness (Guo and Poole, 2009). Extant studies have noted that flow experience is a useful construct for describing human–computer interactions (Chang & zhu, 2012). Notably, flow experience has been examined in online contexts such as online banking (Lee, Kang, & McKnight, 2007), online games (Lee & Tsai, 2010), and mobile instant messaging (Zhou & Lu, 2011). These studies submit that flow experience is a salient determinant of user online behaviour. However, scant attention has been devoted to the role of flow experience in emerging technologies such as mobile money continuance intention. An application of the flow concept to this study captures a user's perception of the basic knowledge and skills that he or she possesses of M-pesa, possible pleasure derived during use of M-pesa, and also the challenges that he or she faces such as: operation difficulty and concerns about security of cash transfers.

3.2.6.5 Trust in this study

Trust is a core factor in the preservation of exchange relations (Blau, 1964). Afore-noted, the concept of trust captures a setup of two actors, where one actor places his trust in the other

(Hardin, 1993, p.507). This scenario is reflected in the mobile money environment, where a user makes a transaction, believing that the M-pesa vendor will deposit, transfer, and permit cash withdrawals as per agreed protocols.

Technology users (M-pesa users) possess finite knowledge and psychical assets, and hence seek to ease the insecurity and intricacies of online transactions by applying cognitive short-cuts (Grabner-Kraeuter, 2002). A valuable psychological alternative is trust, which could be a means to reduce the intricacies of human behaviour in circumstances of incertitude (Luhmann, 1989). Due to finite influence on the vendor and the absence of verified assurances that a vendor will not act opportunistically; trust becomes a necessary aspect of online-based transactions (Gefen et al. 2003). To define the proposed role of trust in this study, the researcher adopts the conceptualization of trust as applied in an e-commerce context in the extant literature. A study by Gefen et al. (2003) is a preferred starting point, as the scholars conducted a rigorous study on 'trust' in on-line shopping, and this work has become one of the most cited articles in trust based studies in the IS literature. Trust as a concept in Gefen et al's. (2003) study can be said to institutional because in an e-commerce context, a customer would usually make a purchase or transaction without dealing face-to-face with an individual. The customer is said to deal with a legal business entity, hence the term institutional trust. The researcher's decision to align the present study's conceptualization of trust with the aforementioned study is due to the like nature of both studies. They both focus on consumer use of an on-line technology platform. As such, trust is applicable to this study because M-pesa is a vendor (entity X), and provides services to user's (entity Y). Both entity X and Y have an agreed upon way of providing and using services, and this exchange relationship is contingent upon both parties ability to interact as established. Therefore, M-pesa users have expectations and perceptions of several factors related to an M-pesa service, and M-pesa's has a duty to deliver on the agreed upon service to its users.

3.3 Causal Logic and Conceptual Model

To explain a fact is to exhibit the mechanisms that make the system in question tick~ **(Bunge, 2004, P.182)**

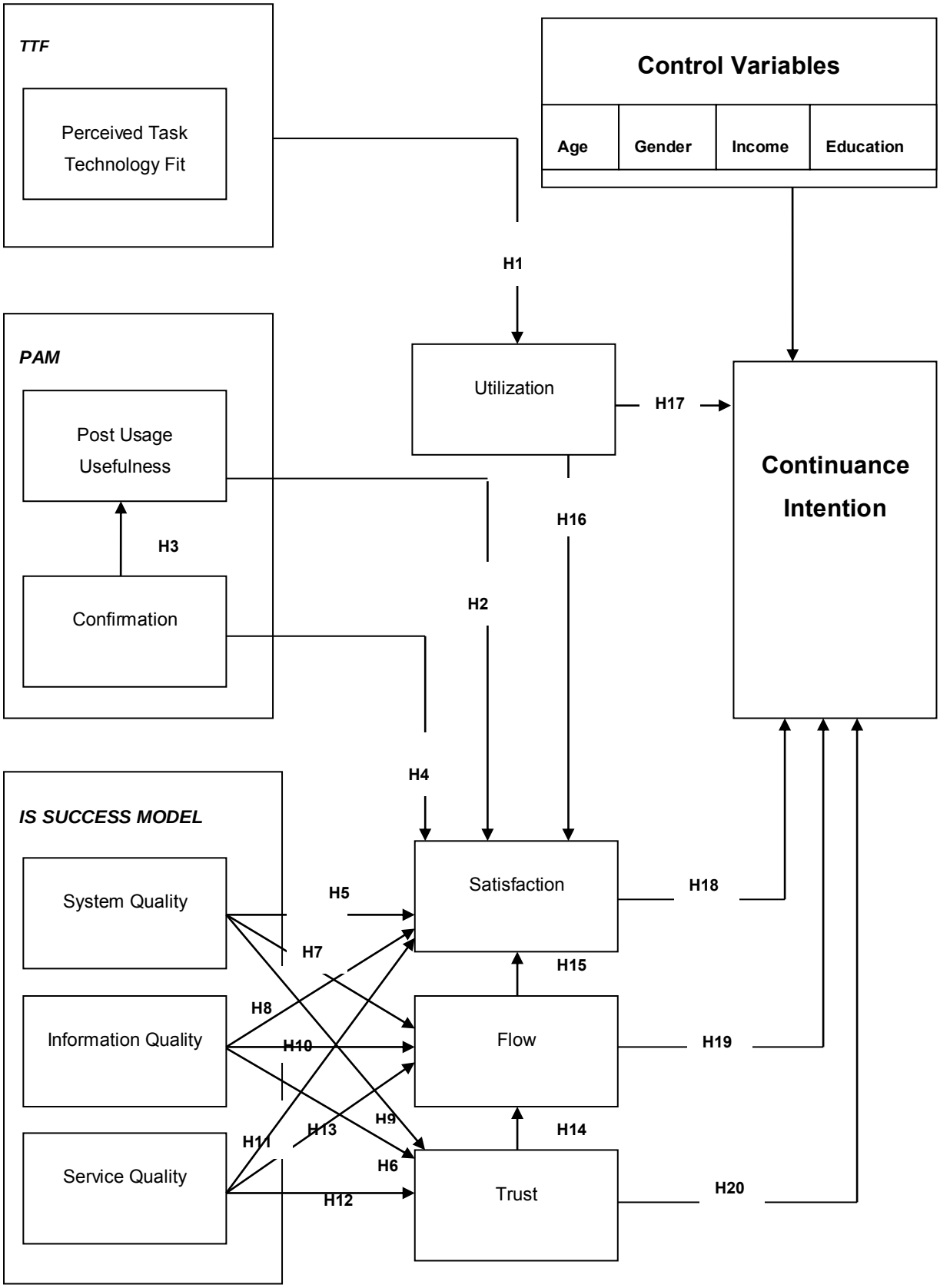
In this section, the researcher outlines the relationships between variables in the discussed models and theories; and a particular consequence with one event leading to another.

Table 3.6 Causal logic of influences amongst variables within the discussed models and theories

Constructs Association	Causal Logic
1. Task Technology Fit → Utilization	Task Technology fit influences utilization because a user will use a technology if his or her ability match the characteristics of a technology that can facilitate his or her given task (Goodhue & Thompson, 1995). Conversely, unmatched abilities to characteristics of technology will impede a user's utilization of M-pesa.
2. Post-Usage Usefulness → Satisfaction	Post usage usefulness influences satisfaction because a user will feel content with a technology-enabled service if his or her aggregated perception of usefulness are in the affirmative (Bhattacherjee, 2001a; Bhattacherjee et al. 2008; Bhattercherjee & Lin, 2014). However, where aggregated perceptions of usefulness are in the negative, dissatisfaction would be felt (Bhattacherjee, 2001a).
3. Confirmation → Post-usage Usefulness	Confirmation influences post-usage usefulness because the user would possess first-hand experience with the service and can form an experiential based opinion (Bhattacherjee et al.2008; Bhattacherjee & Lin, 2014).
4. Confirmation → Satisfaction	Confirmation influences satisfaction because parity between expectation and actual experiences would yield contentment (Bhattacherjee, 2001a; Bhattacherjee & Lin, 2014; Venkatesh & Goyal, 2010). However, a disparity between expectations and actual experiences would yield discontent.
5. System Quality → Satisfaction	System quality influences satisfaction because a quality system will ensure good user experience that would stir content. In contrast, a poor system will undermine a user's experience with the system (Wixom & Todd, 2005; Zhou, 2013; Xu, Benbasat, & Cenfetelli, 2013).
6. Information Quality → Trust	Information quality influences trust because a system that provides users with accurate information about their accounts will be trusted (Nicolaou & McKnight, 2006; Zahedi & Song, 2008; Zhou, 2013).
7. System Quality → Flow	System quality influences flow because a user will experience a feeling of enjoyment if the quality of the system is characterized by ease of use, reliability, speed, good navigation, and an appealing interface (Zhou, 2013; Guo & Poole, 2009).
8. Information Quality → Satisfaction	Information quality of M-pesa influences a user's satisfaction with M-pesa because users need accurate information about their accounts to make transactions (Wixom & Todd, 2005; Zhou, 2013; Xu et al. 2013).
9. System Quality → Trust	System quality influences trust in M-pesa because the features of a quality system are a reflection of the ability of a vendor to offer valuable services (Vance, Elie-Dit-Cosaque, & Straub, 2008; Zhou, 2013).
10. Information Quality → Flow	Information quality of M-pesa influences flow because poor information from M-pesa will detract from the user's pleasure while using M-pesa, while quality information adds to user gratification of the service (Jung, Perez-Mira, & Wiley-Patton, 2009; Zhou, 2013).

11. Service Quality → Satisfaction	Service quality influences satisfaction because superior services will always be received by a user with pleasure, while inferior services will be tolerated with discontent (Kuo, Wu, & Deng, 2009; Zhou, 2013; Xu et al. 2013).
12. Service Quality → Trust	Service quality influences trust in M-pesa because superior services provide users with a sense of assurance, while inferior services will arouse reservations towards the vendor (Liu, Guo, & Lee, 2011; Zhou, 2013).
13. Service Quality → Flow	Service quality influences flow because a reliable service allows for a complete pleasurable involvement when performing a given transaction but an unreliable service will hamper a complete pleasurable involvement while engaging with the service (Fan, Lee, & Kim, 2013; Zhou, 2013).
14. Trust→ Flow	Trust influences flow because an individual must have confidence in a service to derive pleasure from using the service (Hoffman & Novak, 1996; Zhou, 2013).
15. Flow → Satisfaction	Flow influences satisfaction because an enjoyable activity will contribute to fulfilment of the participant (Lee et al. 2007; Zhou, 2013).
16. Utilization → Satisfaction	Utilization influences satisfaction because repeated use of a service demonstrates contentment (Bolton & Lemon, 1999; Larsen et al. 2009).
17. Utilization→ Continuance	Utilization influences continuance intention because voluntary repeated use of the service will build up towards the user's continuation plan (Larsen et al. 2009).
18. Satisfaction → Continuance	Satisfaction influences continuance intention because a content user will continue using the service for his or her target task (Liu et al. 2011; Zhou, 2013).
19. Flow → Continuance	Flow influences continuance intention towards M-pesa because a user will engage in an enjoyable activity that facilitates his or her accomplishment of a task (O'Cass & Carlson 2010).
20. Trust → Continuance	Trust influences continuance intention towards M-pesa because a user's confidence in a service will foster a continued relationship (Luo et al. 2010; Benamati, Fuller, Serva, & Baroudi, 2010).

Fig 3.9 Conceptual Model



3.4 Hypotheses

The continuance intention variable is selected as the criterion variable for this study because it is the variable being predicted. Context for its selection is discussed next.

3.4.1 Dependent Variable- Continuance Intention

The success of a technology-enabled service, such as M-pesa is dependent on continued use rather than initial acceptance (Bhattacherjee 2001a; Limayem et al. 2007), as a technology-enabled service is not reckoned successful if its utilization is not supported by the persons who seek benefits in its offerings (Bhattacherjee & Lin, 2014). Thus, a technology vendor's ability to retain existing consumers' is dependent on knowledge of factors that promote or inhibit user continuance intention towards his or her service. This view has fostered a germinating body of enquiry in this domain of continuance theory (Akter, D'ambra, & Ray, 2011). In the quest of continuance inquiry, this study defines continuance intention as a *user's self-reported intent to continue using M-pesa for transactions, as well as, the user's preference for the use of M-pesa over similar available services or methods for transacting.*

3.4.2 Independent Variables

A user's perceived task-technology fit of M-pesa is a probable antecedent of user intention to continue using M-pesa because to ensure utilization of a technology, it must facilitate completion of a task (Lu & Yang, 2014). This proposition is consistent with the core tenet of TTF that a technology will be utilized if the functions available to the user support (Fit) the activities of the user. In essence, an individual is likely to use a technology that has features which match his or her task requirements and capabilities (Goodhue & Thompson, 1995). In this study, where an M-pesa user is convinced that M-pesa is relevant for the execution of his or her task (sending money and receiving money) and that he or she possesses the ability to use it, then he or she will be inclined to utilize it. Further, should an M-pesa user opt to explore, adapt, and use one of more functionalities (sending/receiving money) of M-pesa, the drive behind this behaviour is likely that the perceived task technology fit influences his or her utilization. The relationship between TTF and utilization is reported in extant studies (e.g., Larsen et al. 2009; Lin, 2012; D'Ambra et al. 2013) Thus, this study's first hypothesis:

H1- *A user's perception of task technology fit is positively associated with his or her utilization of M-pesa.*

The relationship between post-usage usefulness and satisfaction is PAM-based. Bhattacherjee (2001a) applied the PAM to investigate the influence of cognitive beliefs (perceived usefulness) and attitude (satisfaction) on user continuance intention towards an online-banking service. Following his empirical findings, Bhattacherjee (2001a) reports that perceived usefulness is a significant predictor of user satisfaction. Usefulness in the PAM represents affirmative understanding about the performance of the technology-enabled service, and will capture the user's target goals. In this study, the perceived usefulness construct is labelled- post-usage usefulness, which is a measure of a user's aggregated perception of the instrumentality of a technology (Bhattacherjee et al. 2008). The pre-requisite for this perception is that a user finds a given technology (M-pesa) to be useful over a period of time from initial use. Post-usage usefulness is distinct from perceived usefulness (pre-usage usefulness) as users have gained first-hand experience with the technology. Conversely, pre-usage usefulness is informed by grapevine information (e.g., vendor claims) and individuals lacks experience-based opinions (Bhattacherjee & Lin, 2014). From a IS perspective, Bhattacherjee (2001a) defines satisfaction as a user's affect or feeling about his or her prior IS use. This feeling measures the degree of contentment toward a technology-enabled service (M-pesa), where the higher the degree of content, the higher the degree of willingness to use it. Further, in a human–computer interaction context, user satisfaction is typically envisaged as the expression of affection realized from interaction with the system. In essence, the subjective sum of interactive experiences influenced by several affective mechanisms in the interaction (Lindgaard & Dudek, 2003). Together, post-usage usefulness and satisfaction are posited to have a causal link because satisfaction reflects a favourable attitude of a consumer which flows from perceptions of instrumentality of the technology in use. Favourable attitudes are reactions to durable consistency of interactions between a technology-enabled service and the user (Delgado & Luis, 2001). Following each transaction, the user's perception is updated with new information. This update process determines the level of satisfaction at any given time (Day, 1984). Consistent with this view, the researcher postulates that an M-pesa user who has accumulated perceptions of usefulness towards the service is most likely to feel satisfied. Corroboration for the relationship between post-usage usefulness and satisfaction is evident in the literature (e.g., Lee, Choi, Kim, & Hong, 2007; Recker, 2010; Lin, Wang, Wang, & Lu, 2014) Thus, this study's second hypothesis:

H2- *A user's perception of post-usage usefulness is positively associated with his or her satisfaction with M-pesa*

Confirmation is the inconsistency between expectation and actual experiences (Oliver, 1980). Beyond expected outcomes lead to positive confirmation, whilst beneath expected outcomes leads to negative confirmation (Churchill & Surprenant, 1982; Kopalle & Lehmann, 2001). The causal flow goes: i) contact with information about a product's features initiates the formation of artefact exact beliefs or expectations of the consumer (Olson and Dover, 1979); (ii) a mental evaluation between expectations and actual experiences initiates a subjective reckoning of confirmation (Oliver et al. 1994); and (iii) a permutation of expectations and disconfirmation establishes the satisfaction level that will influence repurchase intentions (Venkatesh & Goyal, 2010). In the IS PAM, confirmation is posited to influence perceptions of usefulness, which is an argument consistent with the CDT (Festinger, 1957). Through a CDT lens, Bhattacherjee (2001a) argues that technology users' confirmation of expectation asserts a positive influence on their perception of usefulness because it affirms their perception of reality. To further exemplify this, Bhattacherjee (2001a) writes that a user could project low initial usefulness perceptions towards a new technology due to uncertainty of expectation of use. However, the user may still opt to accept the technology with a plan to make his or her use experience a baseline for establishing their perception.

Whilst low perceptions of usefulness are often derived prior to technology use, these perceptions could be adjusted higher due to the confirmation experience; when users realize that their initial perceptions were idealistically low (Bhattacherjee, 2001a). In this vein, the CDT holds that users of technology will experience psychological tension where their perception of usefulness towards a technology is disconfirmed during actual use. As such, confirmation of expectation stands to increase user perception of the usefulness of a technology, whilst disconfirmation stirs negative perceptions towards the technology. Some extant studies that validate the relation between confirmation and usefulness include: (Lin et al. 2005; Roca et al. 2006; Limayem & Cheung, 2008; Liao et al. 2009; Lee, 2010; Bhattacherjee & Lin, 2014). Consistent with these findings, this study conjectures that where a user of M-pesa experiences better than expected outcomes with the technology-enabled service, his or her expectations would have been confirmed in the affirmative (Venkatesh & Goyal, 2010). In this case, the user of M-pesa experiences a pleasant surprise that serves to tone down any pessimistic notions of disconfirmation, and therefore increases his or her perception of usefulness in a post-adoption era. Thus, this study's third hypothesis:

H3- *A user's high-level confirmation is positively associated with his or her post-usage usefulness with M-pesa.*

The relationship between confirmation and satisfaction is postulated within the PAM (Bhattacherjee, 2001a; Bhattacherjee et al. 2008; Bhattacherjee & Lin, 2014). Backtracking to the ECT, it posits that user satisfaction is predicted by two constructs: expectation of the technology and confirmation of expectation subsequent to actual use. Expectation offers the foundation against which confirmation is evaluated by users to resolve their evaluative response or satisfaction.

Reverting to the PAM, Bhattacherjee (2001a) explains that confirmation positively influences satisfaction with utilization of a technology because it involves recognition of the anticipated gains of the technology's use, whereas negative confirmation means unachieved expectation. The PAM illustrates satisfaction as the general affecting state ensuing from users' confirmation of expectations from previous technology usage experiences (Bhattacherjee, 2001a). Within the PAM, feelings of satisfaction occur when an individual evaluates his or her pre-usage expectations (perceived usefulness) with the technology's performance during actual usage. Where perceived performance surpasses preliminary beliefs then users realize confirmation and satisfaction. Conversely, where perceived performance do not meet expectations then expectations are disconfirmed and users are dissatisfied. The relationship between confirmation and satisfaction is validated in extant studies (e.g., Sursala et al. 2003; Lin et al.2005; Limayem & Cheung, 2007; Bhattcherjee et al. 2008). In light of the above discussions and consistent with these studies, it is expected that where a user of M-pesa's expectations of the service are confirmed (i.e., service level experience with M-pesa exceeds initial expectation), he or she is likely to be satisfied. Thus, this study's fourth hypothesis:

H4- *A user's high-level confirmation is positively associated with his or her satisfaction with M-pesa.*

The architects of the IS success model: DeLone & McLean (1992; 2003) characterize system quality as desired characteristics of a technology. These scholars further explain that the quality of a system is assessed by its level of ease of use, response time, reliability, access speed, interface appeal, and navigation. A user's positive perception of these features is an indicator that the system is of good quality, whereas, a negative perception of these attributes indicates that the system is of poor quality. In the context of M-pesa, it is a mobile-based technology service. This implies that M-pesa is characterized by the attributes of Delone and McLean's (1992:2003)

taxonomy of systems quality. M-pesa users make transactions using the M-pesa system and would desire an easy to use service, quick response time, an appealing interface, and friendly navigation, to have a good user experience with the system. If the system fails to deliver these desired characteristics, it would be deemed poor, and would have undermined the user experience (Zhou, 2013). Satisfaction is associated with system quality, in that; it is the extent to which a technology aids a user to create value for him or herself. Perceptions of a system aided value cannot be established where a user's interaction with a system is poor or undermined. Thus, perceptions of systems quality in the affirmative are more likely to induce feelings of satisfaction in the user towards M-pesa, whilst perceptions in the negative will provoke dissatisfaction towards M-pesa. The relationship between system quality and satisfaction is demonstrated in extant studies (e.g., Zhou, 2013; Lin, Fan, & Chau, 2014). Thus, this study's fifth hypothesis:

H5- *A user's high-level perception of system quality is positively associated with his or her satisfaction with M-pesa.*

A system which possesses features that are easy to use, reliable, fast, good navigation, appealing interface, etc., is one which is likely to be considered of good quality (DeLone & McLean, 1992; 2003). These attributes are desired to maximize a users experience with a system by captivating the user while executing a system-aided target task (Zhou, 2013). As such, a user of a system, whom is fully focused on the system-aided activity, is considered to be in a state of flow. Flow is a holistic sensation that an individual feels when fully immersed in an activity (Csikszentmihalyi & Csikszentmihalyi, 1988). The characteristics of system quality are requisite attributes that induce a flow experience. To exemplify this, an attribute of a good system is ease of use, and flow posits that an individual can only be fully immersed in an activity where his or her skills and challenges are at parity (Csikszentmihalyi, 1997). In essence, an easy to use system is likely to match the skills of most users, if it presents minimal challenges, and would thus enable an environment for full immersion in pleasurable human-computer interactivity. M-pesa is a service involving human-computer interactivity, and technology vendors seek to provide a captivating experience for users of their system. A captivated or flowing user of M-pesa is likely to continue use of a system because his or her skills counter the challenges while using the system, yielding target gain of the system use. This is the desire of every technology vendor for it users (Bhattacherjee, 2001a). Thus, a system with good quality features is likely to enhance user flow experience with the system (Zhou, 2013). To buttress this view, extant studies, e.g., Guo and Poole (2009) report that flow with a system is negatively affected where the aforementioned

features of a system are perceived to be poor. Similarly, Finneran & Zhang (2003) report that flow antecedents are contingent upon an individual, task, skills, and artefact pairing. Consistent with these views, this study's sixth hypothesis:

H6- *A user's high-level perception of system quality is positively associated with his or her flow with M-pesa.*

Afore-noted, the architects of the IS success model: Delone and McLean's (1992; 2003) present an assessment grid (ease of use, response time, reliability, access speed, interface appeal, and navigation) of system quality and assert that users desire these characteristics of a system. Given it is a IS success model, informed technology vendors in an attempt to attract and sustain users will endeavour to present their systems to users, with claims that their systems encompasses characteristics of these nature. Users would then adopt and use a technology-enabled service with expectations that the vendor would deliver on its claims. The vendors claim and the users' expectation is an exchange relationship that requires social glue, which is trust. Trust is the key element in the preservation of exchange relations (Blau, 1964), such as one between a technology vendor and a user. Trust is the bond in a setup of two actors, where one actor places his expectation in the other at a vulnerable expense (Hardin, 1993, p.507). As such, an M-pesa user accepts and uses the service with the belief that the vendor will deliver a system that exhibits characteristics of system quality. Thus, with this agreement, where a user's perceptions of a systems quality are in the affirmative; the user is likely to trust the service because the vendor has delivered as expected. Conversely, where a user perceives the qualities of the system in the negative, the exchange relationship would be unreliable and lead to mistrust. The relationship between system quality and trust has been demonstrated in extant studies (e.g., Zhou, 2013; Vance et al. 2008). Thus, this study's seventh hypothesis:

H7- *A user's high-level perception of system quality is positively associated with his or her trust in M-pesa*.

Information quality refers to the quality of the output offered by the IS, which includes: accuracy, timeliness, and completeness, currency, and usability (DeLone & McLean, 1992; 2003). Users' of M-pesa employ the service to make transactions ranging from P2P[33] to P2B[34] , and require

[33] P2P is an acronym for transactions made by a person to another person.

account information in real-time. Information quality in an M-pesa context requires the M-pesa systems capacity to ease the intensity of uncertainty of the user. This is because the interaction between the user and M-pesa is conducted via mobile wireless technology, void of material ties between the two entities. Therefore, the user needs to be convinced of the information being presented to him or her at every point in time. Information received from M-pesa that embodies the characteristics of information quality will be well received by user and would leave the user satisfied. Whereas, inaccurate information by the M-pesa system could undermine user experience as it will necessitate user dreaded effort towards information scrutiny; escalating operational complexity and stirring feeling of discontent (Zhou, 2013, p.1087). Users would be disgruntled because the standard expectation is to receive quality information from M-pesa system. In the event that information for use of the service and a user's account information are found to be irrelevant or inaccurate, the user will feel dissatisfied with the use of the service. The relationship between information quality and satisfaction is reported in extant studies (e.g., Delone & McLean, 1992; 2003; Seddon & Yip, 1992; Wixom & Todd, 2005; Chiu et al. 2007; Zhou, 2013). Consistent with these scholars' findings, the researcher posits this study's eighth hypothesis:

H8- *A user's high-level perception of information quality is positively associated with his or her satisfaction with M-pesa.*

Information from M-pesa that characterizes information quality: timely, complete, accurate, and current is likely to contribute to a user's positive experience while using M-pesa (DeLone & McLean, 1992; 2003). A feeling of enjoyment while using M-pesa is likely to be realized if the user perceives that the information he or she is provided with is of high quality. Further, a user's skills (read and utilize the information for a transaction) will likely surpass the challenges (a need to scrutinize information from M-pesa) if the information from M-pesa is accurate, timely, complete, and current. Where information quality is perceived to be of low quality, the user will require time to pore over the information provided (Zhou, 2013). This time spent on poring over information detracts a great deal from the user's interaction with the system. The relationship between information quality and flow is evident in some studies (e.g., Zhou, 2013; Zhou, 2014; Cheng, 2014). Thus, this study's ninth hypothesis:

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[34] P2B is an acronym for transactions made by a person to a business.

H9- *A user's high-level perception of information quality is positively associated with his or her flow with M-pesa.*

Information quality is attributed to a systems offering of information in view of timeliness, completeness, accuracy, currency (Delone & McLean, 1992; 2003). Users of a system such as M-pesa have expectations that the service would provide information within a reasonable level of the aforementioned basis. These expectations are based on trust; the key element in the preservation of exchange relations (Blau, 1964). The M-pesa user places his or her trust in the vendor at a vulnerable expense. Where M-pesa's information quality falls short of a user's expectation, the user's trust level in M-pesa will be lowered. In contrast, where M-pesa information quality matches a user's expectation, he or she is likely to have a higher level of trust in M-pesa. References for the link between information quality and trust are reported in the literature (e.g., Nicolaou & McKnight, 2006; Zahedi & Song, 2008; Zhou, 2013). Consistent with these findings, the researcher presents this study's tenth hypothesis:

H10- *A user's high-level perception of information quality is positively associated with his or her trust in M-pesa.*

Service quality refers to support that a user of a system receives from a vendor (DeLone & McLean, 1992), and is characterized by empathy, reliability, personalization, responsiveness, and assurance (DeLone & McLean, 1992; Zhou, 2013). It encompasses any contact that is directly or indirectly related to a service offered by the vendor to a user to aid the user experience. A service is considered to be of good quality where there are zero defects or it conforms to requirements (Parasuraman et al. 1985; Crosby, 1979). M-pesa being a mobile technology-enabled money transfer service would require, for example: quick response time to account balances. A user of M-pesa would therefore have expectations of the service as agreed upon with the service provider. Should the service provider fail to deliver services as stipulated to the user, it has failed to conform to requirement and is likely to provoke feelings of discontent within the user. Conversely, conformance to requirement is likely to induce feelings of satisfaction towards the service provider. Service quality has been reported to influence satisfaction in extant studies (e.g., Deng, Lu, Wei, & Zhang, 2010; Kuo et al. 2009). Thus this study's eleventh hypothesis:

H11- *A user's high-level perception of service quality is positively associated with his or her satisfaction with M-pesa.*

Afore-noted, Delone and McLean (2003) refer to service quality as the support that a user of a system can access from his or her service provider. Specifically, service quality embodies merits such as: empathy, reliability, personalization, responsiveness, and assurance (DeLone & McLean, 1992; Zhou, 2013). With M-pesa, where a user experiences unreliable connections (a reliability issue) and slow responses (a responsiveness issue), this is likely to detract from the user's experience with the service. Also, an unreliable connection while using M-pesa could upset the user, as it detracts from the perceived enjoyment and control over the system. Moreover, a service that hampers control over the system would hamper an environment for full immersion in pleasurable human-computer interactivity. Conversely, where connections are reliable and system responses are optimal, the user will be exposed to a possible sui generis flow experience that M-pesa has to offer. The link between service quality and flow is evident in the extant literature (e.g., Hsu, Chang, & Chen, 2012; Zhou, 2013; Cheng, 2014). Thus, this study's twelfth hypothesis:

H12- *A user's high-level perception of service quality is positively associated with his or her flow with M-pesa.*

As asserted by Parasuraman et al. (1985) and Crosby (1979), quality is present in a service when it conforms to requirements and has no defects. In an M-pesa context, service quality would encompass user perception of timely, prompt, or personalized services. A user, prior to adopting a service, has expectations of which the vendor should fulfil (Oliver, 1980; Bhattacherjee, 2001a). The vendor would usually have outlined the offerings of the service and user expectation in form of a service level agreement. This is a pact that each party is expected to discharge. Failure on the vendor's part to deliver on expected offerings will lead to reservations about his or her credibility. A vendor's credibility is an attribute of trust which is vital for an exchange relationship (Blau, 1964). Once this social glue- trust is broken, it would be difficult to mend. As such, a vendor's ability to provide quality services demonstrates competence and goodwill (Zhou, 2013). Extant studies to support the link between service quality and trust include: (Gefen, 2002; Liu, et al. 2011). Thus this study's thirteenth hypothesis:

H13- *A user's high-level perception of service quality is positively associated with his or her trust in M-pesa.*

Utilization is a dual condition of use or no use of a technology (Goodhue & Thompson, 1995). Given the option of use or no use, a voluntary atmosphere is implied. A user's level of M-pesa use could then be seen as an indicator of whether he or she has identified a feature (sending or

receiving money) of the service that matches his or her task requirement. When in the affirmative, use will to lead to satisfaction with service (Gelderman, 1998; DeLone & McLean, 2003). Reports on the influence of use on satisfaction in the IS literature is quite vague. For example DeLone and McLean (1992) asserted that use and user satisfaction variables, share a close relationship, and therefore posit a bi-directional path between them. However, in a later paper, Delone and McLean (2003) highlight that IS use should be measured better than a rate of recurrence, thereby suggesting utilization level as a better option. These authors' further assert that a user's positive experience with a technology-enabled service will lead to user satisfaction. Thus, when utilization of technology is voluntary, a user will use aspects of the technology that facilitate personal goals, and refrain from aspects that do not yield target gains (Larsen et al. 2009). Causal reports of utilization and satisfaction are evident in the extant literature (e.g., Delone & McLean, 1992; Larsen et al. 2009; Chang, Chang, Wu, & Huang, 2015). Thus, this study's fourteenth hypothesis:

H14- *A user's utilization is positively associated with his or her satisfaction with M-pesa.*

Flow is expressed as a holistic sensation that an individual experiences when he or she acts with complete involvement (Csikszentmihalyi & Csikszentmihalyi, 1988). It is characterized by a flawless chain of reactions enabled by technology interactivity, intrinsic pleasure, loss of self-awareness, and self-fortification (Novak, Hoffman, & Yung, 2000). Given the attributes of flow, a user who is engaged in a machine-interactivity that experiences intrinsic pleasure, loses consciousness, and feels self-reinforced is likely to emerge from this experience satisfied. In an M-pesa context, a user's flow is likely to influence a user's satisfaction with M-pesa because users' anticipate a persuasive experience from using MMS (Zhou, 2013). Where this expectation of a persuasive occurrence is met or exceeded, a user is likely to be satisfied (Oliver, 1980; Bhattacherjee, 2001a). In contrast, where this expectation is unmet, the user will be dissatisfied (Bhattacherjee, 2001a). Support for the link between flow and satisfaction is documented in the literature (e.g., Lee et al. 2007; O'cass & Carlson, 2010; Zhou, 2013). Thus this study's fifteenth hypothesis:

H15- *A users high-level of flow is positively associated with his or her satisfaction with M-pesa.*

The concept of trust is applicable in a scenario with two actors: where one believes that the other would act in an agreed upon manner to a given end (Hardin, 1993, p.507). Trust grants a subjective assurance that users would obtain a superior experience in future, with the belief that a mobile money vendor has capacity, veracity, and goodwill to deliver quality services to them

(Zhou, 2013). A user of M-pesa expects the vendor to provide him or her with highest degree of service that would maximize user experience. Some of these expectations include but are not limited to accurate account information, reliable and fast connections, appealing interface, etc. In the absence of trust in the vendor, a user cannot expect to attain a gripping experience, and this attitude could undermine the overall user experience. However, human-computer interactivity such as use of M-pesa could enthral a user into a flawless sequence of responses facilitated by the system, induce intrinsic enjoyment, loss of self-awareness, and self-reinforcement, if the vendor delivers service that maximizes user experience. Where these aspects of the system are not perceived satisfactory by the user, he or she is unlikely to enjoy the service and be totally involved whilst using it because reservations would weigh on mind. Yet, where a user is confident that the M-pesa vendor would deliver services as promised, he or she is likely to flow whilst using the service, as nothing would interfere with the designed and anticipated experience. Findings of trusts influence on flow are evident in the literature (e.g., Wu & Chang, 2005; Zhou, Li, & Liu, 2010). Thus, this study's sixteenth hypothesis:

H16- *A users high-level of trust is positively associated with his or her flow with M-pesa.*

The acceptance of a technology-enabled service for the long-term is twofold: accepting the functions that the technology offers, and then accepting the technology (Larsen et al. 2009). Following acceptance and use of a technology, a user would typically adopt, explore, and extend the use of the technology (Jasperson et al. 2005). A user who continues to explore and extend use of the technology for target tasks would likely continue using it for the target tasks the technology's services accomplish. In an M-pesa context, a user who identifies with one or more of the functions (e.g., sending or receiving money) it offers for executing a task, will likely use it. This postulation that higher levels of technology-use would fortify a user's intention to continue use is buttressed by studies (e.g., Conner & Armitage, 1998; Davis & Venkatesh, 2004) that posit that past behaviour is a key predictor of future behaviour. Thus, this study's seventeenth hypothesis:

H17- *A user's utilization of M-pesa is positively associated with his or her continuance intention towards M-pesa.*

Satisfaction with a technology-enabled service reflects positive aggregated feelings that were developed by several dealings with the service (Kuo et al. 2009). Explicating this, Bhattacherjee (2001a) writes that it is a psychological or affective condition associated with, and consequential

of, a cognitive evaluation of confirmation of expectation. Satisfaction in a consumer-behaviour context is deemed the foundation to developing and maintaining a patriotic-base of stable customers (Oliver, 1993), because it reflects a favourable attitude of the consumer. This is a reaction to durable consistency of vendor behaviour (Delgado & Luis, 2001). Following every transaction, the individual's perception is influenced by new knowledge, and this establishes the level of satisfaction at a particular time (Flavian, Guinaliu, & Gurrea, 2006). An extant theory and model to explain the induction of satisfaction in consumers are the ECT and PAM, which are both influenced by Helson's theory of the degree of adaptation. This theory posits that the degree of an individual's satisfaction depends on the relationship between the initial expectations created and the results obtained. Thus, satisfaction depends on the difference between: what a consumer wants and what he or she attains. This logic applies to user continuance with M-pesa, where a user's satisfaction hinges on his or her wants from the service and the actual realization of this wants using the service. Should a user discern positive feelings (satisfaction) from realizing their wants with the M-pesa service, he or she is likely to continue using the service for accomplishing the task (sending or receiving money) facilitated by the service. In contrast, a user whom fails to realize his or want from using the M-pesa service is likely to discontinue use of the service because he or she is likely to have a negative attitude towards the service. Thus satisfaction serves as an instrument to engender user continuance with a service. This assertion of an association between satisfaction and continuance has also been validated in the extant literature (e.g., Bhattacherjee, 2001a; Kim et al. 2009; Liu et al. 2011; Kuo et al., 2009; Bhattacherjee & Lin, 2014). Thus, this study's eighteenth hypothesis:

H18- *A users high-level of satisfaction with M-pesa is positively associated with his or her continuance intention towards M-pesa.*

Users of technology-enabled services are not only pragmatically oriented but also appreciate a pleasurable experience (Kim et al. 2007). Flow characterizes a choice partcipation where a user's ability and the tasks surpass the verge level and attains a fit (Finneran and Zhang, 2005). Where a user's skills constantly surpass the tasks, boredom arises (Hoffman & Novak, 1996). Conversely, where the tasks prevail over the skills of a user, then the user feels nervous (Zhou, 2013). When skills and tasks are below the threshold values, users feel indifferent (Csikszentmihalyi, 1997). In using M-pesa, a user needs to possess fundamental understanding and dexterity of mobile internet and electronic payment. This is because a user could encounter issues like operation snags and

concerns on payment safety, which is a perturbing unlike usage of other kinds of mobile services that don't involve cash transactions (Zhou, 2013). Users need to create parity between skills and challenges to achieve a flawless process, captivating and pleasurable experience. When a user of M-pesa experiences flow during use, he or she would have enjoyed it and will be inclined to re-live the experience (Zhou, 2013). A yearn to relive the experience influences a user's continuance intention. Thus, a user of M-pesa who realizes an optimal experience of flow during use of the service is likely to continue using the service to accomplish their target task. Lastly, flow has been reported to influence behavioural intentions (continuance) in the extant studies (e.g., Richard & Chandra, 2005; Luna, Perrachio, & de Juan, 2003; Zhou, 2013). Thus, this study's nineteenth hypothesis:

H19- *A users high-level of flow with M-pesa is positively associated with his or her continuance intention towards M-pesa.*

Trust characterizes an individual's inclination to be susceptible based on positive beliefs of a second party's imminent behaviour (Gefen et al. 2003). That said, mobile technology-enabled services are built on a significant level of uncertainty and risk (Zhou, 2013). On account of, anonymity, virtuality, chronological and geographical partition, developing user trust is vital for the advancement of mobile-enabled services (Liu et al. 2010). When users utilize M-pesa for transactions, they deposit their money with strangers (M-pesa agents) endorsed by the M-pesa vendor. Given the sensitivity of cash, a users willingness to deposit his or her cash with an M-pesa agent is simply due to trust; the key element in the preservation of exchange relations (Blau, 1964). Void of trust, the M-pesa user has no guarantee that the vendor would act as expected in the exchange relationship, and this is a risk to the financial security of the user. Therefore, trust between users and mobile service vendors must be developed to ease adverse occurences (Fogel and Nehmad, 2009). Trust, through the lens of user belief, usually comprises trio facets: ability, integrity, and benevolence (Gefen et al. 2003). Ability demonstrates that the vendor has the required capacity and gen to discharge their responsibilities. Integrity characterizes a vendor's ability to fulfil promises and not swindle users. Benevolence denotes that the vendor will justly treat user interests and as well as their gains. When an M-pesa user is convinced that the service is worthy of performing to a standard that has been agreed upon, the user is unlikely to cease patronage, as the service facilitates the accomplishment of his or her target task. Thus, unless a vendor is able to alleviate a user's perception of uncertainty and risk, the user is unlikely to continue using the service. Concurring with this view, studies on trust in mobile technology-

enabled product (e.g., Benamati et al. 2010; Luo, Li, Zhang, & Shim, 2010; Zhou, 2013) report that trust is a significant influencer of use behaviour. Thus this study's twentieth hypothesis:

H20- *A users high-level of trust in M-pesa is positively associated with his or her continuance intention towards M-pesa.*

3.4.3 Control Variables

Control variables are included in this study to provide supplementary knowledge in interpreting the data collected. They enable the researcher deduce patterns that emerge on demographic basis (Brace, Kemp, & Snelgar, 2006). In this study, four control variables are selected (age, gender, income, and education). These selections are supported in their contribution to individual user differences on behavioural intention towards technology use (Nui Polatoglu & Ekin, 2001; Venkatesh & Morris, 2000; Venkatesh et al. 2003; Lee, Lee, & Eastwood, 2003). A brief rationale for selection of each control variable is presented next.

3.4.3.1 Age

Age is reported in the extant literature to influence technology use differently amongst older and younger individuals.' To exemplify this statement, Venkatesh & Morris (2000) and Venkatesh et al. (2003) find that, for younger individuals', attitude is a driver of their technology use. The authors further report that older persons are greater influenced by perceived behavioural control and subjective norms. Based on this findings, and that the aforementioned studies were conducted in developed regions, the researcher seeks to assess the generalizability of this finding amongst technology users in a developing region. Other extant studies to support the assertion of age's influence in technology use include: (Rogers, 1995; Tellis, Prabhu, & Chandy. 2009).

3.4.3.2 Gender

Scholars such as Gefen & Straub (1997), Venkatesh & Morris (2000), and Venkatesh et al. (2003), have investigated the differences in attitudes and perceptions of gender towards technology use. An interesting finding by Venkatesh & Morris (2000) and Venkatesh et al. (2003) is that perceived usefulness of a technology is a stronger influencer for young males than females, towards technology use. The authors further explain that males often use technology for its

capacity to facilitate their task requirements, while females use it possibly for their stronger social and networking needs. In this study, it would be interesting to assess the differences in perceptions of the adopted factors across gender. This assessment will support or refute further generalizations that may be made of genders influence towards technology use. Other extant studies to support the influence of gender in technology use include: (Rogers, 1995; Goldsmith, Freiden, & Eastman, 1995; Ha & Stoel, 2004).

3.4.3.3 Income

Prior research conducted by Pew Internet & American Life Project (2010) asserts that individuals of low-income earning are unlikely to use technology-enabled services. Income levels indicate ones socio-economic status, and has demonstrated a significant power in distinguishing use or non-use of a technology (Jung, Qui, & Kim, 2001; Lenhart, 2002). Expounding on this, Chabossou, Stork, Stork, & Zahonogo (2008) analyse factors that influence the likelihood of an individual's use of a technology, and these authors find that income enhances mobile technology use and that people would increasingly adopt mobile technology should their income increase. In this study, the researcher includes income as a control variable to identify the income brackets of survey participants who have reported their intention to continue using M-pesa. This will be of value to mobile money service providers in developing strategies to attract consumers from different income brackets to use their services. Extant studies that posit an influence of income in technology use include: (Rogers, 1995; Tellis et al. 2009).

3.4.3.4 Education

The use of technology-enabled services is often low amongst individuals with less education because they may lack knowledge and skills on the operational functions of the given device (Deursen, Van Dijk, & Peters, 2011, p.129). Further, acceptance and use of a technology often involves new learning, and learning is determined by distinctions in psychical abilities (Beier & Ackerman, 2005). Thus, because technology use requires individuals to acquire new ways of performing tasks and new procedural knowledge, it is likely that those people whom have formal understanding of the knowledge acquisition process would be more adept at knowledge acquisition of technology use. Extant studies to validate the findings of educations influence on technology use include: (Rogers, 1995; Van den Bulte, 2000; and Tellis et al. 2009).

3.5 Conclusion

In this chapter, the researcher adopted established guidelines within the literature for a theoretical model development and outlined the applied execution. Subsequently, he gave an overview of the base model (PAM) for investigations of user continuance with technology-enabled services. To complement the PAM's shortcomings, the researcher sought complementary factors to improve the predictive power of the model. As such, he outlined the adopted steps in selecting potential complementary antecedents and determinants of user continuance intention towards M-pesa. In selecting complementary factors, the researcher noted adopted parochial approaches to filter through extant studies; this approach helped set the boundaries for selection of potential antecedents and determinants of continuance intention. Thereafter, the selected complementary factors were discussed through the lens of their respective model or theoretical underpinnings. Next, application of the selected factors and their roles in explaining user continuance intention were presented. Then, the causal logic for the adopted variables, a conceptual model and hypotheses were presented.

The next chapter discusses the research methodology for the study.

4. RESEARCH METHODOLOGY

*"Research methods shape the language we use to describe the world, and language shapes how we think about the world" (**Benbasat & Weber, 1996, p.392**).*

The previous chapter discussed the theoretical underpinnings, model development, and hypotheses of the study. In this chapter, the researcher details the research design and presents the strategy for the study. In particular, ontological, epistemological, and methodological perspectives are presented. Thereafter, an overview of research settings and data collection procedures, data collection sites, measurement instrument, and data analyses techniques are discussed.

4.1 Research Design Strategy

Research design strategy aids in the planning and structuring of a research study that maximizes the validity and reliability of research findings (Blanche, Durrheim, & Painter, 2006). Thus, research strategy determines how empirical data are collected and analysed (Yin, 1994), and draws a common plan for the research; outlining its procession in fulfilling its purpose (Saunders, Lewis, & Thornhill, 2000). In preparing a research strategy, it is imperative to recognize that diverse styles of research permit researchers to realize divergent phenomena and for different reasons (Deetz, 1996). The selected methodology should be reliant on the researcher's goal rather than a preference of paradigm (Cavaye, 1996; Weber, 2004). Last, a selected methodology must provide answers to the posed RQ's. The processes applied towards ensuring validity and reliability of this study is discussed next.

4.1.1 Ontological Considerations

"I think that, among contemporary cynics, the use of the word "mystery" is almost a fright word. To admit that there is any mystery about the universe's existence is to suggest that there is, ultimately, something incomprehensible and unsolvable about it (something that cannot be reduced to a function or a problem), and this is a "no-no."~ **Albert Einstein.**

Ontology originates from historical philosophy examining the nature of reality (Guarino, 1995, p.626). Abstractly, ontology is concerned with what kind of things exists and what entities are contained in the universe (Guarino, 1998, p.2; Mylopoulous, 1998, p.136). Mindful that ontology has a focus on the real world, it is appropriate to apply it to studies on information systems

(technology-based services). Particularly because such services are real-world systems, ontology may aid in identifying essential concept to be modelled about them (Wand & Weber, 1989). That said, there are two competing ontological views in IS research and these are: the realist and relativist views. These views as posited by Fitzgerald and Howcroft (1998) are illustrated in table 4.1, and subsequently discussed.

Table 4.1 Ontological views (Fitzgerald & Howcroft, 1998, p.323)

Realist	Relativist
A realist scholar believes that the external world is made up of pre-existing tangible structures with an independent existence of an individual's cognition (Fitzgerald & Howcroft, 1998, p.323).	A relativist scholar believes that a variation in reality is a subjective construction of the mind. Further, he or she believes that socially transmitted terms influence our perception of reality, which varies across languages and cultures (Fitzgerald & Howcroft, 1998, p.323).

4.1.1.2 The researcher's exposition of Realism vs Relativism

The realist considers the external world as granted; the existence of the external world is independent of thought or experience (Healy & Perry, 2000), and that it is possible for science to realize cognitive knowledge of this reality (Quale, 2007, p.235). It is a world we find ourselves implanted and which we reside in. We are able to alter the world by our actions which initiate change. For instance, we construct roads, plant and nurture crops, degrade our environment through man made pollution, etc. However, we did not create the world, the entities which comprise the world, the laws of nature which rule the conduct of contained entities. Therefore, above human ideology or knowledge as a principal informant of our view of reality, the realist considers human ideology to form a rather insignificant part of that reality. Conversely, relativists believe that all viewpoints are equally legitimate and that all truth is relative to an individual (Jackson, 2015); it is not cognitively meaningful to speak of an objective reality. The common theme holds that some central aspect of experience, thought, evaluation, or even reality is someway relative to something else. Exemplary, standards of rationalization, ethical opinions or truth are considered relative to words, customs, or genetic forms. In essence, diversity, not consensus, is the central fact of life (Fitzgerald & Howcroft, 1998). Therefore, the relativist view is critical of the usefulness of the concept of pre-existing tangible structures as a standard for defining reality.

4.1.1.3 The Researcher's Ontological Stance

The relativist view is an inappropriate ontology for this study because it holds a solipsistic observation of reality. Burns (2000) opines that scientific studies are empirical and *objective*, thus a subjective approach cannot answer scientific RQs, like those posed in this study: (i) what are the antecedents of user continuance intention towards M-pesa, and (ii) what are the determinants of user continuance intention towards M-pesa? Techniques of the relativist are not designed to answer experimental questions (Burns, 2000; Gigerenzer, 2014, p.321). For illustrative purposes, Quale (2007, p.242) writes that: given a relativist's view that knowledge is created by the individual knower, and exists in his or her mind: it will be problematic to assess the individual's knowledge that there is anyone out there, with whom he or she can connect and share knowledge with. In essence, how would the individual know that there is a world external of them? A relativist can therefore not negate the likelihood that he or she is living a fantasy.

In this study, the researcher concedes to a lack of inherent knowledge surrounding user continuance intention towards M-pesa and therefore seeks scientific methods to discover knowledge of the M-pesa continuance phenomenon. As such, an objective approach to studying user continuance intention is imperative because: first, objectivity is the prerequisite of scientific discovery. Second, an objective approach reduces biased interpretations of the results because investigation protocols are documented, and data and methodology are accessible for scrutiny by other scientists; thus enabling other researchers the opportunity to validate results by attempting to reproduce them.

In this vein, from a realist perspective, there exists only one true reality. To capture and correctly present this single reality, it is argued that the researcher must remain objective (Hammersley, 2000). Objectively, within the consumer behaviour context, utility[35] is considered the goal of a consumer and a profit enabler for a vendor. In a continuance context, explicating utility, the base model posited by Bhattacherjee (2001a) focuses on the *motivations* for user continuance with technology that emerges in the IS post adoption era. Motivation is fundamental to consumer cognition and behaviour because it is the impellent within an individual that directs him or her

[35] Utility is the desire or contentment that an individual gains from the consumption of goods and services (Wang & Zhang, 2011).

towards a given action (Evan, Jamal, & Foxall, 2009). Prerequisites to actions are decision-making, which is a multi-stage process (Bettman, 1979; De Bruyn & Lilien, 2008). Afore-noted in chapter 3, the PAM is an adaptation of the ECT, and follows similar flow processes in decision-making. The causal flow goes: (i) a user's contact with information about a product or service performance features leads to the realization of product or service specific expectations of the consumer (Olson & Dover, 1979) (ii) a rational comparison between expectations and real experiences leads to a subjective assessment of disconfirmation (Oliver et al. 1994), and (iii) a composite of expectations and disconfirmation regulates the satisfaction level, that in turn, influences repurchase intentions. For user continuance with M-pesa, the consumer behaviour literature presents an individual's utilization of any product or service as a rational choice[36] (Bartels & Johnson, 2015). Goals, options and constraints set the boundaries for rational choices (Hantula & Wells, 2014). Rationality here implies resolute, where an individual acts reasonably: sets goals and makes a logical effort to achieve them, given available alternatives and constraints. That said, this study treats users of M-pesa as rational, and their decision making as one of rationality; consumers make decisions after collecting information and weighing all alternatives.

Mindful of the above discussion, the study lends itself to a realist perspective which professes that the world consists of structures independent of an individual's cognition; human behaviour is passive, controlled and determined by the external environment. Within this sphere, observation and reason are the preeminent means of comprehending human behaviour, in that true knowledge is dependent on experiences of senses and is obtained by observation and experiment. This ontological view suits the research goals of this study which is to model and test determinants (quantifiable measures) of user continuance intention towards M-pesa. Measures are quantified, in that: their selection is drawn from literature that presents precise measurement and analysis of target concepts that are posited to influence human behaviour towards technology. The RQ's (antecedents and determinants) allude to testing of factors which *decisively* affect continuance intention towards M-pesa. Thus, responses to these questions requires that the researcher pursues objectivity because this will eliminate results dependent on the researcher's beliefs and will provide scientific documented protocols to enable replication and validation of the findings. Also, it will enable results reported on exact levels of significance. The employment of a self-

[36] Decisive selection directed analytically towards the realization of goals given options and constraint of the situation (Ostrom, 1998).

administered survey instrument is part-strategy to eliminate the researcher's bias and to enable survey participants' to respond to the questions put to them without the intervention of the researcher or his assistants during the survey administration phase. This approach allows to a degree, time and context free generalizations to be made about responses (Nagel, 1986).

4.1.2 Epistemological Considerations

"Epistemology is the study of knowledge. By what conduit do we know what we know"~ Theodore Bikel.

Epistemology is inquiry into nature, origin, and the boundary of human knowledge (Becker & Niehaves, 2007). Essentially, it is the study of human method of acquiring knowledge, and answers the question: 'how do we know?' According to Fitzgerald and Howcroft (1998), there are four competing epistemological views that classify knowledge types and these are: positivist, interpretivist, objectivist, and subjectivist. These views are outlined below in table 4.2, and discussed. Additionally, scholars (e.g., Guba & Lincoln, 1994) argue supplementary views such as critical theory and post-positivism. These views are also discussed next.

Table 4.2 Epistemological Views (Fitzgerald & Howcroft, 1998)

EPISTEMOLOGICAL VIEWS	
The Positivist holds that: (i) The world conforms to established laws of causation. (ii) Complexity can be handled by reductionism. (iii) Attention should be paid to objectivity, measurement, and repeatability.	The Interpretivist holds that: (i) There is no universal truth (ii) An understanding and interpretation from a researcher's frame of reference is an effective approach to research. (iii) Uncommitted neutrality is unattainable. (iv) Realism of context is essential.
The Objectivist holds that: (i) It is possible and vital that a researcher stays detached from the research context. (ii) Neutral observation is attained only when a researcher's values and bias are secluded from the object of investigation.	The Subjectivist holds that: (i) There is no distinction between the researcher and research situation. (ii) Research results are a product of the interactions between the researcher and the research situation (iii) A researcher's values and beliefs are central mediators.

4.1.2.1 Positivist and Objectivist

The positivist and objectivist views are discussed jointly in this section because there are overlaps between their views. The positivist doctrine is based on philosophical beliefs of the French philosopher: Auguste Comte[37], and guides researchers to adopt a realist ontology that professes:

[37] Auguste Comte is the founder of the doctrine of positivism (Pickering, 1996)

"the external world consists of pre-existing hard tangible structures which exist independently of an individual's cognition" (Fitzgerald & Howcraft, 1998, p.323). Positivism is a product of the natural sciences, portrayed by the testing of hypotheses formulated from extant theories to measure social reality. The positivist believes that a scientific approach towards the advancement of knowledge ensures validity, confidence, and precision (Crotty, 1998 p.29). Said differently, the positivist paradigm is premised on repeatability, reductionism and reliability (Pather & Remenyi, 2004). Further, the positivist reckons, consistent with the realist ontology, that the researcher and the researched are sovereign (Lincoln & Guba, 2000a). This links to the objectivist standpoint: the researcher and the phenomena under investigation must be autonomous whereby the researcher remains neutral (Fitzgerald & Howcroft, 1998). Any interference during investigations could threaten the scientific validity of the results. Additionally, propositions must be logically true or empirically testable (Landry & Banville, 1992). Therefore, the focus of the *positivist* is on explanation associated with prediction and then control of the researched phenomenon (Orlikowski & Baroudi, 1991), and the *realist* on value free and explicit interpretation of reality (Guba & Lincoln, 1994).

4.1.2.2 Interpretivist and Subjectivist

Likewise the positivist and objectivist view, the interpretivist and subjectivist views are intertwined. These views complement each other as they both hold that the researcher and the researched are not sovereign. The interpretivist researcher subscribes to the relativist ontology, professing that: "multiple realities exist as subjective constructions of the mind, where socially-transmitted terms direct how reality is perceived and this will vary across different languages and cultures" (Fitzgerald & Howcraft, 1998, p.325). As such, the interpretivist concept is informed by a concern to identify with the world as it is, comprehend the primary nature of the social world at the level of *subjective* experience, and seek explanation within the boundaries of individual perception and *subjectivity* (Burrell & Morgan, 1979, p.28). In essence, scholars whom identify with this paradigm argue that reality can only be understood by *subjective* analysis of a phenomenon and intervention in reality (Klein & Myers, 1999). The interpretivist paradigm therefore seeks enlightenment through the connotations that individuals enact to them (Boland, 1985; Orlikowski & Baroudi, 1991; Deetz, 1996). Last, the interpretivist paradigm supports *subjective* descriptions and understanding, above the explanation and prediction goals linked with positivist research (Nissen, 1985).

4.1.2.3 Critical Theory

Conceptually, critical theory was built on the foundation of Marxism, by scholars who believed that traditional Marxism would not be an applicable theory for modern society to address its complex social and economic structures (Willis, 2007). The critical theory paradigm holds an ontological view that emphasizes a pensive assessment and critique of society and culture through the lens of social sciences and humanities (Sim & Van Loon, 2001). In essence, this is a reality that is created and profiled by social, economic, political, and cultural factors that have been fashioned eventually (Guba & Lincoln, 1994). As such, a critical theorist believes in a single reality that is shaped in time by social drivers. Further, Guba and Lincoln (1994) opine that the critical theorists are a closer fit with the subjectivist epistemology, in that; the researcher and inquiry are not sovereign. Methodological protocols adopted by critical theorists are often engagement methods such as: conversations and reflections to contend assumptions. In précis, Giroux, (1988, p.213) writes that the goal of engagement between the researcher and research participants' is to identify various forms of past and dominated knowledge that reference experiences of affliction, divergence, and collective struggle, and to relate the idea of past understanding to essentials of critique and optimism. Thus, the goal of the critical theorist is to evaluate, alter, and liberate the social reality under scrutiny (Orlikowski & Baroudi, 1991; Hirschheim & Klein, 1994; Klein & Myers, 1999; Myers & Klein, 2011). For this study, critical theory is not a fit because the study aims to quantify user perception towards M-pesa, rather than alter and change the research subjects' worldview or critique society in view of experiences and ideas of past understanding.

4.1.2.4 Post-Positivism

The disparity between positivism and interpretivism has been largely debated (Fitzgerald & Howcroft, 1998). In attempt to reconcile differences between these paradigms, Hirschheim (1985) proposes a post-positivism paradigm. Post-positivism presents a slightly modified ontological view to the realist and terms it 'critical realism.' The critical realism ontology claims to ascend the raw realism held by the positivist scholars, and rather posits that reality can be accepted only defectively and prospectively (Lincoln & Guba, 2000b, p.168). In essence, discoveries are identified by the researcher's sentiments and acuity which dispels the grasp of a pure reality (Teddlie & Tashakkori, 2009).

The post-positivist doctrine promotes methodological pluralism, implying that a single method of science is erroneous; rather multiple methods strengthen our findings (Wildemuth, 1993). Chen and Hirschheim (2004) concur with the view that pluralism fosters the body of knowledge; engaging substitute approaches for research strengthens or refines extant knowledge, an essential for development within the IS discipline. Post-positivism, although a commendable paradigm for its claim to reduce errors in findings, the researcher grapples with positivistic instinct to criticize the vagueness of language (i.e., defectively and prospectively) that conjoins paradigms, beliefs, and disciplines (Biersteker. 1989). In essence, concurring with Biersteker (1989) and by no intent a whippersnapper, the researcher holds cynicism about scholarship that professes indistinct criteria for selection amongst the various and sometimes conflicting explanations it yields, and believes that post-positivism is an irresolute approach to answering the conclusive based RQ's posed in this study.

4.1.2.5 The Researcher's Epistemological Stance

"Understanding in terms of cause and effect was an a priori characteristic of the human mind underlying all human knowledge." ~ **(Gregor, 2006, p.617 citing Kant 1781)**

4.1.2.5.1 Discharged Views

The interpretivist, subjectivist, critical theorist, and post-positivist views are discharged as perspectives from this study because they do not maintain a clear distinction between science, personal experience, and fact and value judgement.

Interpretivist and subjectivist approaches attempt to understand a phenomenon based on *relativity*; *research subjects assigned meaning to them* (Orlikowski & Baroudi, 1991; Deetz, 1996), critical theorists seek to *assess*, *modify*, and *liberate* the social reality under scrutiny (Orlikowski & Baroudi, 1991), and post-positivist make discoveries through the *researcher's view* and *perception* (Teddlie & Tashakkori, 2009), and do not *generalize causes and effect* (Neuman, 2000; Hudson & Ozanne, 1988). Collectively, these views favour descriptions and understanding over the explanation and prediction goals associated with positivist research (Nissen, 1985). Views of these natures cannot concisely answer the cause and effect/conclusive based questions posed in this study:

(i) What are the antecedents of user continuance intention towards M-pesa?

(ii) What are the determinants of user continuance intention towards M-pesa?

To answer the afore-noted questions, the positivist view seems appropriate because it holds that the world of phenomena has an objective reality that may be reported in causal relationships and measured in data, in a reportable and accurate manner (Kaplan & Duchon, 1988; Straub, Boudreau, & Gefen, 2004). Essentially, causality or conclusive-based questions like the abovementioned can be investigated within an objective reality to enable the researcher report underlying associations, determine the associations in data in an accountable and truthful manner. Elaboration on this view is presented next.

4.1.2.5.2 Selected View

In light of earlier discussions of overlaps between positivist and objectivist views in *section 4.1.2.1*, the researcher submits to the concept of an objective reality, and specifies that the epistemological viewpoint is positivist. It is thus viewed as the researcher's investigation of the underlying laws of causation of a user's continuance intention towards M-pesa. Aforesaid, the positivist paradigm applies a systematic, scientific approach to research, with a worldview of established laws of causation; everything that occurs around us can be explained by knowledge of the underlying universal laws (Fitzgerald & Howcroft, 1998). The goal of this study is to answer the RQ's: (i) what are the antecedents of user continuance intention towards M-pesa, (ii) what are the determinants of user continuance intention towards M-pesa. To answer these questions, positivism holds that there are universal laws governing continuance intention, and to understand these universal laws, the researcher needs to observe and document events of the phenomena around the research setting in a systematic way and then work out the underlying principle that causes users to continue use of M-pesa. This approach aligns with Kant's (1781) view that the world of phenomena has an objective reality, which can be conveyed in causal relationships and measured in data in a representative and precise method (Kaplan & Duchon, 1988; Straub et al. 2004). The core of a positivist research is to uncover the objective physical and social reality by modelling specific measures that will identify the dimensions of reality sought by the researcher (Orlikowski & Baroudi, 1991). A priori fixed relationships within a given phenomenon are often examined with structured instruments to validate theory, and this helps to advance predictive knowledge of a phenomenon (Orlikowski & Baroudi, 1991). The positivist doctrine asserts that a given phenomenon is structured and exhibits constancy, and thus, the researcher's goal is to identify the patterns and consistencies, and then report them in form of causation (Cecez-

Kecmanovic, 2005). As such, causal laws are instructive in the control and prediction of technology use, user behaviour and attitudes towards a technology (Cecez-Kecmanovic, 2005).

4.1.2.5.3 Application of Selected View

Consistent with the above discussions, to convey the phenomenon of user continuance intention towards M-pesa in causal relationships, the researcher has identified suggested antecedents and determinants within the extant literature on consumer behaviour, computing behaviour, and psychology. The suggested factors have been adopted and modelled for statistical tests. Specific measures (constructs) to identify the dimensions of reality have been adopted from the extant studies, and data will be collected from users of M-pesa with survey instruments containing items measured on a likert scale. Thereafter, to examine a priori fixed relationships, quantitative methods of multivariate data are employed to assess survey participants' responses. The results will aid the researcher in revealing the patterns and consistencies of user continuance intention towards M-pesa in a reported form of causation.

In sum, given this study's goal to identify the underlying causal relationships that can predict user continuance intention towards M-pesa, and that the study has constructed an empirically testable model to determine causal relationships amongst the study's predictor variables (perceived TTF, post-usage usefulness, confirmation, system quality, information quality, and service quality, utilization, satisfaction, flow, and trust, utilization, satisfaction, and trust), and the criterion variable (continuance intention), the characteristics of the positivist approach is the most appropriate for the execution of the study.

4.1.3 Selected Methodology

To ensure validity and reliability of a study, it is imperative to properly plan and structure the research (Blanche et al. 2006). This involves identifying the most appropriate methodology that tackles the research problem and is most likely to lead to a purposeful end (Ghauri & Gronhaug, 2005). The past three decades have witnessed the employment of several scientific philosophies in the IS research domain, and for each philosophical paradigm, there are commonly used methodologies (i.e., quantitative and qualitative).

Quantitative methods are often employed where a researcher proposes a positivistic approach to investigating a phenomenon. The researcher's philosophical view in this case is based on the

assumption that the world of phenomena has an objective reality that may be reported in causal relationships and measured in data, in a reportable and accurate manner (Kaplan & Duchon, 1988; Straub et al. 2004). Conversely, qualitative methods are commonly used where a researcher proposes an interpretivist approach to investigating a phenomenon. Here, the researcher's philosophical view is that knowledge of the world is intentionally constituted through a person's lived experience and that the researcher and reality are inseparable (Walsham 1993; Cecez-Kecmanovic 2005). In light of the ontological and epistemological discussions, the researcher posits that the nature of the study requires the adoption of a quantitative approach [38]to answer the study's RQ's: (i) what are the antecedents of user continuance intention towards M-pesa? (ii) What are the determinants of user continuance intention towards M-pesa? In accordance, Orlikowski and Baroudi, (1991) assert that where a study seeks to discover the objective physical and social reality of a phenomenon (e.g., user continuance intention towards M-pesa), identifying and operationalizing precise measures that will predict the dimensions of reality underpinning this research occurrence is appropriate.

In sum, through the positivist lens, there is a single tangible reality in the world awaiting discovery and can be presented in causal relationships. Consistent with this view: this study has identified appropriate models and theories in the extant literature that have quantifiable measures of variables, modelled suggested determinants in the extant literature of user continuance intention towards M-pesa, formulated testable hypotheses, seeks to collect data collect from a sizeable number of survey participants, make statistical inference[39]about user continuance intention towards M-pesa, and thereafter generalize inferences from the surveyed sample about user continuance intention to part of the Kenyan population.

4.2 Data Collection

An important aspect of quantitative based studies is the data collection phase, and it is concerned with, to name a few; the selection of factors and means to communicate with respondents,

[38] Note: While a quantitative approach is selected to answer the study's RQs, a supplementary open-ended question was included in the survey instrument and will require simple qualitative analysis- thematic.
[39]Statistical inference enables a researcher deduce the probability of the study's results for the sample size that could have been obtained by chance (Saunders, Lewis, &Thornhill, 2009).

sampling, analysis, time-frames, budget constraints, etc. The methods employed in this study are discussed next.

4.2.1 Data Collection Method

Several methods are available to a quantitative researcher for data collection. Nonetheless, a customary method employed in most quantitative studies is the use of a survey instrument (Sivo, Saunders, Chang, & Jiang, 2006), and it is usually administered online or paper based. Survey method is often utilized when a researcher seeks to collect data on a phenomenon that requires clarity. Further, data is typically collected with the use of questionnaires containing close-ended questions. In this study, the relevant constructs were adopted from extant literature on psychology (flow and trust), and IS (perceived task-technology fit, utilization, post-usage usefulness, confirmation, satisfaction, system quality, information quality, service quality, and continuance intention). The selection of constructs from multi-disciplinary perspectives is an endeavour to extend continuance theory. An integration of constructs from the aforesaid disciplines constitutes the survey instrument that was developed and administered to users of M-pesa service in Kenya.

4.2.1.1 Instrument Development

To ensure validity of a research study, it is instructive to draw from prior validated instruments in the extant literature (Bailey, 1982; Straub et al. 2004). In this vein, this study adopts and operationalizes scales from extant studies that have reported high validity scores. The adopted constructs from the extant literature are presented in table 4.3.

Table 4.3 – Adapted constructs for the study

Constructs	Description of Construct	Construct Category	Hypotheses	Supporting Literature	No. Of Scale Items
Perceived Technology Task Fit	A user's perception of a match between the capabilities of M-pesa and his or her target transaction task.	Predictor Variable	H1	Larsen et al. (2009).	3

Post-Usage Usefulness	A user's aggregated perception of the usefulness of M-pesa since initial use.	Predictor Variable	H2	Bhattacherjee et al. (2008).	3
Confirmation	Post-use, a self-reported fulfilment of a user's expectation of M-pesa.	Predictor Variable	H3	Bhattacherjee, 2001a; Larsen et al. (2009).	3
System Quality	A user's perception of the access speed, ease of use, navigation, and visual appeal of M-pesa service.	Predictor Variable	H4	DeLone & McLean (1992); Zhou (2013).	3
Information Quality	A user's perception of the information relevance, accuracy, and timeliness provided by M-pesa.	Predictor Variable	H5	Delone& McLean (1992); Zhou (2013).	3
Service Quality	A user's perception of the reliability, responsiveness, and personalization, of M-pesa service.	Predictor Variable	H6 , H11, H12	DeLone& McLean (2004); Zhou (2013).	3
Utilization	A user's operation(s) of M-pesa for transactional activities.	Predictor Variable	H7, H13, H16	Larsen et al. (2009); Junglas, Abraham, & Ives (2009).	3
Satisfaction	A user's summative feelings that are developed following several uses of M-pesa.	Predictor Variable	H8, H17	Bhattacherjee, et al. (2008); Zhou (2013).	3
Flow	A user's mental state of operation whilst using M-pesa.	Predictor Variable	H9, H15, H19	Zhou (2013)	4
Trust	A user's willingness to be vulnerable based on positive	Predictor Variable	H10, H14, H18	Zhou (2013)	3

	expectation towards the M-pesa vendor.				
Continuance Intention	A user's self-reported intention to continue using M-pesa for transactions despite alternatives	Criterion Variable		Bhattacherjee (2001a); Bhattacherjee et al. (2008).	4

4.2.2 Measures of Validity and Reliability of Survey Instrument

Validity is assessed in a spectrum, and these include; content, face, construct, convergent, and discriminant. These forms of validity are discussed next.

4.2.2.1 Validity and Reliability of study

Validity is concerned with the extent to which the data collected actually measures the intended phenomenon (Leedy & Ormrod, 2001). Employing measures to ensure instrument validity is an imperative phase of conducting a meticulous study in the IS domain (Gefen & Straub, 2005; Straub et al. 2004). Instrument validity is of high contemporary importance because data captured with instruments that lack rigour would threaten the scientific basis of the profession (Straub et al. 2004). A researcher therefore has a duty to ensure integrity of the instrument that captures required data for his or her investigation. The validation measures employed in this study are discussed in the subsequent section. Conversely, reliability focuses on the regularity of the research model in use (Leedy & Ormrod, 2001). It can be established through the use of multiple items to reflect each underlying construct and to statistically conclude on the internal consistency of responses to each item (Hair, Anderson, Tatham, & Black, 1998; Allen & Yen, 2002). Measures taken to ensure reliability in this study are also discussed in the next section.

4.2.2.1.1 Content Validity

Content validity focuses on the extent to which items in a survey instrument measure their intended target, according to their conceptual definition (Rogers, 1995; Hair, Black, Babin, & Anderson, 2014a). This form of validity is attained based on literature reviews or expert opinion

(Boudreau, Gefen, & Straub, 2001; Straub, 1989). To ensure content validity in this study, a review (pre-test[40]) of the survey instrument was conducted within the University of Cape Town's-IS department. Three professors and three doctoral associates participated in the review. These individuals' were selected based on their involvement in authoring prior related studies that are similar to the present study's context. Additionally, they have served as journal reviewers, presented conference papers, and published on the topic of consumer use of technology-based services. Thus, their feedback aided in ascertaining the extent to which the study's measures were appropriate for the objective of the study.

4.2.2.1.2 Face Validity

This form of validity ascertains whether the instrument captures data about its intended target (Eachus, 1999), thus an important point of protocol for the data collection phase of research (Hair et al. 2014a). To confirm the presence of face validity, a pilot-test was conducted in the city centre of Nairobi, also known as Nairobi central business district. The location was selected because it is a central business area within the city, has a several (approximately. 359[41]) M-pesa agent stores within its vicinity, and was thus likely to enable easy access to present users of M-pesa. The pilot study therefore ensured that the participants understood the instructions given to complete the questionnaire, could adequately interpret the items and answer the questions, were able to respond to scale items, and that actual response time was within range of the estimated 10-15 minutes required to complete the questionnaire.

For the pilot study, responses from 30 individuals' were collected. This allowed for a preliminary statistical analysis to infer the likely proportion for the main survey (Saunders et al. 2009). For example, to determine the variance in responses; which helped identify potential issues that required rectification prior to the actual data collection phase of the study. The time frame required to complete the number of questions in the survey was assessed and determined. Following the pilot study, revisions to item wording were made to improve clarity, and the length of time required to complete the survey was estimated to be 10 minutes. The revisions made to the survey instrument are presented in table 4.4.

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[40]The basis for conducting a pre-test is to realize how the data collection protocols and survey instrument work in a simulated environment (Fowler, 1993, p.100.)

[41] http://www.safaricom.co.ke/personal/m-pesa/m-pesa-agents/agent-locations-pdfs

Table 4.4 Revisions to survey items

Item Source	Operationalized item	Rephrased item post-pilot study
Task Technology Fit TTF (Larsen et al. 2009; Goodhue & Thompson, 1995)	1. In enabling me send money, the functions of M-pesa are appropriate	1. The money transfer deposit function of M-pesa allows me to send money.
	2. In enabling me receive money, the functions of M-pesa are appropriate	2. The money withdrawal function of M-pesa allows me to receive money.
	3. In general, the functions of M-pesa fully meet my money transaction needs	3. In general, the deposit (send money) and withdrawal (receive money) functions of M-pesa fully meet my money transfer needs.
Post-Usage Usefulness PUU (Bhattacherjee et al. 2008)	1. Using M-pesa for sending money increases my productivity (e.g., makes sending money faster)	1.Over the year(s), I find that using M-pesa for sending money increases my productivity (e.g., makes sending money faster, efficient, and cost effective)
	2. Using M-pesa for receiving money increases my productivity (e.g., makes receiving money faster)	2.Over the year(s), I find that using M-pesa for receiving money increases my productivity (e.g., makes receiving money faster, efficient, and cost effective)
	3. Using M-pesa for sending money improves my money transfer performance (e.g., makes sending money safer)	3. Over the year(s), I find that using M-pesa meets my monetary transaction needs.
	4. Using M-pesa for receiving money improves my money transafer performance (e.g., makes receiving money safer)	
Confirmation (Bhattacherjee et al. 2008; Larsen et al. 2009)	1. My experience with using M-pesa was better than what I expected before using it	1. My experience using M-pesa was better than what I expected before using it.
	2. The service level provided by M-pesa was better than what I expected before using it	2. The service(s) provided by M-pesa is better than what I expected before using it.
	3. Overall, most of my expectations from using M-pesa were confirmed	3. Overall, most of my expectations from using M-pesa were met.
System Quality (DeLone & Mclean, 1992; Zhou, 2013).	1. M-pesa quickly loads all the text and graphics	1.M-pesa quickly loads all text and images
	2. M-pesa is easy to use	2.M-pesa is easy to use
	3. M-pesa is easy to navigate	3.M-pesa is easy to navigate
Information Quality (DeLone& Mclean, 1992; Zhou, 2013).	1. M-pesa provides me with information relevant to my transaction needs	1. M-pesa provides me with relevant information for/about my transactions.

	2. M-pesa provides me with accurate transaction information	2. M-pesa provides me with accurate transaction information (e.g., account balance)
	3. M-pesa provides me with up-to-date information.	3. M-pesa provides me with current transaction information (e.g., account balance).
Service Quality (DeLone & Mclean, 1992; Zhou, 2013).	1. M-pesa provides on-time services	1.M-pesa provides me with services in a timely manner (e.g., quick response time)
	2. M-pesa provides prompt responses	2. M-pesa provides quick responses to transaction queries (e.g., account balances)
	3. M-pesa provides personalized services	3.M-pesa provides personalized services
Utilization (Larsen et al. 2009; Junglas et al. 2009)	1. I utilize M-pesa for sending money	1. I use M-pesa for sending money
	2. I utilize M-pesa for receiving money	2. I use M-pesa for receiving money
	3. I am very dependent on M-pesa	3. I am very dependent on M-pesa for monetary transactions.
Trust (Zhou, 2013)	1. M-pesa service provider is trustworthy	1. M-pesa service provider (safaricom) is trustworthy
	2. M-pesa service provider keeps its promise	2. M-pesa service provider (safaricom) fulfils its promise(s)
	3. M-pesa service provider keeps customers' interest in mind	3. M-pesa service provider (safaricom) keeps customers' interest in mind
Flow Zhou 2013	1. When using M-pesa, my attention was focused on the activity	1. When using M-pesa, my attention is focused on the activity
	2. When using m-pesa, I feel in control	2. When using M-pesa, I feel in control of the activity
	3. When using m-pesa, I find a lot of pleasure	3. When using M-pesa, my attention is not easily diverted
		4. When using M-pesa, I enjoy it.
Satisfaction (Bhattacherjee, 2001a; Zhou, 2013)	1.I feel satisfied with using M-pesa	1. I feel satisfied using M-pesa
	2. I feel content with using M-pesa	2. I feel content using M-pesa
	3. I feel pleased with using M-pesa	3. I feel pleased using M-pesa
Continuance Intention Bhattacherjee (2001a); Bhattacherjee et al. (2008).	1. I intend to continue using M-pesa rather than discontinue its use	1. I intend to continue using M-pesa to send money
	2. My intentions are to continue using M-pesa than use any alternative means	2. I intend to continue using M-pesa to receive money

	3. If I could, I would like to discontinue my use of M-pesa.	3. My intentions are to continue using M-pesa rather than use any alternative means
		4. I would like to discontinue my use of M-pesa

4.2.2.1.3 Construct Validity

Construct validity is the extent to which a factor measures its target measure, and is often required where there is operationalization of constructs (Straub et al. 2004). It is concerned with whether selected items are in harmony and also if they can jointly reflect the core of the labelled construct, void of the substance of the items (Straub, 1989; Boudreau et al. 2001). Thus, construct validity is attained by eliminating the odds that latent constructs are captured by the options in the measurements, and is established by testing convergent and discriminant validity, which are discussed next.

4.2.2.1.4 Convergent and Discriminant Validity

Convergent validity is evident where each measurement item correlates strongly with its posited theoretical construct, whereas, discriminant validity is evident where each measurement item correlates weakly with all other constructs besides the one posited theoretically (Gefen & Straub, 2005). In essence, convergent validity is an assessment of whether two constructs posited to have a theoretical relationship, indeed possess such a relationship. Whereas, discriminant validity tests whether unrelated constructs posited to have no theoretical relationship, actually are distinct (John & Benet-Martinez, 2000).

Convergent validity can be assessed by viewing the factor loadings of the items of a given construct (Chin, 1998a), the composite reliability (CR[42]) of each construct, and the average variance extracted (AVE[43]) of the constructs. Additionally, convergent validity is attained when the AVE for each construct is above 0.50 (Chin, 1998b). Thus, convergent validity requires three conditions to be met: cross-loadings should be above 0.7 and at least equal to 0.5 (Hair et al.

[42] "Composite reliability is a measure of internal consistency reliability but unlike cronbach's alpha, does not assume equal indicator loadings (Hair et al. 2014a). Indicators should be above 0.7 but levels between 0.6 and 0.7 for exploratory studies are acceptable (Hair, Hult, Ringle, & Sarstedt, 2014b, p.115)

[43] AVE examines the level of variance that is accounted for by a construct in view of the level of variance resulting from measurement error (Fornel & Larker, 1981)

2014a); reliability should exceed 0.7 and average variance explained (AVE) should be at least equal to 0.5 (Hair et al. 2014a). Conversely, discriminant validity is tested by identifying the square root of the average value for each construct and comparing them against their correlation with other constructs (Chin, 1998b). This requires that the AVE of a determinant should be larger than the squared correlation of itself in comparison to other determinants. Where the AVE for each construct is greater than its shared variance with any other construct, discriminant validity is established (Fornell and Larcker, 1981).

4.2.2.1.5 Reliability

Reliability is the extent to which a set of items are consistent in measuring a given construct (Straub et al. 2004). It illustrates that the operations of a study can be replicated across similar settings and yields the same results (Yin, 2003). It is also an account of measurement accuracy that seeks to eliminate the possibility of inconsistent and flawed results (Rogers, 1995). This study employs an accepted test of inter-item consistency reliability, known as Cronbach's alpha coefficient (Cronbach 1951; Nunnally 1978; Sekaran, 2000). Cronbach's alpha is a test of the consistency of responses to all items measuring a construct, and is reflected in the extent to which independent items of a construct correlate with each other (Sekaran 2000). Cronbach's alpha reliability coefficient ranges from 0 to 1, and while the coefficient has no lower limit, the closer it is to 1, the stronger the reliability of the instrument (Gliem & Gliem, 2003). Accordingly, leading statisticians; Hair et al. (2014a) recommend reliability scores of 0.7 or higher as an ideal threshold. The recommended threshold of 0.7 is applied to this study.

4.2.4 Sampling

Sampling is the statistical procedure of selecting a section of a population of interest with intention to examine and make statistical inferences about that population (Bhattacherjee, 2012, p.65.). It is a meticulous trait for a researcher to include all relevant and subtle details of the sampling process (Fowler, 2001; Babbie, 1990), because efforts to provide details of the sampling process enables an audience to determine the rigour, validity, and level of representation of the sample in light of the study's results. Further, sampling provides a strategic lens through which a researcher may select appropriate participants for the investigation of a phenomenon, and thereafter use their responses to generalize to the vast population being sampled (Pinsonneault & Kraemer, 1993). That said, the sampling processes employed in this study are discussed next.

4.2.4.1 Sample Population (Unit of Analysis)

A sample population refers to all individuals or items possessing characteristics that a researcher seeks to examine (Bhattacherjee, 2012, p.65). The forthright identification of the unit of analysis in a study helps the researcher categorize a specific unit to be investigated (Blanche et al. 2006; Yin, 1994). Unit of analysis is therefore the extent to which the collected data captures characteristics of a target object (e.g., individuals, groups, or organizations) (Zikmund, 2000; Sekaran, 2000). This study's focus is on determining user continuance intention towards M-pesa in Kenya, and thus specifies that the unit of analysis is at an individual level because it aims to predict individual user continuance intention towards M-pesa in Kenya.

4.2.4.2 Sampling Frame

A sample frame refers to a subset of members of a population from which a sample is taken (Wright, 2005). In essence, it is an accessible segment of the target population from where a sample can be drawn (Bhattacherjee, 2012). In this study, Kenya was selected as the country for investigation as it is host to majority- 17 million of M-pesa users in the globe (CCK, 2012). Within Kenya, Nairobi was the selected city for data collection because it is the town of M-pesa's launch (Hughes & Lonie, 2007), the country's economic hub (Neven, Reardon, Chege, & Wang, 2006, p.108), and there are over 4000 [44]M-pesa agent stores there; which enables easy accessibility to the target population of users of M-pesa.

4.2.4.3 Sampling Technique[45]

For this study, a probability sampling [46]technique was selected, particularly; systematic sampling[47]. This sampling technique entails a random beginning and then advances with the

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[44] See www.safaricom.co.ke/images/downloads/personal/M-pesa/Agent-locations/nairobi.pdf.

[45]**Note**: The selection of the employed sampling technique was based on sample technique selection protocol posited by Saunders et al. (2009, p.233).

[46]Probability sampling is often affiliated with survey-based study strategies where the researcher needs to make inferences from a sample about a population to answer his/her RQ(s) (Saunders et al. 2009, p.214)

[47]a probability sampling technique that requires the researcher to select the sample at regular intervals from the sampling frame. (Bhattacherjee, 2012; Saunders et al. 2009).

selection of every *k*th element from that point forward, where $k = N/n$, where k is the ratio of sampling frame size N and the desired sample size n, and its formal title is the *sampling ratio* (Bhattacherjee, 2012, p.67). The clout of systematic sampling is its assurance that there is no overrepresentation of a single characteristic within a sample, rather various characteristics amongst the selected sample are generally uniformly represented (Bhattacherjee, 2012; Saunders et al. 2009).

4.2.4.4 Sample Size

In selecting a suitable sample size for this study, the researcher considered that generalizations about population based on data collected using a probability sample is dependent on statistical probability (Saunders at al. 2009). A larger sample size decreases the likelihood of error in generalizing to the population (Saunders et al. 2009). To make substantial statistical inference, researchers usually target a 95% level of certainty; implying that where a sample was selected 100 times, a minimum of 95 of these samples would conform to the characteristics of the population (Saunders et al. 2009). To ensure a substantial confidence level of data and a low margin of error in this study, the researcher adheres to guidelines provided by Saunders et al. (2009, p. 219); where a population of 10 million and over would require at least 384 responses for a 5% margin of error. In the present study's context, M-pesa has a consumer base of over 17 million in Kenya. Thus, the researcher anticipates a requirement of twice the estimate (384*2= 768) noted by the aforesaid authors, for a 5% margin of error.

4.2.5 Survey Instrument Administration

The proliferation of M-pesa in Kenya enables this study to lend itself to the selection of an intercept (face-to-face) method as a survey administration protocol. This technique is reported to be a cost-effective, personal interviewing method that ensures high quality accurate data in a timely manner (Bush, & Hair, 1985). In employing an intercept protocol, the researcher trained 10 assistants to aid in the administration of surveys to target participants.

Questionnaires were distributed to individuals in communities[48] within Nairobi, Kenya. The researcher adopted a data collection technique similar to the mall intercept face-to-face, [49] which this study terms the agent intercept. The employment of the agent intercept was considered because it fits within the framework of systematic sampling; the sampling technique selected for this study. This approach entailed that the researcher and his assistants stood in communities that had M-pesa agent stores and approached individuals on departure from the stores. The agent intercept was an appropriate method for the data collection from M-pesa users' because it enabled a favourable probability for intercepting key informants (user of M-pesa) within its proximity. In essence, communities that M-pesa agents operated were likely vicinities to find users of M-pesa; the sought respondents to the study's questionnaire. To select data collection points (agent location); the researcher downloaded a list[50] from safaricom's website containing locations of M-pesa agent stores within Nairobi. This download from safaricom's website was an 84 page list, with about 58 names and locations of agents on each page. To fit the selection process of agents within the framework of a systematic sampling, the researcher and his assistants each identified a familiar community on this list. For each community, the M-pesa agents on the list were assigned a number, and each assigned number was written on a piece of paper, rolled up, put in a ballot box, and joggled to ensure no hidden number of ordering. Thereafter, the researcher and his assistants, each picked a piece of paper from the box, revealed the number, and mapped it to the agent listing of their respective community. The selection of M-pesa agents via the ballot process (random selection) was also an endeavour to mitigate the limitation of representativeness of M-pesa users, which is a possible limitation of this method. Essentially, the agent on the list that matched the ballot selection was the assigned community of data collection. To collect the data, a systematic sampling approach was followed. Although this approach is acknowledged for capturing an evenly sampled population, its strength will be compromised where a pattern in the population exists and overlaps with the interval set by the researcher. To counterpoise this possible compromise, research assistants were instructed to begin questionnaire distribution following a random interception of passer-by within their selected community (e.g., approaches the 4th passer-by and invites him or her to participate). Subsequently, an interval number (e.g., 6),

[48]The communities included: Embakasi, Lavington, South C, South B, Nairobi CBD, Westlands, Parklands, and Karen.
[49]The mall intercept is a data collection technique that entails stopping individual in a public space (e.g mall) and then inviting them to participate in a survey (Bush & Hair, 1985).In essence, intercept studies require the selection of respondents by intercepting them in a public arena, requesting their audience, and subsequently screening them for criteria to determine eligibility to participate.
[50] The list can be accessed at: http://www.safaricom.co.ke/images/Downloads/Personal/M-PESA/Agent-Locations/nairobi.pdf

different from the starting number must be identified, which served as the intermission protocol between respondents. In effect, following a random selection of participant 4, and an interval selection of 6; subsequent interception followed passer-by 6, 12, 18, 24, 30. Criteria for participation in this study was being an adult (18 and above) and a user of M-pesa, as the study aims to report on determinants of user continuance intention towards M-pesa. Thus, the intercept protocol was to salute intercepted individuals, request for a few minutes of their time, inform them of our quest, and that eligibility to participate required an adult status of 18 and above, and use of M-pesa. Thereafter, eligible and interested individuals' were given an introductory letter to the study which contained: an introduction of the researcher, context of the study, goal of the study, voluntary participation, anonymity of response, and their right to withdraw from participating at any time. Participants' willingness to proceed with filling out the questionnaires was then taken as their formal consent to participate in the study. This data collection technique has been employed in extant studies (e.g., Adapa & Cooksey, 2013; Case, Dey, Lu, Phang, & Schwanz. 2013; Bush & Hair, 1985; Miller, Wilder, Stillman, & Becker, 1997; Thogersen & Zhou, 2012) and is reported to yield high response rates. Notable strengths of intercept protocols in the aforesaid extant studies include: reduced item omission rate and higher response rate, whereas, a key limitation is: it has potential to limit the generalizability of findings. To counteract the limitation of the agent intercept to some degree, the researcher collected data within several communities as opposed to one. The survey instrument measured responses to the predictor and criterion variables on a seven point likert scale[51].

4.2.5.1 Data Collection Sites

A brief description of the data collection sites are presented in table 4.5 to provide the reader with background to the communities surveyed.

Table 4.5 Surveyed Communities

Name of Site	Description
Lavington	Lavington is a high-income residential suburb within Nairobi, Kenya (Henry, Yongsheng, & Jun, 2006; Abdulaziz & Osinde, 1997), and is classed within the Westlands administrative division of Nairobi.

[51] 1-strongly disagree, 2- disagree, 3- somewhat disagree, 4- neutral, 5-somewhat agree, 6-agree, 7- strongly disagree.

Embakasi	Embakasi is located 18km east of the central business district. It is a residential estate that houses mostly middle-class citizens (Business Daily, 2015[52])
South C[53]	South C, also known as 'mombasandogo,' is also a middle-class residential estate located within the south of Nairobi.
South B[54]	South B is a middle-class estate within Nairobi, and is located within the Makadara division of the city.
Nairobi- Central Business District (CBD)[55]	The CBD is a central location for business within the city, and is populated with individuals across social classes.
Westlands	Westlands lies 3.1 km, northwest of the Nairobi CBD. It is an affluent neighbourhood, hosting both residential and major shopping malls in Nairobi, and is mostly populated by expatriates (Abdulaziz & Osinde (1997, p.43, 50).
Parklands	Parklands is also a mixed commercial/residential middle-income neighbourhood. It is about 5km, northwest of Nairobi CBD (Henry et al. 2006). The neighbourhood is predominantly populated by individuals' of Asian descent.
Karen	The suburb of Karen is a high-income neighbourhood, south west of Nairobi CBD (Henry et al. 2006). It is predominantly inhabited by people of European descent.
Lang'ata	Lang'ata lies east of Karen, and south west of Nairobi-cbd. This suburb comprises several small housing estates and several tourist attractions (Henry et al. 2006), such as: the Giraffe Centre, Bomas of Kenya, and an entry to the Nairobi National Park).

4.3 Data Screening

To ensure that the data collected for this study are of integrity, the following discussed measures were enforced.

4.3.1 Missing Value Analysis

Missing data is concerned with circumstances where values on one or more variables are not present for analysis. This is a common predicament in survey research because a large number of sample is required and often involved (Bryman & Cramer, 2011). To expound on the issues of missing data, Hair, Black, Babin, Anderson, & Tatham (2006) write that missing data presents two key concerns: (i) it curtails the propensity of statistical techniques to infer a relationship in a data set, and (ii) it enables biased parameter estimates. Missing data can be infectious dependent

[52] www.businessdailyafrica.com/Embakasi-leads-in-property-demand--/-/539552/2267614/-/2q5p0mz/-/index.html
[53] www.hassconsult.co.ke/index.php?option=com_janews&view=janews&itemid=161
[54] www.howwemadeitinafrica.com/the-evolving-east-african-housing-dream-the-case-of-Kenya/36088/
[55] See- www.radissonblu.com/hotel-nairobi/location

on the rate of occurrence, the pattern of missing data, and the rationale for missing values (Tabachnick & Fidell, 2001). It is therefore critical for the researcher to identify the patterns and associations central to the missing data, to preserve a close to identical distribution of value following application of a remedy (Hair et al. 2014a). On this note, Hair et al. (2006) highlight that cases where the pattern of missing data is systematic (i.e., missing at random (MAR[56])), whichever procedure utilized to treat the data could yield biased results. But, if the data is missing in a random manner (i.e., missing completely at random (MCAR[57]), whichever treatment employed to address the problem should capitulate satisfactory results. In dealing with missing data situations, Hair et al. (2014a) propose the following rules of thumb, captured in table 4.6 and 4.7, for dealing with high levels of missing data and deletions based on missing data.

Table 4.6 High-levels of missing data

Rule of Thumb
(i) Where data is missing below 10% for an individual case, it can be ignored. However, when the missing data arises in a particular non-random manner, it must be addressed[58].
(ii) The number of complete cases must be ample for the selected analysis technique if no replacement values are imputed for the missing data

Table 4.7 Deletions based on missing data

Rule of Thumb
(i) Variables missing as low as 15% of data are candidates for deletion but higher level of missing (20-30%) data may be treated
(ii) Ensure in general, decrease in missing data is substantial enough to warrant deletion of an individual variable or case
(iii) Cases missing data on the criterion variable should be deleted to circumvent any synthetic amplification in relationships with the predictor variables
(iv) Before deleting a variable, ensure that substitute variables, expectantly highly correlated, are present to characterize the goal of the original variable
(v) Attempt performing the analysis inclusive and exclusive of the deleted cases or variables to determine any striking variation.

That said, this study adheres to suggested steps by Byrne (2001) in addressing a missing data scenario. These are: (i) investigate the full amount of missing data, (ii) investigate the pattern of

[56]MAR: where missing values of Y depend on X but not Y (Hair et al. 2014a)
[57]MCAR: where values of Y are indeed a random sample of all Y values, with no patterns that suggests bias to the data.
[58]Non-random patterns require diagnostic tests which are catered for in statistical packages like SPSS missing value analysis function (Hair et al. 2014a. p. 47)

missing data, (iii) where required, identify suitable methods to address missing data. These steps are applied where required in the data analysis chapter.

4.3.2 Outlier Detection

Outliers are cases with a unique combination of characteristics considered distinct from the majority of captured cases (Hair et al. 2014a, p.62). While outliers are neither out rightly labelled useful or knotty, they must be interpreted within the boundaries of a study and should be assessed by the type of knowledge they offer. That said, outliers are considered beneficial when although different from the majority of the sample, present attributes of the populace that would not be recognized in the typical line of analysis. Whereas, knotty outliers do not embody the populace, offset the goal of the analysis, and are likely to alter the analysis (Hair et al. 2014). To tackle outliers in this study, two of three extant techniques (*Univariate*[59], Bivariate[60], *and Multivariate*[61]) of outlier detection were employed. Bivariate technique was deemed inadequate for this study because (i) it requires a large number of graphs (ii) it is limited to two dimensions at a time. Thus, given that this study proposes a comprehensive model containing 10 predictor variables and 1 criterion variable, Hair et al. (2014a) opine that a technique more suited to measure the several dimensions of each observation relative to some common point is catered for using the Mahalanobis D^2 measure (Multivariate technique).

To detect univariate outliers in this study, z-scores using the descriptive statistics function in SPSS were generated (Kline, 2005). A rule of thumb for univariate outlier detection is to exclude observations with standard scores of 2.5 or greater (for a sample size of 80), while for larger samples, a threshold of 3 to 4 is acceptable (Hair et al. 2006; Hair et al. 2014a). This study thus specifies a threshold of 3 for univariate outlier detection.

[59] Assessment of standardized scores which have a mean of 0 and standard deviation of 1 (Hair et al. 2014a)

[60] Assessment of scatterplots; where cases that reside markedly outside the proximity of the other observations will be depicted as isolated points in the scatter dot (Hair at al. 2014a)

[61] Mahalanobis D^2 measure: assesses each observations distance in multifaceted space from the mean centre of all observations.

4.3.3 Common Method Bias

The employment of survey instruments as a data collection tool necessitates checks for quality of the data collected because there are often biases associated with survey techniques (Lyberg & Kasprzyk, 1991; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Vicente & Reis, 2010). A key bias associated with survey instrument is common methods bias (CMB) (Podsakoff et al. 2003; Richardson, Simmering, & Sturman, 2009). CMB alludes to variance resultant to measurement method rather than to the construct or constructs supposedly represented by the measures (Podsakoff et al. 2003). To alleviate the concern of CMB, the researcher included a reverse-scored [62]item measuring the dependent variable (RCONT4) in the survey instrument to reduce single rating issues (Lindell & Whitney, 2001). Only a single reversed scored item was included in the survey instrument because in the researcher's experience, respondents often feel overwhelmed when a high-level of cognitive alert is required to fill out a questionnaire. Second, data is tested for the presence of CMB using Harman's one factor test (Podsakoff & Organ, 1986) and unmeasured latent construct technique [63](Williams, Edwards, & Vandenberg, 2003). Thus, in analysing the study's data with (i) Harman's one factor test, CMB is likely to be present if (a) entered items load on a single factor, (b) a single factor explains more than half of the variance in all items (Ning Shen & Khalifa, 2008). Whereas, to determine the presence or absence of CMB using unmeasured latent construct technique, Williams et al. (2003) propose the following instructive guidelines: (i) Examine the statistical significance of factor loadings of the common method factor (ii) For all indicators, the variance explained by the common method factor must be weighed against the indicator's variance elucidated by the common method factor. That said, CMB is unlikely to be present where the common method factor loadings of the indicators of the key factors are considerably greater than their common method factor variances (Liang, Saraf, Hu, & Xue, 2007; Podsakoff et al. 2003).

4.3.4 Normality

Normality in data is a key statistical assumption of multivariate analysis (Bai &Ng, 2005), and it assesses the extent to which the shape of a given variables data distribution conforms to a normal

[62]Reverse coding is a survey validation procedure where some items in the survey are phrased in the negative to assess respondents' cognitive alert while completing the survey (DeCoster& Claypool, 2004).
[63]Unmeasured Latent Construct is a technique conducted in smart-PLS.

[64]distribution (Hair et al. 2006). Majority of the extant statistical techniques (e.g., correlations, regressions, t-tests, ANOVA), run on the assumption that data succumbs to a normal distribution; the population from which samples are taken are normally distributed (Altman & Bland, 1995; Pallant, 2007; Field, 2009). That said, two approaches exist for assessing normality:

(i) Visual methods: these include histogram, leaf plots, box plot, P-P plot (probability to probability), and Q-Q plot (Quantile to Quantile) (Field, 2009). While visual methods have been criticized for their reliability in assessing normality (Oztuna, Elhan, & Tuccar, 2006), they are still considered useful because when data is presented visually, an audience can judge the distribution assumption themselves (Altman & Bland, 1996).

(ii) Normality tests: these are supplementary to visual/graphical tests (Elliot & Woodward, 2007), and include the D'Agostinoskewness test, Anscombe-Glynn Kurtosis test, kolmogorov-smirnov (K-S) test, Lilliefors corrected K-S test, Shapiro-Wilk test, amongst others (Oztuna et al. 2006; Elliot & Woodward, 2007; Peat & Barton, 2005). While these variety of tests exist, a commonly employed univariate test for detection of normality in data in the IS extant literature is skewness and kurtosis. On this note, recommendations vary amongst scholars in employing skewness and kurtosis values for normality assessment. For instance, Stevens (2001) recommends thresholds for skewness and kurtosis of (<2 and<7) respectively; Hair, Babin, Money, & Samouel (2003) reckon values of (-1 to +1 for skewness) and (-3 to +3) for kurtosis are acceptable, whilst Azzalini (2005) recommends values of (-2 to +2 for skewness) and (-3 to +3) for kurtosis. Given varying opinions in the extant literature, the researcher situates his adopted values of skewness and kurtosis within the noted ranges and stipulates the utilized values in this study will stand at (-2 to +2 for skewness) and (-3 to +3 for kurtosis).

4.4 Data Analyses Techniques

There are various techniques available for statistical analyses, thus, the selected ones for analyses in this study are discussed.

[64] The term Normal is a description of a proportional, bell- shaped distribution curve that captures the largest frequency scores in the middle, with less frequencies on both ends (Joreskog et al. (2001)

4.4.1 Motivation for selected statistical packages

For quantitative studies, researchers possess various needs for data analysis and also varied levels of statistical education and training. Mindful of this, there are several statistical software (SAS, R, STATA, SPSS, Minitab, etc.,) available in the market. Most of these software's cater for basic statistical analysis; nonetheless, some possess more advanced techniques. Therefore, the selection of an appropriate statistical package is dependent on a researcher's ability to determine the relevant statistical technique for various situations and align proposed statistical tests to software offerings.

For this study's data analysis requirements, multiple (three) statistical packages were employed. First, IBM statistical package for social sciences (SPSS) statistics software, version 22 was selected for the descriptive and exploratory section of the analysis chapter. SPSS is an advanced tool that is widely employed for analyzing a range[65] of statistical data.

Second, a PLS- SEM [66]approach was selected to validate the proposed research model of the study. More specifically, the selection of PLS-SEM was based on the objectives of the research (Gefen, Straub, & Rigdon, 2011), and it capacity to concurrently assess both a structural and measurement model (Vinzi, Trinchera, & Amato, 2010). In essence, SEM-PLS was selected because: (i) it gives optimum prediction accuracy based on its prediction orientation (Fornell & Cha, 1994), which is one of the objectives of this study; identify the determinants of user continuance intention towards M-pesa. SEM-PLS caters for predictions by determining the portion of the variance in the dependent latent variable that is explained by the independent latent variable. (ii) Where theoretical models are in an infant stage of development, SEM-PLS is apt (Chin & Newsted, 1999). The research model in this study is relatively new because of its integration and application in a non-surveyed context. (iii) Handles complex models with various structural model relationships (Hair et al. 2014b). This study has hypothesized 20 relationships, which can be viewed as several and complex.

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[65]Some of the statistical analytic capabilities of SPSS include:
(i)Descriptive statistics: cross tabulations, frequencies, and descriptive ratio statistics.
(ii)Bivariate statistics: means, t-tests, ANOVA, correlations.
(iii) Predictions for the identification of groups: factor analysis and cluster analysis
(iv) Reliability tests- cronbach's alpha
(v)Predictions for numerical outcomes: regressions
[66]PLS-SEM is a causal modelling technique applied to maximize the explained variance of a dependent latent construct (Hair, Ringle, & Sarstedt, 2011)

Third, ANN[67]was selected as a multi-state approach to verify the results generated by PLS-SEM. In essence, the study's research model is tested using PLS-SEM, and the results from SEM are imputted to the ANN. ANN is identical to the human brain because it can attain original information from a given situation during the training procedure. Haykin (2007) explains that the information obtained from training is saved with synaptic weights, then, based on test data, the training procedure adapts the synaptic weights of the ANN in a logical way to achieve the intended goal. Further, ANN acclimatization shows that it reacts to formative transformations in the data production course, and could be retuned to address conditional adjustments (Garson, 1998). As such, ANN is believed to surpass conventional techniques like regression tests (Chiang, Zhang, & Zhou, 2006). Typically, SEM is applied in social science research to validate hypothesized relationships but seldom is it integrated with other artificial intelligence techniques (Hsu, Shih, Huang, Lin, & Lin, 2009). SEM is a linear model that often generalizes the intricacies when analyzing relationships, such as 'technology use' related phenomenon (Venkatesh & Goyal, 2010). To overcome SEM's short-coming, ANN is employed in this study to identify intricate linear and non-linear relationships between the determinants of user continuance intention towards M-pesa. Further, ANN allows for improvement to its accuracy, in that, it evaluates its performance using mean-square error and regression, is designed to learn based on the imputed data, and is thus able to generalise to circumstances not considered previously by the network (Chan & Chong, 2012).

Last, while studies in other disciplines, such as: economics (Choudhary & Haider, 2012); Marketing (Phillips, Davies, & Moutinho, 2015) have applied ANN in their investigations, only few studies in the IS discipline have employed it (Shmueli & Koppius, 2010).

4.4.2 Method of Analysis

This study focuses on identifying underlying relationships between a criterion variable (continuance intention) and several predictor variables. The predictive nature of the study required that data be submitted to statistical packages and an artificial intelligence tool (SPSS, SEM-PLS, and ANN) for descriptive analysis, structural and measurement model analysis, and predictive analysis. The data analyses procedures employed in this study are outlined next.

[67]An ANN is a computer-based statistical information processor that is modelled on the human brain (Haykin, 2007).

4.4.3 Analyses Procedures

The use of a paper-based survey instrument required that the data from the individual questionnaires are imputed into an SPSS spread sheet for analysis. Thereafter, the following steps are followed to provide an operational understanding of the research.

Step 1- Screening and treatment of the data

First, reversed scored items are overturned to align the direction of their correlations with other items in the survey. Second, data set is examined for anomalies, outliers, and cases with missing data (Meyers, Gamst, Guarino, 2006). This process was a measure to ensure that the data is free from violation of sampling frame, outliers, missing values, and non-normal variables. Thereafter, the extracted data was labelled numerically and distinctly grouped.

Step 2- Respondent profiles and descriptive statistics

Demographic profiling is used in this study to segment the sample by considering similarities and differences within the unit. The demographic factors in this study included: gender, age, level of education, and annual income. Each of these variables is tabulated to present descriptive findings. Cross-tabulations are also presented to facilitate comparisons between variables and to aid presentation of possible patterns that may emerge along these lines.

Step 3- Test for Bias

To assess independence from common-method bias, data is submitted to Harman's one factor test, and for corroboration purposes, to unmeasured latent construct technique.

Step 4- Test for Confounds[68]

Data is submitted to an analysis of covariance (ANCOVA[69]) test to establish autonomy of possible non-hypothesized confounding effects on the dependent variable. The demographic factors (age, gender, education, and income) are tested for possible confounding effects.

[68]Confounds are extraneous variables in a model that correlate with both the independent variables and the dependent variable (VanderWeele & Shpitser, 2013).
[69]ANCOVA is a statistical technique that enables the comparison of one variable in two or more groups, considering variability of other variables called covariates (Glantz & Slinker, 2001).

Step 5- Test for Validity and Reliability (Measurement Model[70])

The measurement model specifies the indicators used to measure each construct in the research model and evaluates the extent to which a set of measures are consistent in representing their target construct (Gefen, Straub, Boudreau, 2000). This involves the evaluation of validity and reliability of scales. To assess validity and reliability data is submitted to tests of PCFA, AVE, and Cronbach's Alpha coefficient. These tests assess characteristics of the measurement model, in that, construct (convergent & discriminant), content, and reliability of the study's measures can be determined. The evaluation criteria employed for the measurement model's assessment are presented in table 4.8 below.

Table 4.8 Evaluation Criteria for Measurement Model

Measure	Criteria	Threshold
Cronbach's Alpha	Internal Consistency of a construct	0.70 is the least acceptable value for Alpha in initial phases of theory development or in adaptations of measurement instruments (Nunnally and Bernstein1994). Alpha values of 0.80 are deemed as a strict minimum for advanced stages of instrument development (Nunnally and Bernstein 1994).
Convergent Validity	Composite Reliability	CR above 0.70 is adequate for adapted instruments. Whereas, CR above 0.80 is a stringent threshold for advanced stages of instrument development (Nunnally and Bernstein 1994).
	Average Variance Extracted	AVE greater than 0.50 is acceptable, as it suggests that more than 50% of the variance in indicators is accounted for by the latent variable and not measurement error (Chin 1998b; Fornell and Larcker 1981).
Discriminant Validity	Fornell & Larcker's (1981) approach	AVE of a determinant must be greater than the squared correlation of the determinant with other determinants.
	Cross loadings	The correlation of each indicator with its associated construct must be larger than its correlation with any other construct.

[70]The measurement model represents the relationships between a construct and its associated measurement items (Tenehaus, Vinzi, Chatelin, & Lauro, 2005; Diamantopoulos and Siguaw, 2006).

Step 6- Structural Model and Hypotheses testing (RQ 1[71]and 2[72])

Following validation of the measurement model, the structural model can be assessed. Structural model assessment is the evaluation of the predictive relationships between constructs in a model (Ringle, Wende, & Will, 2005). To assess the structural model, data is submitted to SEM-PLS analysis. *Table 4.9* presents the techniques used in examining the structural model.

Table 4.9 Evaluation Criteria for Structural Model

Appraisal technique	Formulae	Notes
Coefficient of Determination (R^2Value): The proportion of a dependent constructs variance that is explained by its predictors (Hair et al. 2014b).	$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{[n(\Sigma x2) - (\Sigma x)2]\,[n(\Sigma y2) - (\Sigma y)2]}$	(i) R^2 gauges the predictive power of the predictor variables on the criterion variable (Chin 1998b; Chin 2010).
		(ii)High R^2 levels are required to be considered a significant explanatory power (Urbach and Ahlemann, 2010).
		R2 should hold a minimum value of 0.10 (Falk and Miller 1992).
PLS Path Coefficients: (β), Signs, and Significances	As programmed within PLS	(i) Path coefficients are evaluated using absolute value, significance and sign.
		(ii) Values close to 1 (or -1) suggest a strong influence of a latent variable on their causal successor, whereas values close to 0 indicate weak influence.
		(iii) Values above 0.2 (or below -0.2) can be regarded as substantial (Chin 1998b).
Effect size (f^2) assesses whether a given predictor variable holds a substantive impact on a criterion variable (Chin, 2010).	Effect sizes are calculated in stages: First, with the predictor variable included in the model. Second, with its exclusion from the model. The effect size is calculated based on R^2 of the criterion variable as follows: $f^2 = (R^2 \text{ included} - R^2 \text{ excluded})/ (1 - R^2 \text{ included})$	f^2 of 0.02, 0.15, 0.35 are interpreted as small, medium, large effects respectively (Chin 2010; Cohen 1988).
Q^2 (Cross-validated redundancy) symbolizes a quantification of predictive relevance of the model, (Chin, 2010).	$q2 = (Q^2 \text{ included} - Q^2 \text{ excluded})/ (1 - Q^2 \text{ included})$	$Q^2 > 0$ implies the model has predictive relevance, whereas $Q^2 < 0$ suggests a lack of predictive relevance (Chin 2010).

[71] RQ1: What are the antecedents of user continuance intention towards M-pesa?
[72]RQ2: What are the determinants of user continuance intention towards M-pesa?

Step 7- ANN (RQ2)

In fitting problems, ANN maps data sets of numeric input and a set of numeric targets. Thus, the significant predictor variables in this study after a PLS analysis will serve as the input variables, while the target is the criterion variable (Continuance Intention).

4.4 Ethical Consideration

The practice of ethics in conducting research is essential to guide researchers' quest in collecting, analysing, and reporting on data acquired from study participants. Privacy and confidentiality are pertinent ethical issues that must be carefully addressed. On this note, Diener and Crandall (1978) explain that privacy captures matters of the usage of the information acquired from participants, whilst confidentiality covers matters of protecting the identity of participants (Cohen, Manion, & Morrison, 2000). To ensure that an ethical practice is adhered to in this study, an ethics clearance application was submitted to University of Cape Town's ethics committee for a review of the proposed data collection protocol. This procedure is enforced to ensure that the researcher is abreast with the ethical considerations governing his or her selected research method. The ethics application entailed a full description of the researcher's data collection techniques. As such, ethics serves to bind a researcher to the stipulated ethical guidelines of his or her research institution.

In this study, the researcher declares that data collection was conducted in a manner that ensures each participant's anonymity and the confidentiality of their data (Blanche et al. 2006). Anonymity and confidentiality were achieved by ensuring that participants did not provide any identifying information beyond their basic demographic details; only aggregate results were reported and participants are not identified by name in the final report. Moreover, participation in this study was entirely voluntary because participants were informed of their right to opt out at any time without loss of any benefits. Participants' decision to complete the survey was taken as their formal consent to participate in the survey. No third parties will be provided any access to the raw data. Finally, the researcher has no financial interest, does not work for M-pesa, or/and its subsidiaries, and no monetary incentives were offered to participants. The approval of the ethics application was subject to the University of Cape Town's designated official's satisfaction as to participant's anonymity, confidentiality of data, and voluntary participation.

4.4.1 Reciprocity

Abstractly, reciprocity is an incentive to participants in a given study in exchange for information acquired from them (Creswell, 1998). As a goodwill gesture, researchers could reciprocate survey participants' time and effort by sharing the findings of the study with interested participants' (Creswell, 1998; Hamell, Carpenter, & Dyck, 2000). In this spirit, the researcher extended an offer to share the study's findings (at an aggregated level) with interested surveyed participants. Respondents were given a cover letter which contained the researcher's email address, and were informed that upon request via email, the researcher would share the results of the study at an aggregate level.

4.5 Chapter Conclusion

This chapter has extensively discussed the research design strategy, which includes: the methodology, ontological and epistemological considerations, data collection techniques and processes, and ethical considerations. First, it discussed the study's ontological and epistemological considerations, and then took a stance. Second, it discussed extant relevant methodologies and selected one with justification for its choice. Third, a data collection method was identified and justified. Subsequently a discussion of the instrument development was presented, and validity and reliability measures of the instrument design were presented. Fourth, sampling techniques were discussed, involving: selection of sampling population, frame, techniques, and size. Fifth, research instrument administration was discussed, which entailed; data collection techniques and sites. Sixth, data screening protocols were discussed. These involved: missing value analysis, outlier detection, common method bias, and checks for normality. Seventh, discussions and selection of data analysis packages and techniques were presented. The study identified three (SPSS, PLS-SEM, & ANN) statistical packages for its analyses. Eight, discussions of specific uses of the identified statistical packages were presented. Last, ethical considerations of the study were discussed. The next Chapter presents analyses of the data collected for the study.

5. DATA ANALYSES AND RESULTS

In God we trust, all others must bring data~ *W. Edwards Deming*

The previous chapter detailed the research design and strategy for the study. This chapter presents the analyses and results of data obtained for this study. Specifically, the chapter captures the response rate of the data collection phase, data treatment techniques, descriptive of the data collected, measurement model analysis, and structural model analysis. As such, it answers the RQ's posed in this study. RQ 1 and 2 enquired about the antecedents and determinants of user continuance intention towards M-pesa. Results of the structural model provide answers to these questions. Further to an analysis of the measurement and structural model, the researcher conducted some post-hoc analyses, such as: importance performance matrix analysis, mediator analysis, and moderator analysis.

5.1 Response Rate

Response rate in survey research assesses the number of persons invited to participate in the study and the number of individuals who actually complete the survey instrument (Shaughnessey, Zechmeister, & Zechmeister, 2012, p.149), and there are no standard expectations for response rates as they could vary across surveys. On this note, Sivo et al. (2006) write that response rates for survey studies could range from 3% to 100% because the researcher has no control over individuals freewill to participate in the study. In this study, the data collection phase yielded a total of 614 responses to the 800 distributed instruments. Thus, a response rate of 76.75% (614/800 * 100) was achieved. One hundred and eighty six questionnaires were unreturned. Individuals who collected these questionnaires, when approached and invited to participate in the survey, responded they were in haste and were happy to collect the questionnaire but would rather fill it out at a more convenient time and return to the researchers' stand; their promises went unfulfilled. The response rate for this study is however consistent with similar extant studies on technology use/mobile payment use (Zhou, 2013; Zhou, 2014; Ansari, Kheirabadi, Ghalamkari, & Khanjari, 2013; Wang, 2014; Jia, Hall, & Sun, 2014). Mindful of this, but more importantly, the response rate was considered adequate because a rule of thumb for the minimum number of data cases required to validate a study's research model using SEM-PLS is calculated as ten times the number of predictors (Chin, Marcolin, & Newstead, 2003). Nonetheless, several scholars (e.g.,

Jackson 2003; MacCallum, Browne, Sugawara, 1996; Muthén and Muthén 2002) caution that neither the above highlighted rule nor any other rule of thumb may be applied universally across studies, as suitable sample size for a study comes in a spectrum: ranging from the psychometric properties of a study's variables, strength of the association amongst the variables employed, the intricacies and size of the model, and the extent of missing data; these are often requirements to obtain reasonable parameter estimates. That said, while this study possessed only 10 predictors and collected 614 cases for analysis (numbers above Chin et al's. 2003 rule of thumb), the researcher was further satisfied with the sample size as extant studies (Bush & Hair, 1985; Zhou, 2013; Jia et al. 2014; Wang 2014) similar to the present one have analysed data and reported findings based on the this range of sample size.

5.2 Reverse Coding

Aforesaid in chapter four, reverse coding was incorporated in the survey instrument to assess the cognitive alert of survey participants while responding to the questionnaire (DeCoster & Claypool, 2004). One item [73]measuring the dependent variable was phrased in the negative. This required that the item be reverse coded because the researcher cannot establish the total score for the scale with average scores. Rather, he needs to convert the item to ensure a uniform bearing. The survey instrument employed a 7-point likert scale and applied the reverse coding protocol presented in table 5.1. The formula employed to recode the value in SPSS compute procedure was: **new value = (scale minimum + scale maximum) – old value.** In this study, the scale points ranged from 1-7. Thus, the formula applied was (1 + 7= 8) – old value.

Table 5.1 Reverse codes

Old Value	New value
1	7
2	6
3	5
4	4
5	3
6	2
7	1

[73] CONT4: I would like to discontinue my use of M-pesa.

Satisfied as to items correlations in a uniform direction, the researcher scrutinizes the captured data.

5.3 Excluded Responses

Of the 618 surveys collected for analyses, 18 questionnaires were excluded for the following reasons:

(i) Thirteen questionnaires had responses of strongly agree on all items including the reversed scored item. These respondents' indication of 'strongly agree' to the reversed scored item suggests that they were not cognitively alert or were disinterested in the subject and therefore unlikely to have exerted satisfactory cognitive effort in their response. The researcher thus perceived that these respondents were passive in their response and therefore excluded.

(ii) Five questionnaires had responses of neutral on all items and were deemed invalid for the study's goals, thus excluded. Literally, a neutral response indicates a lack of opinion or lack of interest in the topic. Given that the five cases had a neutral indicator on all items, the researcher intuited that these respondents were reluctant to exert the cognitive effort required to form an opinion. In accordance with the researcher's view, Baumgartner and Steenkamp (2001) explicate that where respondents choose a middle category on a scale, it is often due to evasiveness, indecision, or indifference. As such, the researcher decided to exclude these responses for the analyses of the study. The exclusion of the 18 questionnaires left a remainder of 596 surveys for analyses.

5.4 Missing Data

Aforesaid in chapter 4, missing data is concerned with situations where values on one or more variables are missing for analyses, and is a common pickle in survey research because a large number of sample is required and often involved (Bryman & Cramer, 2011). In filtering out cases of missing data, the following cases were identified. Of the 596 cases retained for analyses, 10 cases were candidates for exclusion for the following reasons:

(i) Four questionnaires were missing over 75% of responses and therefore deleted. Recall, this action is in accordance with Hair et al. (2014a, p.46) rule of thumb for case deletion based on missing data. The respondents' in this case, following their initial decision to participate, deemed the survey too onerous and thus decided to opt out. While the researcher could have attempted

persuading these individuals' to persevere, the ethical and objective boundaries of this study restrained the researcher from influencing respondents' decisions and actions.

(ii) Six questionnaires were missing responses to the criterion variable, and therefore deleted. The deletion of these six cases was again consistent with recommendation by hair et al. (2014a, p.46) rule of thumb for deletion of cases based on missing data. The rationale here is that cases with missing data for criterion variables are excluded to circumvent any synthetic amplification in relationship with the predictor variables (Hair et al. 2014a, p.46).

The exclusion of these 10 cases left a remainder of 586 cases. An examination of these 586 cases revealed complete responses to items measuring the independent and dependent variables. This is an interesting occurrence as it is atypical. Nonetheless, this occurrence of complete questionnaires is possibly due to the noted strength of intercept protocols: reduced item omission rate and high response rate (Bush & Hair, 1985; Gabriel, Leichtling, Bolan, & Becker, 2012). As such there was no need to engage in further analysis on missing data of the predictor and criterion variables. That said, data was missing on one of the demographic variables, where 17 cases did not capture respondents income. Besides this, responses to all items on the questionnaire were complete.

Satisfied as to complete data cases of the predictor and criterion variables, the researcher assesses the data for compliance with statistical assumptions, and begins with evaluation of the data for outliers.

5.5 Outlier Detection

Recall, outliers are cases with a unique combination of characteristics considered distinct from the majority of captured cases (Hair et al. 2014a: p.62). Also, that there are three techniques of outlier detection, however, this study employs two (univariate and multivariate) for efficiency purposes.

To detect univariate outliers, Z-scores were generated using the descriptive statistic function in SPSS v.22 for the 586 cases. Following Hair et al's. (2014a) rule of thumb for univariate outlier detection to exclude observations with standard scores of 2.5 or greater (for a sample size of 80), while for larger samples, a threshold of 3 to 4 is acceptable; for this study's sample size of 586, the researcher set the threshold at 3. As such, 49 cases with Z-scores of over 3 were detected and deleted; thus (586-49 = 537). Thereafter, the researcher ran descriptive for retained cases. Skewness and Kurtosis values on some of the variable items were still outside the recommended

range of ±2 and ±3 respectively (see section 8.6-Appendices, Appendix 6.). This circumstance necessitated the employment of a regression technique to further identify undetected univariate outliers. To do this, regression was run using the enter method, and the studentized residual [74]option was selected. This procedure generated and populated data in a created column in the data set, labelled *sre_1*, and contained values for identifying univariate outliers for the dependent variable. Thus, this approach facilitated a better view of detecting outliers as values in the studentized residual column that were greater than ±3 were detected by simply presenting the data in ascending order.

Second, to identify multivariate outliers, Mahalanobis D^2 for each case was calculated (Meyer's et al. 2006). The Mahalanobis D^2 is the remoteness of a given case from the axis of the other cases in a data set, where the axis is the point formed by means of all variables (Tabachnick & Fidell, 2001). In essence, Mahalanobis D^2 measures the distance to the group multivariate mean. A column (mah_1) containing Mahalanobis D^2 calculation was generated in the data set. However, the evaluation of outliers requires the probability of Mahalanobis D^2 and not the actual Mahalanobis D^2 scores. The CDF.CHISQ function was selected to compute the cumulative probability of Mahalanobis D^2. A high D^2 score indicates a case has an extreme value on one or more variables. To interpret the score of a Mahalanobis D^2, several scholars (e.g Byrne, 2001; Kline, 2005; Hair et al. 2006) recommend the application of a conservative statistical significance test; $p < 0.001$. In this study, data was submitted to Mahalanobis D^2 in SPSS version 22 and compared to the critical X^2 value with the degrees of freedom (df) equating the number of independent variables and probability of $p < 0.001$. Thus, following generation of Mahalanobis D^2 and the probability of Mahalanobis D^2, cases with less than a probability of 0.001 were candidates for deletion. To omit the outliers, the select case function listed under the data tab in SPSS was selected and a formula (if condition[75]) was imputed to exclude both univariate and multivariate outliers. Essentially, the formula specified that cases should be included if the studentized residual (despite the sign) is less than 3 and the probability for Mahalanobis D^2 is higher than the level of significance (0.001). The employment of Mahalanobis D^2 aided detection of 44 cases. Collectively, detection of univariate and multivariate cases of outliers totalled 93, and was deleted. Satisfied as to outlier exclusion, the researcher now assesses the data for normality.

[74] Studentized residual are Z-score computed for a case based on the data for all other cases in the data set.
[75] Abs(sre_1)<3.0 and p_mah_>0.001

5.6 Normality

The core postulation in multivariate analysis is assuming multivariate normality. Normality assesses the adherence of data to normal distribution which is the supposition for statistical methods (Hair et al. 2006). This is because many statistical methods undertake that the distribution of scores on dependent variables succumb to the bell-shaped curve; the majority of scores lie in the middle (Gravetter & Wallnau, 2000). Recall from the previous chapter, normality can be assessed by obtaining skewness and kurtosis values (Hair et al. 2006). The skewness value depicts the symmetry of the distribution, whereas, the kurtosis values represents the "peakedness" of the distribution (Pallant 2005), or the flatness of the distribution compared with the normal distribution (Kenny & Keeping 1962). To assess normality levels in this study, the researcher ran descriptive in SPSS on all variables. It was discovered that following outlier deletion, four variables still had skewness and kurtosis values outside (±2 and ±3) respectively. Thus, the researcher examined responses on each of the outlying variables to identify cause of deviation, and discovered that a few cases on each of these variables had Z scores of 2.9 (very close to 3), while majority had Z scores of ±2.5 and below. These cases (59) were excluded to determine possible improvement in skewness and kurtosis values. Following their exclusions, skewness and kurtosis values were now within the recommended range of (±2 and ±3), with a total of 434 retained cases for further analyses. The summary of the descriptive statistics are presented in table 5.2 below.

Table 5.2- Descriptive statistics of variables after outlier deletion

	Frequencies					Descriptive Statistics			
Variable	**N**	**Acronym of Variable**	**Variable Items**	**Valid**	**Missing**	**Mean**	**Standard Deviation**	**Skewness**	**Kurtosis**
Task Technology Fit	1	TTF1	The money transfer/deposit function of M-pesa allows me to send money	434	0	6.37	.554	-.113	-.820
	2	TTF2	The money withdrawal function of M-pesa allows me to receive money	434	0	6.32	.561	-.084	-.649
	3	TTF3	In general, the deposit (send money) and withdrawal (receive money) functions of M-pesa fully meets my money transfer needs	434	0	6.31	.536	.095	-.647
Post Usage Usefulness	4	PUU1	Over the year(s), I find that using M-pesa for sending money increases my productivity (e.g., makes sending money faster, efficient, and cost effective)	434	0	6.24	.569	-.189	.400
	5	PUU2	Over the year(s), I find that using M-pesa for receiving money increases my productivity (e.g., makes receiving money faster, efficient, and cost effective)	434	0	6.25	.587	-.390	.943
	6	PUU3	Over the year(s), I find that M-pesa meets my monetary transaction needs	434	0	6.24	.578	-.358	1.076
Confirmation	7	CONF1	My experience using M-pesa is better than what I expected before using it	434	0	6.32	.675	-.952	1.463
	8	CONF2	The service provided by M-pesa is better than what I expected before using it	434	0	6.22	.664	-.851	1.731
	9	CONF3	Overall, most of my expectations from using M-pesa were met	434	0	6.28	.690	-.778	.696
System Quality	10	SYSQ1	M-pesa quickly loads all text and images	434	0	6.13	.673	-.704	1.262
	11	SYSQ2	M-pesa is easy to use	434	0	6.24	.630	-.564	.939
	12	SYSQ3	M-pesa is easy to navigate	434	0	6.19	.620	-.556	1.304
Information Quality	13	INFQ1	M-pesa provides me with relevant information for/about my transactions	434	0	6.34	.648	-.834	1.185
	14	INFQ2	M-pesa provides me with accurate transaction information (e.g., account balance)	434	0	6.40	.608	-.729	.837
	15	INFQ3	M-pesa provides me with current transaction information (e.g., account balance)	434	0	6.37	.614	-.610	.376

Service Quality	16	SERVQ1	M-pesa provides transaction services in a timely manner (i.e., quick response time)	434	0	6.22	.685	-.708	.789
	17	SERVQ2	M-pesa provides quick responses to transaction queries (e.g., account balance enquires)	434	0	6.14	.612	-.512	1.374
	18	SERVQ3	M-pesa provides personalized services	434	0	6.18	.700	-.832	1.285
Utilization	19	UTL1	I use M-pesa for sending money	434	0	6.27	.535	.033	.075
	20	UTL2	I use M-pesa for receiving money	434	0	6.23	.568	-.328	1.231
	21	UTL3	I am very dependent on M-pesa for monetary transactions	434	0	6.22	.586	-.362	.968
Satisfaction	22	SAT1	I feel satisfied using M-pesa	434	0	6.47	.522	-.115	-1.431
	23	SAT2	I feel content using M-pesa	434	0	6.41	.510	.166	-1.473
	24	SAT3	I feel pleased using M-pesa	434	0	6.42	.512	.130	-1.491
Flow	25	FLOW1	When using M-pesa, my attention is focused on the activity	434	0	6.41	.631	-.967	1.637
	26	FLOW2	When using M-pesa, I feel in control of the activity	434	0	6.20	.589	-.693	2.581
	27	FLOW3	When using M-pesa, my attention is not easily diverted	434	0	6.30	.717	-1.189	2.118
	28	FLOW4	When using M-pesa, I enjoy it.	434	0	6.10	.713	-.959	1.727
Trust	29	TRUST1	M-pesa service provider (Safaricom) is trustworthy	434	0	6.27	.603	-.580	1.392
	30	TRUST2	M-pesa service provider (Safaricom) fulfils its promise(s)	434	0	6.05	.598	-.666	2.189
	31	TRUST3	M-pesa service provider (Safaricom) keeps customers' interest in mind	434	0	6.04	.623	-.778	2.588
Continuance Intention	32	CONT1	I intend to continue using M-pesa to send money	434	0	6.38	.545	-.262	.194
	33	CONT2	I intend to continue using M-pesa to receive money	434	0	6.34	.547	-.190	-.240
	34	CONT3	My intentions are to continue using M-pesa rather than use any alternative means	434	0	6.09	.692	-.926	2.360
	35	RCONT4	I would like to discontinue my use of M-pesa	434	0	6.30	.552	-.090	-.116

5.7 Demographic profiling

Demographic profiling is an endeavour to segment the sample by considering similarities and differences within the unit, such as: gender, age, level of education, and annual income, amongst others. In essence, they capture possible patterns that may emerge along these lines and provide further insights to a given phenomenon. Extant studies, to name a few: (Van den Bulte, 2000; Meuter, Bitner, Ostrom, & Brown, 2005; Pedersen, 2005; Ha & Stoel, 2004; Tellis, Prabhu, & Chandy, 2009), in the technology acceptance and use domain have reported the relevance of these inclusions. A more specific mapping to the extant literature of the selected demographic variables is as follows: Gender (Rogers, 1995; Goldsmith, Freiden, & Eastman, 1995; Ha & Stoel, 2004); Age (Rogers, 1995; Tellis et al. 2009); Education (Rogers, 1995; Van den Bulte, 2000; Tellis et al. 2009); Income (Rogers, 1995; Tellis et al. 2009). Consistent with the aforesaid extant studies that included these variables and reported positive correlations, they were adopted for this study. Additional questions probing period of M-pesa use, frequency of M-pesa use, primary use of M-pesa, suggested extensions to current M-pesa service offerings, and mobile platform that respondents' operate M-pesa on, was also posed to provide added insights of usage of M-pesa amongst the respondents. Data captured on demographic profiles are presented next.

5.7.1 Gender

Table 5.3- Gender Profile

Gender	Frequency	Percent
1. Male	204	47.0
2.Female	230	53.0
Total	434	100.0

A descriptive of the data on respondents gender reveals that data collected from the sample population is a fair representation across gender groups. This allows for an assessment of extant study position that attitudes and perceptions of gender differ towards technology use (Gefen & Straub, 1997; Venkatesh & Morris, 2000; Venkatesh et al. (2003). A statistical assessment of genders influence on continuance is conducted and results presented in section 5. 9.1.

5.7.2 Age

Table 5.4 - Respondents Age Profile

Age Categories	Frequency	Percentage
1.Less than 18	0	0
2. 18-30	296	68.2
3. 31-40	92	21.2
4. 41-50	38	8.8
5. Above 50	8	1.8
Total	434	100.0

The study captured data across the four categories. As earlier noted, data was not collected from individuals of less than 18 years for ethical reasons. Eligibility for participation was thus an adult status (18 years old and above). The acquisition of respondents' age, enables the researcher to assess whether view of extant studies applies in this study; that an individual's age influences use of a technology (Venkatesh & Morris, 2000; Venkatesh et al. 2003; Rogers, 1995; Tellis et al. 2009). A statistical test is conducted and results are presented in section 5.9.2 to determine the validity of ages influence on continuance intention.

5.7.3 Education

Table 5.5- Respondents' Education Profile

Education Categories	Frequency	Percentage
1.Primary	7	1.6
2. Secondary	43	9.9
3. Post-Secondary School (Certificate/Diploma)	57	13.1
4.University OR College	258	59.4
5.Post Graduate (Master, Doctorate)	66	15.2
6. Other	3	.7
Total	434	100

Extant study by Deursen et al. (2011) asserts that use of technology-enabled services is often low amongst individuals' with less education because they could lack knowledge and skills on the operational functions of the given device. This view is buttressed by Beier & Ackerman (2005),

that acceptance and use of a technology often involves fresh learning, and learning is subjective to personality distinctions in psychical capacity. Mindful of this, an education variable was included as control measure of user continuance towards M-pesa. A descriptive of the data collected on education levels of respondents' shows that majority of the participants have at least a post-secondary school qualification (certificate or diploma). This finding reflects statistics by the CIA Fact book (2014) on literacy in Kenya; that 87.4% of the population are literate (can read and write). This discovery could concur with view that education influences technology use (Rogers, 1995; Van den Bulte, 2000; Tellis et al. 2009). However, a statistical test is conducted to determine an actual influence of education on user continuance intention, and the results are presented in section 5.9.3.

5.7.3 Income

Table 5.6 - Respondents' Income Profile

Income Categories	Frequency	Percentage
1.Less than Ksh 500,000	216	49.8
2. Between Ksh 501,000 – 1,000,000	101	23.3
3. Between Ksh 1,001,000 – 2,000,000	78	18.0
4. Between Ksh 2,001,000 – 3,000,000	22	5.1
5. Over 3,000,000	9	2.1
Missing	8	1.8
Total	426	100.0

Kenya is considered a developing country with a GDP of $79.9 billion in proportion to a population of 45,010,056 (CIA Fact book, 2014). A GDP of this figure suggests that majority of individuals in the country are unlikely to earn beyond the minimum wage of Ksh11, 995 ($139)

per month[76]. Extant study by Pew Internet & American Life Project (2010) opined that individuals' of low-income earning are unlikely to use technology-enabled services because income levels indicates ones socio-economic status and has a significant power in distinguishing use or non-use of a technology (Jung, Qui, & Kim, 2001; Lenhart, 2002). Mindful of the economic state of the Kenya, income categories were created for this study. The data collected reflects some consistency with the U.S bureau of democracy, human rights, and labour report; majority of the respondents (308) were earners within the least income group. That said, this study included income as a control in assessing its influence on continuance intention. A statistical test is conducted in section 5.9.4 to determine whether income has an influence on continuance intention.

The above section has presented data on respondents' demographics. Next, the researcher presents respondents profile on the supplementary questions.

5.8 Supplementary Questions

Additional questions were included in the survey to further identify patterns that could segment the user population of M-pesa in Kenya, and these are presented next.

5.8.1 Period of Use

(i) How long have you been using M-pesa?

This question aimed to capture the period of M-pesa use. Given that M-pesa has been in existence for over 6 years, the categories captured were: (1) less than a year (2) 1-3 years (3) 3-5 years, and (4) over 5 years. Majority of the respondents reported in the third category; had used M-pesa for 3-5 years (n=163; 37.6%). Second majority indicated use period of over 5 years (n=124; 28.6%). Third majority indicated use period of one to three years (n=108; 24.9%). The least indication was a use period of less than a year (n=39; 9.0%). Table 5.7 below presents a summary of data for the respondents' period of use.

[76] The noted minimum wage is based on reports by U.S Bureau of democracy, human rights, and labour report (2013). http://www.state.gov/j/drl/rls/hrrpt/humanrightsreport/index.htm#wrapper.

Table 5.7 - Respondents' Period of M-pesa Use

Period of Use Categories	Frequency	Percentage
1.Less than 1 year	39	9.0
2. 1-3 years	108	24.9
3. 3-5 years	163	37.6
4.Over 5 years	124	28.6
Total	434	100

5.8.2 Frequency of Use

(i) How often do you use M-pesa?

This question probed respondents' frequency of use of M-pesa. Categories were: (1) Daily, (2) weekly, (3) monthly, and (4) other. The majority of respondents indicated (2) weekly use (n=188; 43.3 %). Second majority indicated (1) daily use (n=142; 32.7%). The third majority indicated (3) monthly use (n=89; 20.5 %). The least number of respondents indicated (4) other (n=15; 3.5%). A summary of participant response to frequency of use of M-pesa is presented in table 5.8 below.

Table 5.8- Respondents' Frequency of M-pesa Use

Frequency of Use Categories	Frequency	Percentage
1.Daily	142	32.7
2. Weekly	188	43.3
3. Monthly	89	20.5
4.Other	15	3.5
Total	434	100

5.8.3 Primary Use of M-pesa

(i) What is your primary use of M-pesa?

This question inquired of respondents, their main use of the M-pesa service, and *required a single selection*. Options were: (1) Send money, (2) receive money, (3) pay bills, (4) buy goods, and (5) other.

The majority of respondents indicated (1) sending money (n=205; 47.2%). The next majority was for receiving money (n=166; 38.2%). The third majority indicated use for paying bills (n=37;

8.5%), and the last group indicated use for buying goods (n=26; 6.0%). A summary of responses to primary use of M-pesa is captured in table 5.9 below.

Table 5.9 - Respondents' Primary Use of M-pesa

Primary Use Categories	Frequency	Percentage
1.Send Money	205	47.2
2. Receive Money	166	38.2
3. Pay Bills	37	8.5
4.Buy Goods	26	6.0
5. Other	0	0
Total	434	100.0

5.8.4 Extensions to Current M-pesa Service Offerings

(i) What extension(s) to your current M-pesa service offerings would you like to have in the nearest future?

This question sought to identify additional services required by present users of M-pesa. To analyse this question, all participant responses to the anticipated extensions to M-pesa were extracted using the descriptive- frequency count function in SPSS. Next, simple qualitative analysis techniques were used: thematic analysis. The researcher analysed the data for implicit and explicit ideas, and then created themes based on the ideas. These themes were then used as categories for analysis. Participant responses were grouped into 16 themes, and the number of times identical responses were reported is captured within each theme. Noteworthy, some of the participants misinterpreted this question by noting their grievances with M-pesa. Although grievance notes would prove useful for the advancement of continuance with M-pesa, and will be reported in an independent paper outside this thesis; for this study, the researcher is confined to reporting on responses that addressed the question of anticipated extensions to M-pesa. The responses are presented in table 5.10 below.

Table 5.10 Summary of responses to open-end question on anticipated extensions to extant M-pesa service offerings

Themes	Reasons extracted from participant response	Number of times Reported
Loans	"Loans"	5
	"Issue loans"	
	"Provide interest free loans"	
	"Take loans"	
	"Extend loan payment period"	
Increase in transfer limit	"Increase maximum transfer amount"	5
	"Amount of deposit to be increased please"	
	"Increase the amount of daily transfer limit"	
	"Increase the money deposit into a high figure"	
	"M-pesa should increase the maximum transfer amount and savings limit"	
Payment of school fees	"To pay fees with M-pesa"	2
	"To be able to pay institutions (e.g., Universities, Colleges, Schools, etc.)"	
International Remittances	"To send pesa abroad" "use as a visa card for international online shopping"	19
	"to be able to send money internationally"	
	"to be able to send money abroad"	
	"sending money outside the country"	
	"send money to other countries"	
	"Send and receive money from the Diaspora"	
	"receiving and withdraw cash outside Kenya"	
	"receive and withdraw pesa when in another country"	
	"M-pesa should extend their services to almost all countries outside Kenya"	
	"M-pesa should extend their services across the world"	
	"It should operate globally"	
	"It should operate in all African countries"	

	"International money transfer"	
	"International transfer from M-pesa users to other users abroad"	
	"International transaction"	
	"International money transfer"	
	"be able to use in east Africa in general"	
	"extend beyond the shores of Kenya and Tanzania"	
Interest based accounts	"Come up with another account of saving where your money gains interest"	6
	"For m-pesa to invest the money in the account and give interest at some point based on savings"	
	"Interest earning for amount deposited"	
	"Introduce interest on sending and receiving money"	
	"Subscribers to start earning interest on the deposit they make"	
	"Savings account"	
Customised user profiles	"customized user profiles to better security details"	1
Dollar based transactions	"Dollar transactions"	1
Loyalty points	"Earn loyalty points"	5
	"Earn loyalty points based on frequency of use"	
	"Earn more points after every transaction"	
	"Give bonuses or discounts for huge transactions"	
	"Increase the bonga points the more you put money on M-pesa"	
Link M-pesa to user bank accounts	"To allow transactions in the various banking systems"	3
	"M-pesa to other bank accounts"	
	"Enable me deposit funds to my bank account from M-pesa"	
24 hour withdrawal service	"Make it a 24 hour system"	3
	"Extend operation times into late hours of the night or even 24hours"	

	"should be open till late"	
Voice controlled function	"Introduce a voice controlled function in M-pesa"	1
Biometric technology	"Introduce biometric technology"	2
	"Use fingerprints instead of Id's for transactions"	
Link phone contacts for M-pesa transactions	"Ability to get phone contacts saved on phone memory"	4
	"Ability to select contacts from phone book instead of having to memorise or write it somewhere"	
	"Key in recipients number from contact list"	
	"Move name to M-pesa to avoid instances of sending money to the wrong number"	
Near Field Communication (NFC) service	"NFC services"	1
Tax Payment	"Pay my taxes via M-pesa"	1
Transport Payment	Payment of bus fare and even airline fares"	3
	"Use M-pesa to pay for bus fare"	
	"Use M-pesa to pay fare for public transport service vehicles"	
Transaction Statements	"Statement of transaction"	4
	"Statement of account up to three years"	
	"Automatic business statement after each transaction"	
	"I would like them to give me statements of my usage of money monthly"	
Inter-vendor transactions	"To be able to transact with other service provider not just safaricom"	3
	"Sending money to other service providers"	
	"Being able to send money to any subscriber"	
Expand Platform for M-pesa use	"Use M-pesa on other devices besides phones"	4
	"To have M-pesa on other mobile devices"	
	"To have M-pesa on other applications apart from phones"	

Rollback functionality	"Ability to retract money should I buy airtime mistakenly"	11
	"Able to reverse money when one sends to a wrong business number"	
	"An automated ability to recall or cancel a wrong transaction or to stop/freeze payment"	
	"Get back money sent to wrong number"	
	"I would like to see that if they are able to reverse a person's money if they send to a wrong number and the receiver withdraws the money that is not intended for them"	
	"In the event of sending money to the wrong person, a measure to ensure refunds"	
	"Initiate a refund policy"	
	"Have wrong transaction reversal"	
	"Refund money when you accidentally buy credit"	
	"Security if money is sent to wrong recipient"	
	"A function to return sent money"	

5.6.5 Mobile Device

(i) What kind of mobile device do you operate M-pesa on?

This question inquired of the mobile device on which participants use M-pesa. There were four options: (1) conventional mobile phone, (2) smart phone, (3) tablet, and (4) other. Responses ranged between option one and three. The majority of respondents indicated use of the service on (2) smart phones (n=221; 50.9%), the second majority indicated use on conventional mobile phones (n=210; 48.4%), and few (n=3; .7%) indicated use of M-pesa on tablets. Noteworthy, participant selection of mobile device on which they use M-pesa was self-reported and unverified by the researcher. A summary of responses are presented in table 5.11.

Table 5.11 - Respondents' Mobile Device for M-pesa Use

Mobile Platform	Frequency	Percentage
1.Conventional Mobile Phone	210	48.4
2. Smart Phone	221	50.9
3. Tablet	3	.7
4.Other	0	0
Total	434	100.0

The above section has presented data relating to the surveyed sample and groups within it; giving the reader a representation of the respondents' background. Next, the researcher proceeds to assess the influence of demographic factors on continuance intention. To do this, statistical tests are conducted and are discussed in the subsequent section.

5.9 Comparing Respondents on Demographic Factors

Demographic factors such as gender, age, education, and income were integrated within the study's research model to identify respondents' possible differences along these lines in influencing user continuance intention towards M-pesa. To determine possible differences within the studied population on demographic factors, the study's data was submitted to an independent samples T-test [77]and a one-way ANOVA[78]. A t-test examines whether a difference between two groups' averages is improbable to have arisen due to random chance in sample selection. The t-test's statistical significance and the t-test's effect size are the core outputs of the t-test. Statistical significance shows whether the difference between sample averages is likely to represent an actual difference between populations, and the effect size indicates whether that difference is large enough to be practically important. Analyses of the differences in demographic factors on user continuance intention towards M-pesa are presented next.

[77] A t-test is a statistical test that can determine if there is a significant difference between two groups on a dependent variable.
[78] ANOVA is a statistical technique used to determine possible differences in group means within a population (Hair et al. 2014a, p.666).

5.9.1 Gender

The study's data was submitted to an independent sample t-test to compare the average value of each group: males and females to the average value of the dependent variable (continuance intention). Thus, a requisite for a t-test is that the independent variable be nominal and consist of only two values and the dependent variable be a scale-level variable. The results of the t-test revealed that no significant difference exists between males and females in their responses towards continuance with M-pesa. The continuance variable consists four items (abbreviated as CONT) and responses by gender across these items are as follows:

CONT 1: t(432) = .79, p = .42; CONT 2: t(432) = .97, p=.32; CONT 3: t(432) = .59, p=.55; CONT 4: t(432) = .35, p=.72. On a seven-point likert scale with one being strongly disagree to continue use of M-pesa and seven being strongly agree to continue use of M-pesa, males averaged on the four items: CONT 1: 6.36 (SD = .584); CONT 2: 6.31 (SD=.543); CONT 3: 6.07 (SD=6.87); CONT 4: 6.29 (SD=.572). Whereas, females averaged on the four items: CONT 1: 6.40 (SD=.509); CONT 2: 6.37(SD=.550); CONT3: 6.11(SD=.696); RCONT 4: 6.31(SD=.535). A summary of the results of the t-test are presented in table 5.12 below.

Table 5.12 Independent Samples T-test

Group Statistics						**Independent Samples Test**						
Gender (Male-1 vs Female-2) Vs Continuance Intention		**N**	**Mean**	**Standard Deviation**	**Std. Error Mean**	**F**	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**
CONT 1	1-M	204	6.36	.584	.041	1.820	.178	-.793	432	.428	-.042	.052
	2- F	230	6.40	.509	.034							
CONT 2	1- M	204	6.31	.543	.038	.640	.424	-.979	432	.328	-.051	.053
	2- F	230	6.37	.550	.036							
CONT 3	1- M	204	6.07	.687	.048	.474	.492	-.594	432	.553	-.040	.067
	2- F	230	6.11	.696	.046							
CONT 4	1- M	204	6.29	.572	.040	.282	.596	-.356	432	.722	-.019	.053
	2- F	230	6.31	.535	.035							

Note: A seven point scale was used to measure responses and ranged as follow: (i) Strongly disagree, (ii)Disagree, (iii)Somewhat Disagree, (iv) Neutral, (v) Somewhat Agree, (vi) Agree, (vii) Strongly Agree.

5.9.2 Age

The One-way ANOVA compares the means of the samples of more than two groups in order to make inferences about the population means. It tests the null hypothesis that a sample of more than two groups is drawn from an identical population. A one-way between subjects ANOVA was conducted to compare the effects of Age on user continuance intention towards M-pesa within age brackets: 18-30, 31-40, 41-50, and 50 and above. Continuance intention was reflected by four items, and the results for each are as follows: CONT 1: [F (3,430) = .666, p=.573], CONT 2: [F (3, 430) = .180, p=.910], CONT3: [F (3, 430) = .348, p=.790], CONT 4: [F (3, 430) = .321, p=.810]. Collectively, these results suggest that for the study's sample, the age of individual users of M-pesa do not have an effect on continuance intention towards M-pesa, and a summary of the results are presented in table 5.13 below.

Table 5.13 One- Way Anova: Age and Continuance

Age vs Continuance		Sum of Squares	df	Mean Square	F	Sig
CONT 1	Between groups	.595	3	.198	.666	.573
	Within Groups	128.144	430	.298		
	Total	128.740	433			
CONT 2	Between groups	.162	3	.054	.180	.910
	Within Groups	129.368	430	.301		
	Total	129.530	433			
CONT 3	Between groups	.502	3	.167	.348	.790
	Within Groups	206.625	430	.481		
	Total	207.127	433			
CONT 4	Between groups	.295	3	.098	.321	.810
	Within Groups	131.558	430	.366		
	Total	131.853	433			

5.9.3 Education

The second executed one-way between subjects ANOVA was conducted to compare the effects of Education on user continuance intention towards M-pesa within six education categories (primary, secondary, post-secondary school, university or college, postgraduate, and other). Continuance intention was reflected by four items, the results for each are as follows: CONT 1: [F (5,428) = .887, p=.489], CONT 2: [F (5, 428) = .777, p=.567], CONT3: [F (5, 428) = .936, p=.457], CONT 4: [F (3, 428) = .474, p=.796]. Taken together, the above results suggest that for the study's sample, the education levels of M-pesa users do not have an effect on continuance intention towards M-pesa. A summary of the results are presented in table 5.14 below.

Table 5.14 One-Way Anova- Education and Continuance

Education vs Continuance		Sum of Squares	df	Mean Square	F	Sig
CONT 1	Between groups	1.321	5	.264	.887	.489
	Within Groups	127.419	428	.298		
	Total	128.740	433			
CONT 2	Between groups	1.165	5	.233	.777	.567
	Within Groups	128.365	428	.300		
	Total	129.530	433			
CONT 3	Between groups	2.241	5	.448	.936	.457
	Within Groups	204.885	428	.479		
	Total	207.127	433			
CONT 4	Between groups	.726	5	.145	.474	.796
	Within Groups	131.126	428	.306		
	Total	131.853	433			

5.9.4 Income

A final one-way test between subjects ANOVA was conducted to compare the effects of income on user continuance intention towards M-pesa within five income brackets (less than 500,000, 501,000-1000, 000, 1001, 000-2,000,000, 2,001,000 – 3,000,000, and over 3,000,000). Continuance intention was reflected by four items, the results for each are as follows: CONT 1: [F (4,421) = 1.610, p=.171], CONT 2: [F (4, 421) = .316, p=.867], CONT3: [F (4, 421) = .068,

p=.991], CONT 4: [F (4, 421) = .777, p=.541]. In sum, the above results suggest that for the study's sample, income levels of M-pesa users do not have an effect on continuance intention towards M-pesa. A summary of the results are presented in table 5.15 below.

Table 5.15 One-Way Anova: Income and Continuance

Income vs Continuance		Sum of Squares	df	Mean Square	F	Sig
CONT 1	Between groups	1.911	4	.478	1.610	.171
	Within Groups	124.952	421	.297		
	Total	126.864	425			
CONT 2	Between groups	.381	4	.095	.316	.867
	Within Groups	126.943	421	.302		
	Total	127.324	425			
CONT 3	Between groups	.123	4	.031	.068	.991
	Within Groups	190.123	421	.452		
	Total	190.246	425			
CONT 4	Between groups	.952	4	.238	.777	.541
	Within Groups	128.984	421	.306		
	Total	129.937	425			

Given findings that no significant patterns exist within the data across respondents' demographics, the researcher proceeds to determine the dimensionality, reliability, and validity of the constructs in the study.

5.10 Preparation for Factor Analysis

To determine dimensionality, reliability, and validity of the study, a factor analysis is imperative. Factor analysis requires a sample size of 50 cases, though above 100 is ideal (Hair et al. 2006). In this study, a total of 433 usable responses are available, therefore sample size meets eligibility for submission to a factor analysis.

5.10.1 Common Method Bias

The employment of survey instruments as a data collection tool necessitates checks for quality of the data collected because there are often biases associated with survey techniques (Lyberg &

Kasprzyk, 1991; Podsakoff et al. 2003; Vicente & Reis, 2010). A key bias associated with survey instrument is common methods bias (CMB) (Podsakoff et al. 2003; Richardson et al. 2009). To overcome the concern of CMB, the researcher included a reverse-scored item measuring the dependent variable (RCONT4) in the survey instrument to reduce single rating issues (Lindell & Whitney, 2001). Second, to assess freedom from bias, CMB is tested using Harman's one factor test (Podsakoff & Organ, 1986) and unmeasured latent construct technique (Williams et al. 2003).

5.10.1.1 Harman's One Factor Test

To test for CMB, data was submitted to Harman's one factor test (Podsakoff & Organ, 1986). All items of the research model were entered into a factor analysis. Subsequently, the results of the unrotated solution to a principal component analysis were examined to assess the number of factors that reflect the variance amongst the items. CMB is likely to be present if (i) entered items load on a single factor, (ii) a single factor explains more than half of the variance in all items. In this study, 31 items (independent variable items) based on the research model were submitted to a factor analysis. The unrotated solution to the PCA shows 10 factors with eigenvalues greater than 1. The first factor accounts for 8.294% of the variance, while the last factor accounts for 6.816%. Collectively, the 10 factors submitted to the CFA account for 76.643% of the variance in the data. As such, a single factor was unaccountable for more than 50% of the variance in the data set. The result of Harman's one factor test is presented below in table 5.16.

Table 5.16 Results of Harman's One Factor Test

Component	Initial Eigen Values			Rotation Sum of Square Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.063	22.783	22.783	2.571	8.294	8.294
2	2.994	9.659	32.441	2.525	8.146	16.440
3	2.514	8.108	40.549	2.465	7.952	24.392
4	2.094	6.754	47.304	2.408	7.767	32.159
5	1.740	5.612	52.915	2.396	7.729	39.888
6	1.691	5.456	58.372	2.357	7.603	47.492
7	1.608	5.189	63.560	2.349	7.576	55.068
8	1.578	5.091	68.652	2.348	7.573	62.641
9	1.289	4.159	72.811	2.228	7.186	69.827
10	1.188	3.832	76.643	2.113	6.816	76.643

5.10.1.2 Unmeasured Latent Marker Construct Technique

To corroborate the results of Harman's single factor test, a supplementary technique: unmeasured latent marker construct was employed to determine the presence of CMB (Podsakoff et al. 2003), and was executed with PLS software (Liang et al. 2007). To test for CMB in PLS, a common method factor was included in the PLS model to capture possible method influence. The indicators of the common method factor reflected all indicators of the variables in this study's model, and were linked to all factors in the model. To determine the presence or absence of CMB, Williams et al. (2003) propose the following instructive guidelines:

(i) Examine the statistical significance of factor loadings of the common method factor

(ii) For all indicators, the variance explained by the common method factor must be weighed against the indicator's variance elucidated by the common method factor.

That said, CMB is unlikely to be present where the common method factor loadings of the indicators of the key factors are considerably greater than their common method factor variances (Liang et al. 2007; Podsakoff et al. 2003). As shown in table 5.17 below, the original factor loading for each variable item is greater than their common method factor; suggesting that CMB is unlikely to be an issue in the data set. Satisfied as to data free from CMB, the researcher proceeds to test the research hypotheses.

Table 5.17 Results of Unmeasured Latent Marker Construct Technique

Construct	Items	Factor Loading	Method Factor Loading
Continuance (CONT)	CONT1	.834	.532
	CONT2	.865	.532
	CONT3	.772	.502
	CONT4	.793	.392
Task Technology Fit (TTF)	TTF1	.920	.111
	TTF2	.845	.037
	TTF3	.897	.189
Post Usage Usefulness (PUU)	PUU1	.882	.169
	PUU2	.923	.257
	PUU3	.882	.226
Confirmation (CONF)	CONF1	.913	.580
	CONF2	.844	.493
	CONF3	.901	.607
System Quality(SYSQ)	SYSQ1	.858	.552
	SYSQ2	.854	.494

	SYSQ3	.919	.585
Information Quality (INFQ)	INFQ1	.907	.523
	INFQ2	.942	.565
	INFQ3	.905	.521
Service Quality (SERVQ)	SERVQ1	.903	.566
	SERVQ2	.855	.483
	SERVQ3	.827	.552
Utilization (UTL)	UTL1	.865	.433
	UTL2	..837	.410
	UTL3	.795	.451
Satisfaction (SAT)	SAT1	.917	.401
	SAT2	.822	.378
	SAT3	.918	.426
TRUST	TRUST1	.860	.579
	TRUST2	.883	.564
	TRUST3	.847	.556
FLOW	FLOW1	.766	.520
	FLOW2	.778	.464
	FLOW3	.873	.597
	FLOW4	.748	.568

5.11 Assessment of Potential Confounding Effects

Preceding a test of the research model and hypotheses, it is imperative to rule out any possible confounding[79] effect of respondent characteristics on the results. To do this, data is submitted to an ANCOVA to examine the effect of one or more factors on the dependent variable, while suspending the effect of another variable. ANCOVA is an extension of ANOVA that provides means to statistically control the effect of variables that one does not seek to examine in a study. These extraneous variables are called covariates, or control variables. ANCOVA allows one to eliminate covariates from the list of possible explanations of variance in the dependent variable. As such, an ANCOVA test was run to control for potential confounding variables, enabling the reduction of error variance and leading to a larger F-value (Evans & Rooney, 2008). In this study,

[79] Confounds are extraneous variables in a model that correlate with both the independent variables and the dependent variable (VanderWeele & Shpitser, 2013).

a one-way between subjects analysis of covariance was conducted to assess the impact of the demographic variables on the dependent variable (continuance intention), consisting of four items. Because the items of the dependent variable were not aggregated to produce a composite, each demographic factor was tested against each of the four items measuring the dependent variable. The researcher controlled for demographics including age, gender, education, and income. The results of the ANCOVA revealed that there are no confounding effects across the demographic variables on the dependent variable. Results of the ANCOVA are presented in table 5.18 below.

Table 5.18 Results of ANCOVA test

Demographic Variables	Dependent Variable	F-ratio	Sig {p}	Partial n^2
Age	CONT1	.671	.570	.005
	CONT2	.192	.902	.001
	CONT3	.506	.678	.004
	CONT4	.331	.803	.002
Gender	CONT1	.000	.996	.000
	CONT2	.261	.610	.001
	CONT3	.069	.793	.000
	CONT4	.608	.436	.001
Education	CONT1	.616	.688	.007
	CONT2	.725	.605	.009
	CONT3	.922	.467	.011
	CONT4	.239	.945	.003
Income	CONT1	1.463	.213	.014
	CONT2	.393	.814	.004
	CONT3	.099	.983	.001
	CONT4	.637	.636	.006

Satisfied with knowledge that the research model is free of confounds, the researcher proceeds to conduct a factor analysis.

5.12 Factor Analysis

In research studies, data is submitted to a factor analysis (FA) to analyse the interrelationships amongst several variables and to group these variables by their common underlying dimension. In essence FA is employed to summarize a large set of variables into compact sets of components (Hair et al. 2006). That said, FA facilitates: (i) comprehending the structure of a set of variables, (ii) ensuring that employed items in a questionnaire actually measure their target underlying variable, (iii) reduction of a data set to a more succinct level (Field, 2006, p.619).

Noteworthy on FA is its categorization, namely: exploratory or confirmatory. Exploratory Factor Analysis (EFA) techniques are used to explore the underlying factor structures without a priori measurements of the number of factors and their loadings. Whereas, confirmatory factor analyses (CFA) are applied where there are a priori specifications governing a set of factor structures and their loadings (Venkatraman, 1989; Hair et al. 2006, p.105). In this study, the researcher conducts both categories of factor analysis. EFA is utilized to observe the underlying dimension of each construct, whilst CFA is used to test and confirm associations between the hypothesized constructs (Zikmund, 2003; Hair et al. 2006).

5.12.1 Exploratory Factor Analysis

Two fundamental steps involved in EFA are: (i) extraction, and (ii) rotation. The first step, extraction, determines the number of factors underpinning several variables (Miller, Acton, Fullerton, & Maltby, 2002). Extraction methods come in a variety; however, the principal component factor analysis (PCFA) is one of the most utilized in the extant literature. Its recognition stems in its reliability of assessments of variables free from errors (Luck & Rubin, 1987). The second step- rotation is engaged to present data loading in a more legible pattern. Orthogonal and Oblique methods are two key techniques of rotations (Tabachnick & Fidell, 2001). To distinguish between these two methods, Tabachnick & Fidell, 2001; Bryman & Cramer, 2011) explain that orthogonal methods operate under the assumption that extracted factors are uncorrelated, and oblique methods assume extracted factors are correlated.

In this study, PCFA and orthogonal model with varimax rotation were selected to perform factor analysis within SPSS- version 22. Justification for the selection of orthogonal rotation is that data generated within its framework possess greater generalizability and replicable power, weighed against oblique rotation, and analysis of orthogonal rotation is less obscure because results are reported as uncorrelated factors (Tabachnick & Fidell, 2001). As such, data was submitted to a PCFA and the results of the analysis conducted in SPSS are presented in table 5.19.

Table 5.19. Factor Analysis of the Independent Variables

SPSS v.22 Variable	Items	Factor									
		1	2	3	4	5	6	7	8	9	10
FLOW	FLOW3	.807									
	FLOW2	.787									
	FLOW1	.703									
	FLOW4	.670									
INFORMATION QUALITY	INFQ2		.894								
	INFQ1		.865								
	INFQ3		.861								
POST USAGE USEFULNESS	PUU1			.905							
	PUU2			.892							
	PUU3			.858							
TASK-TECHNOLOGY FIT	TTF1				.908						
	TTF3				.866						
	TTF2				.862						
SATISFACTION	SAT1					.897					
	SAT3					.893					
	SAT2					.806					
CONFIRMATION	CONF1						.845				
	CONF2						.840				
	CONF3						.808				
SYSTEM QUALITY	SYSQ2							.859			
	SYSQ3							.849			
	SYSQ1							.756			
TRUST	TRUST2								.837		
	TRUST3								.809		
	TRUST1								.805		
SERVICE QUALITY	SERVQ1									.814	
	SERVQ2									.814	
	SERVQ3									.813	
UTILIZATION	UTL1										.841
	UTL2										.802
	UTL3										.750

Notes: Extraction method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations
Kaiser- Meyer-Olkin Measure of Sampling Adequacy: .817
Bartlett's Test of Sphericity: $\chi 2$ = 7119.571; df= 465; p=.000
Factor Loadings with absolute values <0.10 are suppressed

Table 5.20 Factor Analysis of the Dependent Variable: Continuance Intention

Variable	Items	Factor
		1
CONTINUANCE INTENTION	CONT1	.826
	CONT 2	.863
	CONT3	.757
	CONT4	.821
EigenValue	2.675	
Percentage of Variance Explained	66.872	

Notes: Extraction: Principal Component Analysis
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: .798
Bartlett's Test of Sphericity: $\chi 2 = 664.390$; df= 6; p=.000

In this study, the conceptual research model consisted of 10 independent variables and 1 dependent variable. With reference to the results of the exploratory PCFA conducted on the data set, table 5.19 shows that a total of 10 factors (independent variables) emerged as conceptualized, whilst table 5.20 presents a single factor loading for the conceptualized dependent variable. Thus, construct items as conceptualized were correlated. This occurrence of a clean factor structure is atypical, and possible explanations for this outcome are presented next.

5.12.1.1 Possible Rationale for the Clean Factor structures

Desirable for any study is a clean factor structure; however, this occurrence is rare. Goldberg (1993) asserts that the design of a measure to yield a clean simple structure is not an easy quest and it's argued that in the human behaviour domain many traits are not univocal markers of a single dimension but instead represent a blend of two or more.

As such, the researcher offers his opinion on possible causes of a clean structure in this study. First, items were carefully selected from validated instruments within reputable IS research journals (e.g., MISQ, Decision Support Systems, and Computer in Human Behaviour). Second, the selected items were operationalized to fit the study's context and this went through a series of pre-test by academics that have insights on the subject matter, a pilot-test was conducted to assess respondent comprehension of the item wordings.

Third, the majority of respondents to the survey were degree holders (75%), and this possibly aided in a clearer understanding and response to the survey. Moreover, in selecting the items for

this study, the researcher was careful to adopt from the articles suites of items, select items that revealed high factors weights (above .65). This approach is consistent with some scholars view (e.g., Haynes, Richard, & Kubany, 1995; Smith & McCarthy, 1995), who opine that the best way to ensure collection of high quality data is through careful item selection and item analyses. Exemplary, where the articles contained five measurement items for a given construct, and only three of the five revealed high factor scores, the researcher adopted the potent three. The clean factor structures that emerged reinforce the epithet "garbage in, garbage out" as there are no substitutes for good data.

The factor analysis conducted in SPSS concludes the exploratory phase of the study's data. The researcher now proceeds to conduct confirmatory tests in SMART-PLS version 2.0. In PLS, for confirmatory purposes, a re-run of factor analysis is conducted, and the measurement and structural model of the study are tested. Prior to submitting the study's data to SMART-PLS, it is important to specify the design of the model in PLS (formative vs. reflective) since the constructs are not directly observed (i.e., constructs are measured by multi-item measures). To reach a decision on the study's model specification, the researcher explicates his followed guidelines next.

5.13 Construct Specification

A fundamental criterion in building a research model is specification of conceptual constructs, and this involves a careful examination of the conceptual associations between the primary construct and its measures. When a SEM approach is selected for data analysis, specification becomes crucial to enable the concurrent analysis of the data and the assessment of the structural and measurement models. Construct specification determines whether a construct should be modelled as formative[80] or reflective[81]. Where formative constructs are employed, the exclusion of a measurement indicator omits part of the conceptual domain of the construct (MacCallum & Browne, 1993), therefore necessitating the adoption of an ontologically complete construct for adequate analysis. Conversely, where constructs are reflective, excluding a measure or indicator does not alter the conceptual domain of the construct because the indicators are individually

[80] Formative modelling requires conceptually distinct and independent components of a construct
[81] Reflective modelling requires that measurement indicators are effects or manifestations of the construct

reflecting the underlying meaning of the construct in different ways. That said, Edwards and Bagozzi, 2000; MacKenzie, 2001) note that researchers often focus on the associations between construct and overlook assessing the relationship between constructs and their measures. Thus, construct misspecification increases the likelihood of measurement inaccuracy (Petter, Straub, & Rai, 2007), leading to adverse effects on the structural model (MacKenzie, Podsakoff, & Jarvis. 2005). Specifically, a Type 1 error [82]is likely to be present in model analysis resulting from poor model specification (Jarvis et al. 2003). In essence, this ostensibly trifling issue of construct misspecification could hamper meaningful theory inference and development. As such, to determine the composition of a construct as reflective or formative, Jarvis, MacKenzie, & Podsakoff (2003) and Petter et al. (2007) provide some guidelines. These guidelines are presented below in table 5.21.

Table 5.21Determinants of Formative vs Reflective construct modelling

Rule and Query	Formative Construct	Reflective Construct
1. Causal direction should be implied by the conceptual definition Q1. Do the indicators: (i) define features or (ii) intances of the construct? Q2.Would alterations to the indicator impact the construct? Q3. Would alterations to the construct impact the indicators?	Causality flows from items to construct 1.Indicators are central attributes of the construct 2.Modification of the indicators should alter the construct 3.Modification of the construct does not impact the indicators	Causality flows from construct to item. 1. Indicators express the construct 2. Modifications to the indicator does not impact the construct 3.Modifications to the construct alters the indicators
2. Interchanging the indicators Q1. Should indicators be identical? Q2.Do the indicators mirror a general idea? Q3 Would exclusion of an indicator alter the theoretic sphere of the construct?	1. Indicators may not be identical 2. Indicators may not have identical content or mirror a general idea. 3.Exclusion of an indicator may alter the theoretic sphere of the construct	1.Indicators should be interchangeable 2.Indicators should mirror a general idea 3.Exclusion of an indicator should not alter the theoretic sphere of the construct
3. Co-variation among indicators Q1: Should an alteration of one indicator influence changes in other indicators?	1.Not compulsory for indicators to co-vary with one another	1.Indicators should vary with each other
4. Nomological net of construct indicators Q1: Should the indicators have identical precursors and effect?	1. Nomological net for indicators could differ	1. Nomological net for indicators should be identical

With reference to the guidelines proposed by Jarvis et al. (2003) and Petter et al. (2007) on specification of model constructs, a reflective approach is utilized to model this study's variables.

[82] Type 1 error is realized where a spurious path in a model is found to be significant (MacKenzie, 2001; MacKenzie et al. 2005)

This is because constructs and measurement items in the present study were adopted from extant validated research in the extant literature which were modelled as reflective and are consistent with the criteria outlined for reflective models. That said, the researcher proceeds to sculpt the research model as reflective in PLS and begins presentation of the analysed data in PLS with results of a re-run confirmatory factor analysis (see table 5.22).

Table 5.22 Factor Analysis of the Independent Variables using SMART-PLS

PLS Variable	Items	**Factor** 1	2	3	4	5	6	7	8	9	10
FLOW	FLOW1	.773									
	FLOW2	.772									
	FLOW3	.872									
	FLOW4	.746									
INFORMATION QUALITY	INFQ1		.905								
	INFQ2		.941								
	INFQ3		.907								
POST USAGE USEFULNESS	PUU1			.884							
	PUU2			.917							
	PUU3			.886							
TASK-TECHNOLOGY FIT	TTF1				.923						
	TTF2				.865						
	TTF3				.878						
SATISFACTION	SAT1					.911					
	SAT2					.830					
	SAT3					.916					
CONFIRMATION	CONF1						.911				
	CONF2						.848				
	CONF3						.899				
SYSTEM QUALITY	SYSQ1							.861			
	SYSQ2							.850			
	SYSQ3							.918			
TRUST	TRUST1								.859		
	TRUST2								.878		
	TRUST3								.851		
SERVICE QUALITY	SERVQ1									.901	
	SERVQ2									.853	
	SERVQ3									.831	
UTILIZATION	UTL1										.868
	UTL2										.856
	UTL3										.769

Table 5.23 Factor Analysis of the Dependent Variable using SMART-PLS

Variable	Items	Factor
		1
CONTINUANCE	CONT1	.837
	CONT 2	.867
	CONT3	.763
	CONT4	.795

As shown in tables 5.22 and 5.23, the results of the confirmatory factor analysis conducted in SMART-PLS do not differ much from those presented by SPSS, thus validating the factor structures and items within the study's research model. As such, the researcher proceeds to assess the measurement model of the study.

5.14 Measurement Model Evaluation

The selection of a reflective approach to sculpt the study's research model requires a specification based approach in analysing the data (MacKenzie, Podsakoff, Podsakoff, 2011). Aforesaid, the measurement model portrays the relationships between a construct and its associated measurement items (Diamantopolous & Siguaw, 2006; Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). Thus, the measurement model serves to illustrate that the measures utilized in the analysis are valid and sufficiently reflect the underlying theoretical constructs. To validate the measurement model, the researcher assessed the reliability and validity of the model as outlined in chapter four (table 4.8). The results are presented in table 5.24 below.

Table 5.24 Internal Consistency and Reliability

Construct and Scale Items	No. of Items	Factor Loading	Cronbach α	Indicator Reliability[83]	Composite Reliability	AVE	SQRT of AVE	Mean	Standard Deviation
Continuance Intention	4		.834		.889	0.66	0.81	25.12	1.904
CONT 1		.837		0.695					
CONT 2		.867		0.751					
CONT 3		.763		0.582					
CONT 4		.795		0.632					
Task-Technology Fit	3		.867		.918	0.79	0.62	18.99	1.468
TTF1		.923		0.851					
TTF2		.865		0.748					
TTF3		.878		0.770					
Post Usage Usefulness	3		.878		.924	0.80	0.64	18.73	1.555
PUU1		.884		0.781					
PUU2		.917		0.840					
PUU3		.886		0.784					
Confirmation	3		.864		.916	0.78	0.88	18.83	1.799
CONF1		.911		0.829					
CONF2		.848		0.719					
CONF3		.899		0.808					
System Quality	3		.850		.909	0.77	0.59	18.55	1.686
SYSQ1		.861		0.741					
SYSQ2		.850		0.722					
SYSQ3		.918		0.842					
Information Quality	3		.906		.941	0.84	0.91	19.12	1.717
INFQ1		.905		0.819					
INFQ2		.941		0.885					
INFQ3		.907		0.822					
Service Quality	3		.827		.896	0.74	0.54	18.54	1.723
SERVQ1		.901		0.811					
SERVQ2		.853		0.727					
SERVQ3		.831		0.573					
Utilization	3		.778		.870	0.69	0.47	18.73	1.405
UTL1		.868		0.753					
UTL2		.856		0.732					
UTL3		.769		0.591					
Satisfaction	3		.863		.917	0.78	0.60	19.29	1.369
SAT1		.911		0.829					
SAT2		.830		0.688					
SAT3		.916		0.839					
Flow	4		.801		.870	0.62	0.38	25.01	2.101
FLOW1		.773		0.461					
FLOW2		.772		0.595					
FLOW3		.872		0.760					
FLOW4		.746		0.556					
Trust	3		.829		.897	0.74	0.54	18.36	1.575
TRUST1		.859		0.737					
TRUST2		.878		0.770					
TRUST3		.851		0.724					

Notes: AVE[84]= Average Variance Extracted- to establish convergent validity, whilst SQRT of AVE = Square Root of the AVE- to establish discriminant validity

[83] Indicator reliability is the square of a standardized indicator's outer loading (Hair et al. 2014b, pg.115).

[84] The AVE for each variable was calculated (cut off point >=.5) (Fornell & Larcker, 1981). The applied formula was: where ëi is the loading of xi on X, Var denotes variance, i is the measurement error of xi, and Ódenotes a sum (Fornell & Larcker 1981).

Results presented in table 5.24 show that alpha values and composite reliability for each variable item are above 0.70, and AVE scores are above 0.50, which meet the guidelines for assessing the measurement (Nunnally & Bernstein, 1994). Satisfied as to construct measures reliability and validity, the researcher proceeds to assess the structural model results.

5.15 Structural Model Evaluation (RQ 1 and 2)

The evaluation of the structural model entails an assessment of the model's predictive capabilities and associations between the constructs (Hair et al. 2014b, p.168), and therefore answers RQ 1- what are the antecedents of user continuance intention towards M-pesa? and RQ 2- what are the determinants of user continuance intention towards M-pesa in Kenya?

In assessing the structural model, first the researcher examines the data for collinearity. This is necessitated because the estimations of path coefficients in the structural model is dependent on Ordinary Least Squares (OLS) regressions of every dependent variable on its related antecedent construct. Thus to assess the structural model, the following steps presented in fig 5.1 were followed.

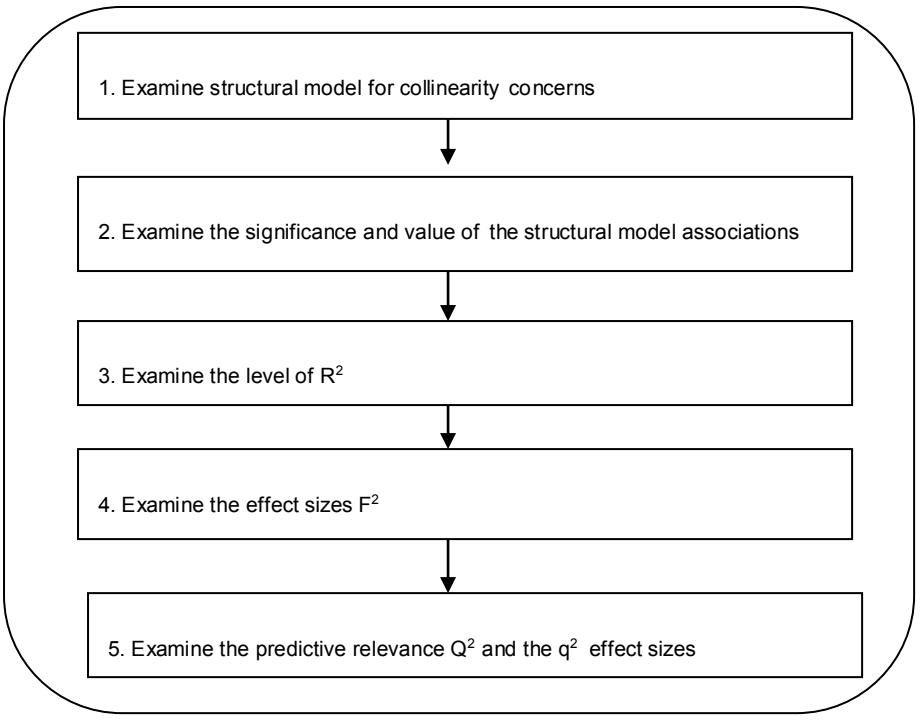


Fig 5.1 Modus Operandi for Structural model examination: adopted from Hair et al. (2014b, p.169).

Step 1- Examination of Collinearity[85]

To examine the study's model for collinearity, measures of tolerance and variance inflation factor (VIF) values were scrutinized. A rule of thumb is that each predictor construct's tolerance and VIF value should be above 0.20 but less than 5 (Hair et al. 2014b, p.186). This involved examining each set of predictor constructs in isolation for each sub-component of the structural model. To do this, the latent variable scores from the default report in PLS were copied. These were then used as input for collinearity assessment in SPSS. Multiple Regression was run on the independent variables and the dependent variable. The researcher then extracted the tolerance and VIF values from the SPSS output. Results are presented below in table 5.25, and show that all tolerance and VIF values are above 0.20 and less than 5 respectively; suggesting collinearity is not an issue in this study.

Table 5.25 Collinearity Assessment

Construct	Tolerance	VIF
TTF	.907	1.103
PUU	.910	1.098
CONF	.713	1.403
SYSQ	.713	1.403
INFQ	.764	1.308
SERVQ	.740	1.351
SAT	.871	1.148
TRUST	.759	1.318
FLOW	.677	1.476
CONF	.790	1.266

Step 2- Examination of the structural model path coefficients

In assessing the performance of the structural model, Chin (1998b) suggests application of the following performance criteria: (i) The coefficient of determination of the latent dependent variable, and (ii) t-statistics for assessing the estimation models reliability. The individual path coefficients [86]of the structural model indicate the direction and strength of the relationship between the model's constructs. Bootstrapping in PLS was run to provide the standard errors of coefficient estimates to examine the coefficients statistical significance without reliance on

[85] Collinearity is present where two indicators are extremely correlated. Whereas, the involvement of over two indicators is called multicollinearity (Hair et al. 2014b, p.115).
[86] Path coefficients are estimated paths between constructs in a model (Hair et al. 2014b, p.116)

distributional suppositions (Hair et al. 2014b, p.163). This information aids in determining the empirical t-value. The results of the test of significance for the structural model path coefficients are presented below in table 5.26.

Table 5.26 Test of Significance for the Structural Model Path Coefficients

Hypothesis	Path	Path Coefficient	T-Statistic	P-Value[87]	Sig. Level[88]	Result
H1	TTF → UTL	0.2556	5.504	6.36	***	Supported
H2	PUU → SAT	0.0597	1.183	0.23	NS	Unsupported
H3	CONF→ PUU	0.2042	3.765	0.00	***	Supported
H4	CONF → SAT	0.1181	2.140	0.03	**	Supported
H5	SYSQ→ SAT	0.0082	0.138	0.89	NS	Unsupported
H6	SYSQ → TRUST	0.2084	4.241	2.72	***	Supported
H7	SYSQ → FLOW	0.2649	4.720	3.18	***	Supported
H8	INFQ → SAT	0.0991	1.760	0.07	NS	Unsupported
H9	INFQ→ TRUST	0.1712	3.228	0.00	***	Supported
H10	INFQ→ FLOW	0.2143	3.779	0.00	***	Supported
H11	SERVQ → SAT	0.1333	2.344	0.01	**	Supported
H12	SERVQ → TRUST	0.2362	3.733	0.00	***	Supported
H13	SERVQ→ FLOW	0.2196	3.598	0.00	***	Supported
H14	TRUST→ FLOW	0.0941	1.532	0.12	NS	Unsupported
H15	FLOW→ SAT	0.0019	0.030	0.97	NS	Unsupported
H16	UTL→ SAT	0.1668	2.943	0.00	***	Supported
H17	UTL→ CONT	0.1605	3.389	0.00	***	Supported
H18	SAT→CONT	0.1445	3.196	0.00	***	Supported
H19	FLOW→ CONT	0.1554	2.945	0.00	***	Supported
H20	TRUST→ CONT	0.3846	7.670	1.14	***	Supported

Note: NS=not significant
*p<.10. **p<.05. ***p<.01

Step 3: Coefficient of Determination (R^2 value)

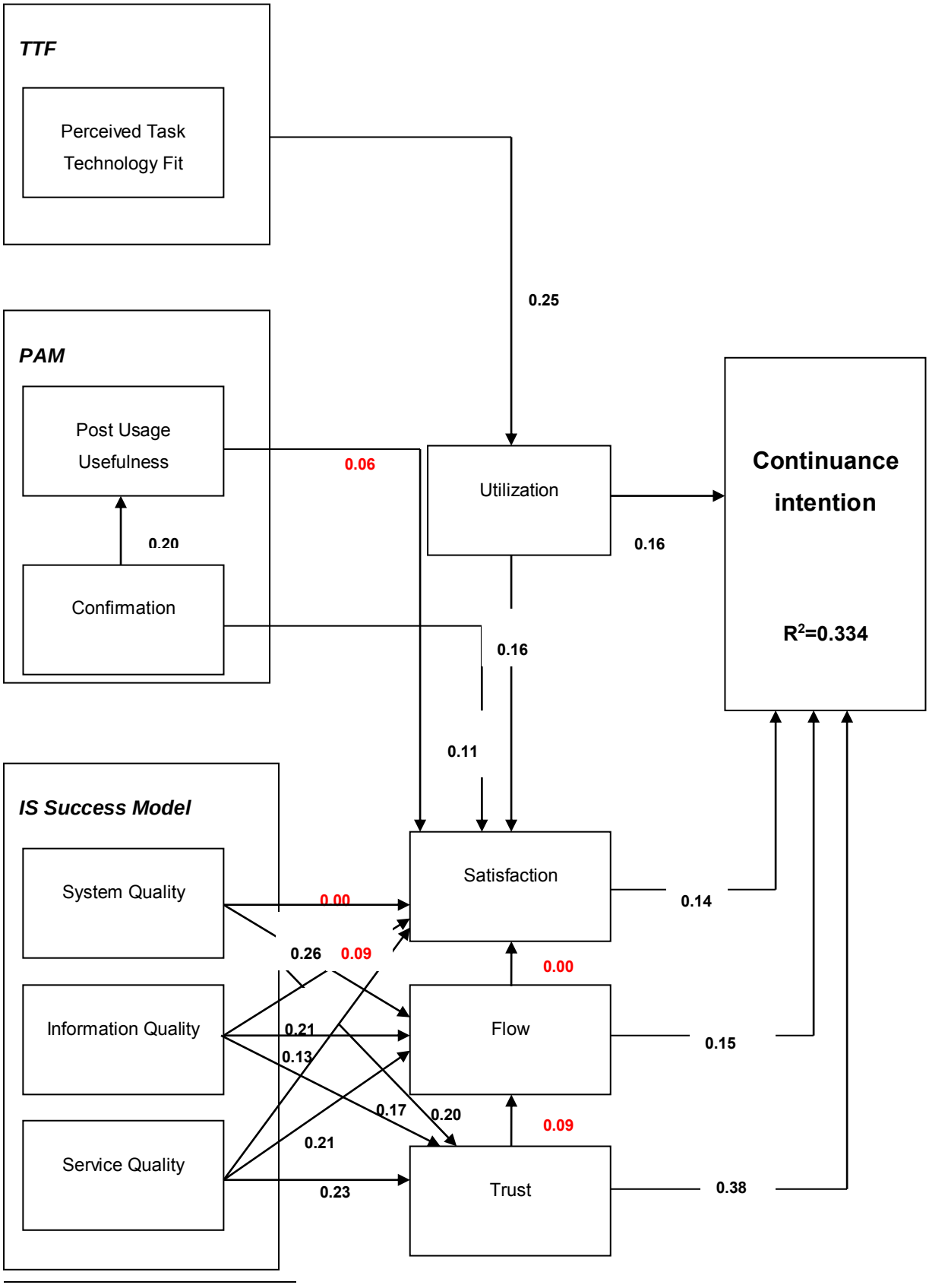
Aforementioned in chapter four, in table 4.6, the researcher noted some evaluation criteria for the structural model. To recap, a common yardstick used in the assessment of a structural model is the coefficient of determination (R^2 value), which is a measure of the structural model's predictive accuracy and is determined as the squared correlation between a dependent construct's actual and predicted values (Hair et al. 2014b). The coefficient symbolizes the independent latent variables collective effect on the dependent latent variable. Given that the coefficient is the squared correlation of actual and predicted values, it signifies the quantity of variance in the dependent

[87] P-value is the approximated likelihood of rejecting the null hypothesis of a study's question when that hypothesis is true.
[88] Critical values for two-tailed tests are 1.65 (significance level = 10%), 1.96 (significance level =5%), and 2.57 (significance level=1%).

construct explained by all the independent constructs connected to it. Aforesaid in chapter 4, the R^2 value weighs on a scale of 0 to 1, and upper levels suggest higher levels of predictive accuracy. To gauge the levels of R^2 values, Hair, Ringle, & Sarstedt (2011) and Henseler, Ringle, Sinkovics (2009) posit an estimate rule of thumb that R^2 values of 0.75, 0.50 or 0.25 for dependent latent variables can be respectively interpreted as substantial, moderate or weak. Nonetheless, Hair et al. (2014b) note that this yardstick is cautionary to interpretations across disciplines. To illustrate this, these scholars state that R^2 values of 0.20 are deemed high in disciplines such as consumer behaviour, whereas disciplines such as marketing, researchers expect higher values of 0.75 and over.

In this study, an R^2 of 0.334 was realized for the dependent variable. As such, it could be interpreted as a relatively high variance score within its research stream- consumer behaviour towards technology. The structural model in fig 5.2 depicts the model, path coefficients, and the model's R^2.

Fig 5.2 .Structural Model[89]



[89] *Note: Path coefficients presented in red are the insignificant relationships.*

Step 4: Effect Size F^2

Beyond the evaluation of the R^2 value of the dependent construct, the fluctuation in the R^2 value of the dependent construct, excluding an independent construct from the model could be used to assess the substantive impact of the omitted construct on the dependent construct (Hair et al. 2014b). This approach is called the F^2 effect size. To interpret the F^2 values, recall from chapter 4, Cohen (1988) presents the following guidelines: 0.02, 0.15, and 0.35, respectively signify, small, medium, and large effects of the independent latent variable. The results of the effect sizes for the study's model are presented below in table 5.27.

Table 5.27 F^2 Effect Sizes for direct effects on dependent variable

Independent Variables	Dependent Variable CONT	Effect Size
UTL	0.02	Small
TRUST	0.12	Medium
FLOW	0.02	Small
SAT	0.01	N.S

Step 5: Examination of the predictive relevance Q^2 and q^2 effect sizes

Further to assessing the size of the R^2 values as a condition of predictive accuracy, Hair et al (2014b) suggest that researchers should also assess Stone-Geisser's Q^2 value (Geisser, 1974; Stone, 1974). This is because the Q^2 value reveals the model's predictive relevance. The Q^2 value is obtained by running the blindfolding function in SMART-PLS for a given omission distance D. Blindfolding is a sample recycle method that exempts every dth data point in the dependent construct's indicators and approximates the parameters with the leftover data points (Chin, 1998b; Henseler et al., 2009; Tenenhaus et al. 2005). In essence, blindfolding is based on an iterative process that runs until every data point has been excluded and the model re-evaluated, and it is utilized for dependent constructs that possess a reflective measurement model specification.

In this study, the blindfolding process was run and the results are presented below in table 5.28. Only the results of the four independent constructs that were hypothesized to directly influence the dependent construct are presented, as a key objective of this study was to identify the determinants of user continuance intention towards M-pesa. The results unexpectedly reveal that

only *trust* amongst the hypothesized determinants (utilization, satisfaction, and flow) has a predictive relevance on continuance intention.

Table 5.28 Results of Predictive Relevance

Independent Variables	Path Coefficient	F2 Effect Size	Q2 Predictive Relevance
UTL	0.16	0.02	0.01
TRUST	0.38	0.12	**0.10**
FLOW	0.15	0.02	0.00
SAT	0.14	0.01	0.01

5.15 Post-Hoc Analysis

Typically, PLS-SEM analysis is employed to identify the relative value of constructs in the structural model by revealing estimates of the direct, indirect, and summated relationships. This was evaluated in the preceding section of this thesis. Beyond this, in this section, the researcher first conducts a PLS-SEM importance-performance matrix analysis (IPMA). IPMA extends the results of PLS-SEM by accounting for the performance of each construct (Fornell, Johnson, Anderson, Cha, & Bryant, 1996; Hock, Ringle, & Sarstedt, 2010; Voelckner, Sattler, Hennig-Thurau, & Ringle, 2010). The extension draws on the PLS-SEM estimates of the path model's associations and provides a new dimension to the analysis that factors the latent variables' average values. For a given dependent latent variable signifying a key latent construct in the analysis, IPMA compares the structural model's total effect (importance) and the average values of the latent variable scores (performance) to underline notable areas for enhancement of managerial action. As such, inference of the results can be made on two levels (i.e., importance and performance), which are crucial to prioritize managerial actions (Hair et al. 2014b). Second, the researcher tests the model for mediating relationships amongst the constructs. This test is necessitated because a significant mediator variable is likely to absorb a cause-effect relationship. Thus, the assessment of mediating relationships facilitates a clearer understanding of the underlying associations between the dependent construct and independent constructs.

Third, a test for moderators is conducted amongst the constructs in the study's model. Moderating variables are those that affect the path and strength of the association between an independent variable and a dependent variable. Moderating effects occur when the cause of an independent variable on a dependent variable relies on the value of a third variable that moderates the

relationship. Moderators are similar to mediators save for moderating variables do not depend on the predictor variables (Hair et al. 2014b, p.258). Again, the evaluation of possible moderating relationships will provide a clearer understanding of the relationships between the dependent and independent constructs.

5.15.1 IPMA

To execute an IPMA, target construct must be identified. Consequently, to complete an IPMA of a given construct, the total effect, and performance value are required (Hair et al. 2014b, p. 207). Thus, the researcher proceeds to first obtain the total effects from the PLS path model estimation performed on the study's model. The results are presented below in table 5.29.

Table 5.29 IPMA Path Model and Total Effects

Constructs	Direct Effect on Continuance	Indirect Effect on Continuance	Total Effect [90] on Continuance
TTF	Not Hypothesized	0.57	0.57
PUU	Not Hypothesized	0.19	0.19
CONF	Not Hypothesized	0.45	0.45
SYSQ	Not Hypothesized	1.22	1.22
INFQ	Not Hypothesized	1.23	1.23
SERVQ	Not Hypothesized	1.33	1.33
UTL	0.16	0.32	0.48
SAT	0.14	0.14	0.28
FLOW	0.15	0.15	0.30
TRUST	0.38	0.62	1.00

Following the generation of direct, indirect, and total effects of the latent variables on continuance, to obtain the performance values of the latent variables in PLS and make the results similar across diverse scales, a performance scale of 0-100 is utilized. On the scale, 0 indicates the lowest performance, while 100 is the highest performance (Hair et al. 2014b, p.209). To rescale the latent variable to acquire index value, the following calculation needs to be executed:

A subtraction of the least possible value of the latent variable's scale, (i.e., 2 for a scale of 1-7) from an approximated data point, and a division of the data point by the difference between the least and greatest data point of the latent variable scale (i.e., 6-3 for a scale of 1-7):

[90] Total effects are derived from the PLS path model estimation, with the formula: direct effect + indirect effect (Hair et al.2014b. p. 208).

$$Y_i^{\text{Rescaled}} = \frac{(Y_i - \text{Least Scale [Y]})}{(\text{Greatest Scale [Y]} - \text{Least Scale [Y]})} \cdot 100$$

Y_i symbolizes the *ith* data point (e.g., i=3 in view of the latent variable score of the third observation in the data set) of a given latent variable in the PLS path model (Tenenhaus et al. 2005; Hock et al. 2010). This formula arrives at rescaled latent variable scores on a scale of 0-100. The mean value of the rescaled score of all latent variables generates the index score of their performance, reflected on a scale of 0-100, with the higher scores suggesting a latent variables superior performance. That said, importance and performance scores were calculated for each latent variable in this study. The results are presented below in table 5.30, and show that all factors (antecedent and determinants) of continuance intention have an importance level in influencing user continuance intention, as their importance scores are all above 0. However, amongst the determinants of continuance intention, importance levels are greater than their performance levels, except for flow which has par significance on both areas.

Table 5.30 IPMA- Importance and Performance scores

Constructs	Importance	Performance
TTF	0.57	0.00
PUU	0.19	0.04
CONF	0.45	0.00
SYSQ	1.22	0.00
INFQ	1.23	0.00
SERVQ	1.33	0.00
UTL	0.48	0.06
SAT	0.28	0.12
FLOW	0.30	0.30
TRUST	1.00	0.20

5.15.2 Mediator Analysis

Mediation is a crucial issue in the context of PLS-SEM, and while this study's hypotheses, consistent with extant studies, did not hypothesize mediating relationships amongst the constructs under scrutiny, the researcher considers it a duty to test possible underlying relationships that may enhance future research in the continuance stream. As such, a post-hoc analysis was executed to test the model for any underlying mediating relationships amongst the variables. As an abstraction, mediation examines the theoretically recognized direct path association between two

variables (i.e., path X1 and X3) and another theoretically related variable (i.e., X2), that circuitously provides information on the direct effect via it circuitous effect (i.e., from X1 to X3 by X2) . Thus, the circuitous association by X2 affects the direct association from X1 to X3 in a mediator model. In principle, a variable is a mediator when it meets the following conditions (Baron & Kenny, 1986):

(i) Differences in the levels of the predictor variable account significantly for the variations in supposed mediator. (ii) Differences in the mediator account significantly for the variations in the criterion variable. (iii) A control in paths X1→X3 and X2→X3 would significantly change a previously significant association between the predictor and criterion variables.

To examine possible mediating relationships within the study's research model, the researcher adopts the below depicted mediator analysis procedure proposed by Hair et al. (2014b). The results of the mediation tests are presented below in table 5.31.

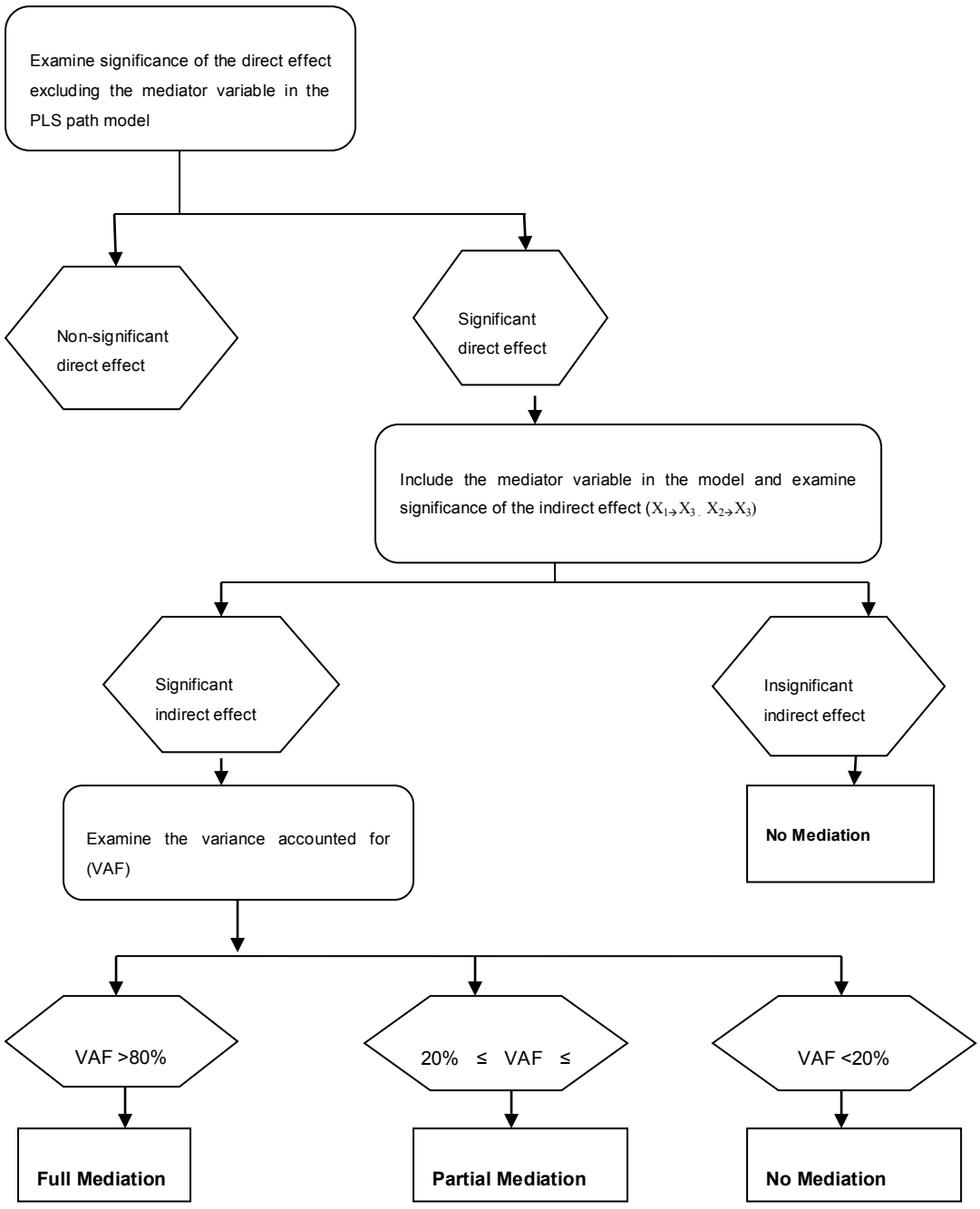


Fig 5.3 Modus Operandi for Mediation Analysis: adopted from Hair et al. 2014b

Table 5.31 Results of Mediation Analysis

Mediating construct	Hypothesized Path	Constructs	Path Coefficient	Product of paths towards criterion variable	Sig	Conclusion
UTL	TTF→UTL→CONT	TTF →CONT	0.126	0.257*0.345 = 0.08	n.s	No mediation
		TTF→ UTL	0.257			
		UTL→ CONT	0.345			
SAT	PUU→SAT→CONT	PUU→CONT	0.123	0.129*0.276 = 0.03	n.s	No mediation
		PUU→SAT	0.129			
		SAT→CONT	0.276			
	CONF→SAT→CONT	CONF→ CONT	0.222	0.247*0.276 = 0.06	n.s	No mediation
		CONF→SAT	0.247			
		CONF→CONT	0.276			
	SYSQ→SAT→CONT	SYSQ→ CONT	0.248	0.148*0.277=0.04	n.s	No mediation
		SYSQ→SAT	0.148			
		SAT→CONT	0.277			
	INFQ→SAT→CONT	INFQ→CONT	0.186	0.210*0.276=0.05	n.s	No mediation
		INFQ→SAT	0.210			
		SAT→CONT	0.276			
	SERVQ→SAT→CONT	SERV→CONT	0.215	0.234*0.277=0.06	n.s	No mediation
		SERVQ→SAT	0.234			
		SAT→CONT	0.277			
TRUST	SYSQ→TRUST→ CONT	SYSQ→CONT	0.248	0.327*0.50=0.16	Sig < VAF 20%	No mediation
		SYSQ→TRUST	0.327			
		TRUST→CONT	0.50			
	INFQ→TRUST→ CONT	INFQ→CONT	0.186	0.300*0.499=0.14	Sig < VAF 20%	No mediation
		INFQ→TRUST	0.300			
		TRUST→CONT	0.499			
	SERVQ→TRUST→CONT	SERVQ→CONT	0.215	0.348*0.499=0.17	Sig < VAF 20%	No mediation
		SERVQ→TRUST	0.348			
		TRUST→CONT	0.499			
FLOW	SYSQ→FLOW→ CONT	SYSQ→CONT	0.248	0.424*0.346=0.14	Sig < VAF 20%	No mediation
		SYSQ→FLOW	0.424			
		FLOW→CONT	0.346			
	INFQ→FLOW→ CONT	INFQ→CONT	0.186	0.383*0.348=0.13	Sig < VAF 20%	No mediation
		INFQ→FLOW	0.383			
		FLOW→CONT	0.348			
	SERVQ→FLOW→CONT	SERVQ→CONT	0.215	0.388*0.347=0.13	Sig < VAF 20%	No mediation
		SERVQ→FLOW	0.388			
		FLOW→CONT	0.347			

5.15.3 Moderator Effect

Moderator effect is present when the effect of an independent latent variable on a dependent latent variable is reliant on the significance of a third variable that moderates the relationship (Hair et al. 2014b, p.279). To assess possible moderating effects in the study's research model, the product indicator approach[91] in PLS was employed. The researcher tested independent latent variables which had direct hypothesized paths to the dependent latent variable, and between themselves. The results reveal that amongst the tested potential moderators, only *flow* was found to moderate the relationship between a user's satisfaction and continuance intention with M-pesa. The results generated in PLS are presented below in table 5.32.

Table 5.32 Moderator Effect

Moderating variable	Interaction Term	Path Coefficient	T-value	Significant Moderating effect
UTL	SAT*UTL → CONT	0.0396	0.8140	No
FLOW	FLOW*SAT → CONT	0.1295***	2.5455	Yes
TRUST	FLOW*TRUST→ CONT	-0.0421	0.6535	No

5.15.4 ANN

Aforesaid in chapter 4, because SEM only detects linear relationships, it is susceptible to over-simplification of the complexities of intention to continue use of a technology. Hence, to counteract this slack, a SEM–ANN approach was employed because ANN has capacity to detect non-linear relationships void of distribution assumptions such as normality, linearity or homoscedasticity (Leong, Hew, Tan, & Ooi, 2013). By employing ANN, this study stands to identify intricate linear and non-linear relationships between the post-adoption factors and user continuance intention. The significant determinants of continuance intention from SEM were used as the input units for the ANN. The four hypothesized variables in the study's model as

[91] Is a technique that involves multiplying the indicators of the moderator with the indicators of the independent variable to determine a measurement model of the interaction term (Hair et al. 2014b. p.280).

determinants of user continuance intention were found to be significant in SEM analysis. These variables were: utilization, satisfaction, trust, and flow.

For the ANN analysis, multi-layer perceptron training algorithm was engaged to train the neural network. To negate over-fitting of the ANN model, cross-validation was conducted: where 70% of the data was used for network training and the outstanding 30% was used to evaluate the calculation efficiency of the trained network. Thereafter, a pilot network was assessed using one to ten concealed nodes (Morris, Greer, Hughes, & Jeff Clark, 2004; Sexton, Johnson, & Hignite, 2002). This is because there are no heuristic means for defining the number of concealed nodes in an ANN. Thus, this study utilized networks with six concealed nodes that were deemed suffieciently intricate to map the data sets void of more inaccuracy to the ANN model. The study's ANN thus consists of four predictors, six hidden nodes, and one output variable. Results of the model summary for training and testing are presented in Table 5.33. Further, sensitivity checks were computed by the average weight of the input variables in predicting the output for the networks. The results are presented in table 5.33.

Table 5.33 Model Summary

% Incorrect predictions for categorical dependents	Training	Overall Percent Correct Training	Testing	Overall Percent Correct Testing
CONT 1	80.3%	76.8%	65.8%	72.7%
CONT 2	81.2%		80.0%	
CONT 3	69.4%		75.0%	
CONT 4	76.4%		70.0	

The user continuance intention factor assesses the difference in level of the ANN's predicted value changes for values of the independent variables. The values presented in table 5.33 are importance and normalized importance values. The independent variable importance analysis executes a sensitivity analysis, which calculates the significance of each predictor in determining the ANN. The analysis is grounded in the collective training and testing samples or only on the training sample where a testing sample is absent. The results of the importance analysis are presented in Table 5.34. All variables (utilization, satisfaction, trust, and flow) in the model are found to be important determinants of continuance intention; however, items of trust and utilization emerged as more important determinants of continuance intention.

Table 5.34 Importance of Determinants

Variable	Items	Importance	Normalized Importance (%)
Utilization	UTL 1	.125	100%
	UTL2	.067	53.1%
	UTL3	.092	73.1%
Satisfaction	SAT1	.056	44.7%
	SAT2	.066	52.7%
	SAT3	.043	33.9%
Flow	FLOW1	.068	54.0%
	FLOW2	.061	48.5%
	FLOW3	.073	58.1%
	FLOW4	.051	40.6%
Trust	TRUST1	.082	65.1%
	TRUST2	.093	74.0%
	TRUST3	.125	99.9%

The results on the ANN analysis is consistent with those from the PLS regression test. All hypothesized determinants in the study's model were confirmed. This validates the selected constructs as determinants of continuance intention.

5.16 Chapter Conclusion

This chapter has presented the analysis of the data obtained for the study. The response rate, data treatment techniques, participant demographic profiles, analysis of measurement and structural model were presented. Three statistical packages were used for the data analysis: SPSS, SEM-PLS, and ANN. SPSS was employed for the descriptive and exploratory factor analysis of the data, SEM-PLS was used to assess the measurement and structural model of the data, whilst ANN was used to verify the results generated in SEM-PLS. Following the assessment of the structural and measurement model, the researcher conducted some post-hoc tests on the data, namely: IPMA, mediation, and moderation tests. These tests were conducted to provide additional insights to the study's results. Efforts to validate the results of the structural model analysed with PLS through ANN emerged successful, as the results were consistent across the statistical software.

The next chapter presents interpretations of the findings. The results presented in this chapter will be explained in light of theoretical discussions and literature reviews.

6. DISCUSSION AND CONCLUSION

"If you can't explain it simply, you don't understand it well enough"~ ***Albert Einstein***

In the previous chapter, the data collected for this study was analysed and the results obtained were presented. This chapter presents discussions around the findings of the study and the conclusion of the thesis. It is divided into five sections: Section 6.1 presents discussions on the answers to the RQ's of this study. Section 6.2 discusses the contributions of this study to theory and practice. Section 6.3 presents the strengths and limitations of the study. Section 6.4 offers directions for future research in the context of user continuance intention. Section 6.5 concludes the chapter and thesis.

6.1 Answers to RQ 1 and 2

The RQ's in this study sought to identify the antecedents and determinants of user continuance intention towards M-pesa amongst individual users in Kenya. To do this, the researcher examined the literature to identify potential antecedents. Consequently, the identified constructs from the literature were operationalized and used to inform the study's model development. The selected factors were posited to have relationships, and the factor associations were framed and tested in form of hypotheses. Cross-sectional survey with structured questionnaires was the instrument of data collection. To test hypothesized relationships, data was submitted to quantitative methods of multivariate data analysis. Discussions on the answers to the RQ's: (i) What are the antecedents of user continuance intention towards M-pesa; and (ii) What are the determinants of user continuance intention towards M-pesa, are presented respectively next.

6.1.1 RQ 1- The Antecedents of User Continuance Intention towards M-pesa in Kenya.

To answer RQ one, several factors were identified within the literature. Particularly, from IS and psychology literature. To minimize random selection of factors for investigation and for theoretical coherence, the researcher adopted a parochial approach. The base model- PAM for continuance with a technology, proposed by Bhattacherjee (2001a) and factors from an updated model (Bhattacherjee et al. 2008) were selected. To complement this model, the researcher

identified censure within the literature on the PAM, and potential factors in other models that could compensate for the PAM's shortcoming. The researcher focused on two weaknesses of the PAM: (i) unaccountability for tasks (D'Ambra et al. 2013), and (ii) lack of actionable guidance for practitioners (Benbasat, 2010). To address these deficiencies, the researcher sought established theoretical frameworks within the reviewed literature, and identified a factor (task-technology fit) from TTF model to fill the gap on accountability of tasks. Conversely, to address the gap on actionable guidance for practitioners, the researcher transcends the behavioural beliefs captured in the PAM, and identifies other beliefs such as control, object-based, and attitude to complement the PAM. Specifically, the researcher identified factors (system quality, information quality, and service quality) from the IS success model as inclusions of object-based beliefs. For control-based beliefs, (utilization) was adopted within the selected- TTF model and an additional factor (flow) selected from flow theory, and for attitude: the trust construct was selected from trust theory. Collectively, these factors were modelled as antecedents of user continuance intention towards M-pesa. The findings of the associations amongst the constructs are discussed next.

6.1.1.1 Antecedents from the PAM

Constructs from the original and updated PAM were included in the study's model and are presented below in table 6.1.

Table 6.1 PAM constructs

Construct	Hypothesized Relationships	Result
Post-usage Usefulness	A[92] Post-usage usefulness → Satisfaction	Unsupported
Confirmation	A Confirmation → Post-usage Usefulness	Supported
	A Confirmation → Satisfaction	Supported
Satisfaction	D[93] Satisfaction → Continuance Intention	Supported

The constructs from the PAM as presented in table 6.1 are post usage-usefulness, confirmation, satisfaction, and continuance intention. Three of these four are independent variables and the last (continuance intention) is the dependent variable of this study. Amongst the constructs from the PAM, an interesting result was discovered. However, before presenting this finding, the

[92] **Note**: An 'A' preceding the hypothesis signifies an antecedent postulation.
[93] a 'D' preceding the hypothesis signifies a determinant postulation, and the findings are explained in the determinant section.

researcher recapitulates the core postulations of the PAM. The PAM holds that a user's continuance with a technology is reliant on a cognisant or intended decision to operate in a given way (Bhattacherjee & Lin 2014). These decisions are averred to require two inputs: (i) expected benefits from future use, such as the usefulness of the technology in completing a task, and (ii) aggregated judgments of the result of prior use, which is captured in the user satisfaction construct (Bhattacherjee, 2001a). Reverting to the results of this study, three relationships were hypothesized amongst the PAM factors (post-usage usefulness → satisfaction, confirmation → Post-usage usefulness, and confirmation → satisfaction). Only two of these three hypotheses had significant path relationships. The first hypothesis (post-usage usefulness → satisfaction) was found to be non-significant. This occurrence is unexpected and inconsistent with the extant literature reports with arguments that perceptions of usefulness is a salient and robust predictor across temporal phases of technology use, in pre-acceptance and post-acceptance eras (e.g., Bhattacherjee, 2001a; Bhattacherjee et al., 2008; Lee et al. 2007; Recker, 2010; Lin et al. 2014). While unexpected, this finding has also been reported in an extant study (e.g., Sorebo & Eikebrokk, 2008). A possible explanation for this occurrence could be that user satisfaction with M-pesa unfurls autonomously of the varying levels of perceived usefulness. This does not suggest that satisfaction is not associated with usage experience but could mean that: (i) satisfaction reflects a pro tem transaction specific affect related to the past usage experience, (ii) post-usage usefulness reflects a robust, transaction-invariant confidence based on past usefulness perception. Thus, it could be that prior to the data collection phase of this study, most of the respondents did not experience a fulfilling interaction with M-pesa, even though they had erstwhile, and this weighed on their response to the satisfaction item in the survey instrument.

The path relationship between confirmation → post-usage usefulness was found to be significant. This finding is consistent with arguments that confirmation of expectation stands to increase user perception of the usefulness of a technology-enabled service, whilst disconfirmation stirs negative perceptions towards the technology (Bhattacherjee, 2001a; Bhattacherjee et al. 2008). Thus, M-pesa users within the surveyed sample concur that their experience with using the service confirms anticipations, and enables for a self-evaluation of usefulness of the service.

The last path relationship posited based on the PAM was confirmation → satisfaction, and it was found to be significant. Again, this finding is consistent with extant literature findings (e.g., Sursala et al. 2003; Lin, Wu, & Tsai, 2005; Limayem & Cheung, 2007) that confirmation positively influences satisfaction with a technology use because it highlights recognition of the

expected gains (e.g., sending and receiving money faster, efficiently, and cost effectively) of the technology's use (Bhattacherjee, 2001a; Bhattacherjee et al. 2008; Bhattacherjee & Lin, 2014). This finding grants the relevance of the surveyed samples validation of expectations of M-pesa's capabilities as an influencer of their satisfaction with the service.

6.1.1.2 Antecedents from the TTF

Table 6.2 Adopted constructs from the TTF

Construct	Hypothesized Relationships in this study	Results
Perceived Task-Technology Fit	[A] TTF→Utilization	Supported
Utilization	[A] Utilization→ Satisfaction	Supported
	[D] Utilization → Continuance Intention	Supported

Note: relationships with a '**D**' indicator are not discussed in this section.

Factors from Goodhue and Thompson's (1995) TTF model are presented in table 6.2, and included perceived task-technology fit and utilization. They were adopted as compensation for censure of the PAM on unaccountability for tasks. A user of M-pesa's perception of TTF was hypothesized to influence his or her utilization of the service.

A path relationship between TTF and Utilization was tested and found to be significant. This finding is also consistent with extant studies (e.g., Larsen et al. 2009; Lin, 2012; D'Ambra et al. 2013) that where a user of a technology is convinced that a technology enabled-product or service is relevant for the execution of his or her task: in this study (sending money and receiving money), and that he or she possesses the ability to use it, then he or she will be inclined to utilize it. Thus, the surveyed sample within this study validate that their perception of M-pesa's functionalities to facilitate their monetary transaction needs, influences their use of the service. The path relationship between utilization and satisfaction is supported in this study, and is consistent with the extant literature (e.g., Delone & McLean, 1992; Larsen et al. 2009; Chang et al. 2015). This finding suggests that the surveyed users of M-pesa identify with a feature(s) (deposit or withdrawal function) of M-pesa that facilitates their task requirements (monetary transactions) and are pleased with it.

6.1.1.3 Antecedents from the IS Success Model

Table 6.3 Adopted constructs from the IS success Model

Construct	Source of Construct	Hypothesized Relationships in this Study	Result
System Quality	DeLone & McLean (2003)	[A] System Quality → Satisfaction	Unsupported
		[A] System Quality →Flow	Supported
		[A] System Quality →Trust	Supported
Information Quality	DeLone & McLean (2003)	[A] Information Quality → Satisfaction	Unsupported
		[A] Information Quality → Flow	Supported
		[A] Information Quality → Trust	Supported
Service Quality	DeLone & McLean (2003)	[A] Service Quality → Satisfaction	Supported
		[A] Service Quality → Flow	Supported
		[A] Service Quality → Trust	Supported

Three factors were adopted from the DeLone and McLean's (2003) success model, and are presented above in table 6.3. Amongst the nine relationships hypothesized, most were supported except two. The path relationship between SYSQ → Satisfaction, and INFQ → Satisfaction were unsupported.

The hypothesized path relationship between system quality and satisfaction followed causal logic that the quality of a system characterized by ease of use, reliability, speed, good navigation, and an appealing interface, as perceived by a user of M-pesa would influence his or her satisfaction because a poor system will undermine a user's experience with the system, thus minimizing satisfaction (Zhou, 2013). This unexpectedly did not hold true. A possible reason for this occurrence could be that the surveyed users of M-pesa do not associate system appearance, ease of use, and easy navigation with substantial gains that can be derived from M-pesa use. This finding could also result from a lack of par alternative services to benchmark against M-pesa's systems quality. Recap, M-pesa is the premiere and leading vendor of MMS in Kenya and globally, thus, the systems quality it presents to its users is likely the best option available in the market. This circumstance could have left users indifferent about the systems quality presently offered. An unsupported relationship between system quality and satisfaction, although rare, is also reported in an extant study (e.g., Alhendawi & Baharudin, 2014).

The second hypothesized path relationship based on a factor from the IS success model (DeLone & McLean, 2003) was SYSQ → Trust, which was supported. This finding is consistent with extant studies (e.g., Zhou, 2013; Vance et al. 2008). The support for this relationship buttresses belief that a vendor's claim and ability to instil perceptions in users that its system is characterized

by ease of use, quick response time, reliability, speed, and good navigation, is essential for a business exchange relationship. Participants' response to this study's survey suggests that the M-pesa vendor's ability to serve its users with a quality system influences users' willingness to be vulnerable with the vendor, which is the core theme of trust (Hardin, 1993, p.507).

The third hypothesized path relationship drawn on the IS success model (Delone & McLean, 2003) was SQ→Flow, and it was supported. This finding is also consistent with extant literature postulations that characteristics of a quality system are desired to maximize a user's experience with a system by captivating the user while executing a system-aided target task (Zhou, 2013; Guo & Poole, 2009; Finneran & Zhang, 2003). The finding of a path relationship between SQ→ Flow suggests that attributes of M-pesa's system quality (e.g., ease of use, navigation, graphics, etc) influences the challenges and skills of most of its users while engaging with M-pesa. It further suggests that the surveyed M-pesa users acknowledge a link amongst their task, skills, and the technology artefact.

The Fourth hypothesized path relationship from the IS success model (Delone & McLean, 2003) was INFQ→ SAT, and was unsupported. This was an unexpected and inconsistent finding with most extant literature (e.g., Delone & McLean, 1992; 2003; Seddon & Yip, 1992; Wixom & Todd, 2005; Chiu et al. 2007), that information received from a system that embodies the characteristics such as: accuracy, timeliness, and completeness, currency, and usability (DeLone & McLean, 1992; 2003), will be well received by the user and would leave the user satisfied. However, a similar study (e.g., Zhou, 2013) that tested the influence of information quality on satisfaction also found an unsupported relationship. A possible explanation for this occurrence could be that the effect of information quality on satisfaction is a mediated one. However, while efforts were made to conduct mediating tests in the post-hoc analysis phase of this study, no mediating effect was found between information quality and the hypothesized variables in the model. Perhaps its influence on satisfaction could be mediated by a variable that was not hypothesized or included in the study's model.

The fifth hypothesis drawn on the IS success model is the INFQ→Trust path relationship, and is supported in this study. Information quality is attributed to a systems offering of information in view of timeliness, completeness, accuracy, currency (Delone & McLean, 1992; 2003), and is posited in extant studies (e.g., Zhou, 2013) to engender trust. That said, the result of this relationship is consistent with findings in the extant literature (Nicolaou & McKnight, 2006; Zahedi & Song, 2008; Zhou, 2013). Users of M-pesa's expectation of information quality (e.g.,

account balances) are based on trust, which is the key element in the preservation of exchange relations (Blau, 1964). The results of this study suggest that the surveyed users of M-pesa associate their vulnerability with M-pesa to the vendor's ability to provide accurate account balances and quick response time to their queries.

The sixth hypothesized path relationship: INFQ→Flow was also supported in this study. Another consistency with the extant literature that a feeling of enjoyment while using a technology-enabled service is likely to be realized if the user perceives that the information he or she is provided with is of high quality (Zhou, 2013; Zhou, 2014; Cheng, 2014). A positive relationship reported by the surveyed users is testament that a user's skills (e.g., read and utilize the information for a transaction) will likely surpass the challenges (e.g., a need to scrutinize information from M-pesa) if the information from M-pesa is accurate, timely, complete, and current.

The seventh hypothesized path relationship: SERVQ→SAT was found to be significant. This finding is consistent with the extant literature (e.g., Deng, Lu, Wei, & Zhang, 2010; Kuo, Wu, & Deng, 2009). Recap, service quality refers to the support a user receives from a vendor (Delone & McLean, 1992), and is characterized by empathy, reliability, personalization, responsiveness, and assurance (DeLone & McLean, 1992; Zhou, 2013). On this note, M-pesa users require for example: quick response time to queries on account balances. Support for the hypothesized relationship: SERVQ→SAT implies that the surveyed users attribute characteristics of service quality as influencers of their satisfaction with M-pesa. In essence, the findings of this study show that the vendor's ability to properly facilitate use of their service influences user satisfaction with the service.

The eighth IS success model based hypothesized path relationship is SERVQ→ Trust, which also received support in this study. This hypothesis is again consistent with extant literature reports (e.g., Gefen, 2002; Liu, Guo, and Lee, 2011). This finding implies that the service level agreements between the M-pesa vendor and users are considered by the surveyed users, a key ingredient for a successful exchange relationship. As such, the credibility of the M-pesa vendor weighs on its ability to demonstrate competence and goodwill.

The ninth hypothesized path relationship drawn on the IS success model is SERVQ→Flow, and it is validated in this study. Indeed a user's perception of system quality influences his or her flow experience. Again, this finding is consistent with reports in the extant literature (Hsu, Chang, & Chen, 2012; Zhou, 2013; Cheng, 2014). Some characteristics of service quality that induce flow

in an M-pesa context are reliability and responsiveness. This study's findings of a positive path relationship between SERVQ→Flow implies that surveyed M-pesa users attribute an experience of reliable connections and responsiveness of M-pesa to feelings of control, focus, pleasure while using the service. Thus, a reliable and responsive service from the M-pesa vendor, enables user control over the M-pesa, and this creates an environment for full-immersion while using M-pesa.

6.1.1.4 Antecedent from Flow Theory

Table 6.4 Adopted construct from Flow Theory

Construct	Hypothesized Relationships in this study	Results
Flow	[A]Flow → Satisfaction	Unsupported
	[D] Flow →Continuance Intention	Supported

A path relationship was not established in this study between users flow with M-pesa and their satisfaction level. Flow is expressed as a holistic sensation that an individual experiences while acting with complete involvement (Csikszentmihalyi & Csikszentmihalyi, 1988). A finding of non-association between flow and satisfaction is counterintuitive and implies that use of M-pesa is not perceived overall as a service that entails a flawless sequence of responses, intrinsic enjoyment, loss of self-awareness, and self-fortification. These positive characteristics of flow were expected to leave the surveyed users of M-pesa satisfied with a compelling experience. Unexpectedly, this finding is inconsistent with the extant literature that a user who is engaged in a machine-interactivity, and experiences intrinsic pleasure, loses consciousness, and feels self-reinforced is likely to emerge from this experience satisfied (Lee, Kang, & McKnight, 2007; O'cass & Carlson, 2010; Zhou, 2013). An explanation for this inconsistent finding could be that the surveyed users' expectations of M-pesa of a persuasive experience has not been met or exceeded.

6.1.1.5 Antecedent from Trust Theory

Table 6.5 Adopted construct from Trust Theory

Construct	Hypothesized Relationships in this study	Results
Trust	[A] Trust →Flow	Unsupported
	[D] Trust →Continuance Intention	Supported

A user's trust in M-pesa influences their flow experience with M-pesa. This conjecture was not established in this study. The researcher argued that trust grants a subjective assurance that users would obtain a superior experience in future, with the belief that a mobile money vendor has capacity, veracity, and goodwill to deliver quality services to them (Zhou, 2013). As such, M-pesa users expect the vendor to provide optimum degree of service to maximize user experience. A lack of support for this relationship is inconsistent with the extant literature (e.g., Wu & Chang, 2005; Zhou et al. 2010), and a rather counterintuitive finding. A possible explanation for this finding suggests that the M-pesa vendor has not unanimously discharged its duties to the surveyed users by showing goodwill and veracity, and in turn, these perceptions have detracted from a gripping overall experience for M-pesa users.

6.1.2 RQ 2- Determinants of User Continuance Intention towards M-pesa

RQ 2 sought to identify the determinants of user continuance intention towards M-pesa in Kenya. The determinants hypothesized in this study included: utilization, satisfaction, flow, and trust. Recap, utilization is a construct from the TTF model (Goodhue & Thompson, 1995). Satisfaction is a construct within the IS PAM (Bhattacherjee, 2001a). Flow is a derived construct from the flow theory (Csikszentmihalyi & Csikszentmihalyi, 1988), and the trust construct is adopted from trust theory (Gefen et al. 2003).

To answer RQ 2, four hypothesized relationships were tested in this study and are presented below in table 6.6.

Table 6.6 Determinants of User Continuance Intention towards M-pesa

Construct	Hypothesized Relationships in this Study	Result
Utilization	Utilization → Continuance Intention	Supported
Satisfaction	Satisfaction → Continuance Intention	Supported
Flow	Flow → Continuance Intention	Supported
Trust	Trust → Continuance Intention	Supported

6.1.2.1 Trust

Amongst the hypothesized determinants of user continuance intention towards M-pesa, all hypothesized determinants were found to be significant predictors of the criterion variable. However, an enthralling finding emerged. Based on the extant literature, satisfaction is posited as the core determinant of user continuance with a technology (Bhattacherjee, 2001a; Bhattacherjee et al. 2008). This report meets contention based on the findings of this study, where a user's **trust** in M-pesa is discovered to be a stronger determinant of continuance intention than satisfaction. The discovery of the predictive power of trust surpassing that of satisfaction is noteworthy, and a plausible explanation could be that: first, despite satisfactions influence on continuance with M-pesa, the surveyed users are only content with some and not all of the functionalities of M-pesa for the execution of their transaction tasks. However, given that M-pesa leads the mobile-money service market in Kenya and globally, it is the best option available to the surveyed users. In essence, M-pesa presently delivers a service level that caters for users monetary transaction needs but users desire higher service levels from the M-pesa vendor. Second, the aspect(s) of M-pesa's functionality that users have identified with has instilled fair perceptions of the M-pesa vendor's ability to keep its promises. That said, an influence of trust on user continuance is consistent with the extant literature (e.g., Benamati et al. 2010; Luo et al. 2010; Zhou, 2013), that a vendor's demonstration of the necessary capacity and gen to discharge their responsibilities will foster patronage, as the service facilitates the accomplishment of a user's target task.

6.1.2.2 Utilization

Utilization emerged as the second strongest predictor of user continuance intention towards M-pesa in Kenya. This finding was also unexpected as its predictive power surpasses that of satisfaction, which is reported broadly as the strongest predictor of continuance intention in the extant literature (e.g., Bhattacherjee, 2001a; Bhattacherjee, et al. 2008; Zhou, 2013). While unexpected, this finding could stem from logic that: (i) users embrace selected facets of a given technology for execution of their tasks (Larsen et al. 2009), and given that M-pesa facilitates both withdrawals and deposits of cash, the surveyed users could have preference for just one aspect of the service. A one-sided preference of technology-enabled service offerings is likely to influence the overall satisfaction with the service. Thus, responses to utilization levels of a given facet of M-pesa could have outweighed responses to overall levels of satisfaction, increasing its predictive power over satisfaction. (ii) Given that M-pesa holds the largest mobile money market share in

Kenya and likely the best available service amongst alternatives, this circumstance could restrict users from switching services despite below optimal levels of satisfaction. In essence, respondents' intention to continue using M-pesa is driven by its ability to facilitate some of their transaction needs, despite a lack of complete fulfilment of their expectations from the service. That said, an influence of utilization on continuance intention is consistent with the extant literature (e.g., Larsen et al. 2009; Davis & Venkatesh, 2004) that an individual will continue to use facets of a technology that aids execution of a given task and refrain from facets that are not instrumental for their goals.

6.1.2.3 Flow

Flow emerged as the third strongest predictor amongst the determinants in this study, and also unexpectedly surpassed the predictive power of satisfaction. The finding of flows influence on user continuance intention with M-pesa reveals that the surveyed users recognize skills and challenges as relevant factors when using M-pesa. Users have insinuated that apathy and anxiety are considerations in their experience while using M-pesa because they need to possess the knowledge and skills required using the service. This finding suggests that a seamless operation, immersive and enjoyable experience influences users of M-pesa to continue use of the service, and would influence them to re-live the experience. Further, flows influence on continuance intention reinforces opinions of Kim et al. (2007) that users of technology-enabled services are not only utilitarian-oriented but also appreciate a pleasurable engagement. Flows influence on continuance intention is therefore consistent with the extant literatures stance that a balance of skills and challenges will enable an experience of flow (Richard & Chandra, 2005; Luna et al. 2003; Zhou, 2013).

6.1.2.4 Satisfaction

Satisfaction emerged as the least strong predictor of continuance intention towards M-pesa. Afore-noted, this is an unexpected finding that is inconsistent with reports in the literature. In the consumer behaviour literature, satisfaction is considered the cornerstone to building and retaining a loyal-base of long-term customers (Oliver and Sullivan, 1993), as it reflects a positive attitude of the consumer. In this study, while satisfaction was found to determine user continuance with M-pesa, which is a consistent finding within the extant literature (e.g., Bhattacherjee, 2001a; Kim et al. 2009; Liu et al. 2011; Kuo et al., 2009; Bhattacherjee & Lin, 2014), it emerged as the least

potent predictor. However, a rationale for its lower predictive power ranking amongst the adopted factors could be that: M-pesa's service offering as a whole, do not meet user satisfaction levels. In essence, the surveyed users may be only content with facets (deposit or withdrawal) of M-pesa's functionalities, and expect improvements in other areas. To exemplify this, users of M-pesa could have high satisfaction levels with the functionalities of M-pesa for sending money and lower satisfaction levels for receiving money. Thus, the surveyed users overall rating of satisfaction with service would be reduced.

6.2 Theoretical and Practical Contributions

The core goal of this study is to advance our understanding of the factors that promote or inhibit user continuance intention towards technology-enabled services within developing regions. The findings within this study offer several contributions to theory and practice, and these are summarized in the subsequent sub-sections.

6.2.1 Theoretical Contribution

To advance our understanding of user continuance intention, the researcher integrated factors from two theories and three models to explain this phenomenon. The IS PAM was adopted as the base model for this study, and complementary factors from other models and theories in the literature were identified and integrated to compensate for its shortcomings. The IS PAM comprises factors that exhibit behavioural beliefs, however, this study integrated new perspectives of control beliefs, object based beliefs, and attitude to enhance the belief base of continuance outlook. This action was in adherence to Bhattacherjee et al's. (2008) view: to advance the predictive power of a model that examines human behaviour, supplementary theoretical perspectives and empirical tests are essential to advance the robustness and predictive capacity across a broader range of realms. Factors reflecting behavioural beliefs from the PAM included: post-usage usefulness, confirmation, satisfaction, and continuance intention (Bhattacherjee, 2001a; Bhattacherjee et al. 2008). Complementary factors reflecting object-based beliefs included: system quality, information quality, and service quality, were adopted from the IS success model (DeLone & McLean, 2003). Control-based beliefs included: utilization and flow, were adopted from the TTF model and flow theory (Goodhue & Thompson, 1995; Csikszentmihalyi and Csikszentmihalyi, 1988). Last, factors reflecting attitudinal beliefs included:

trust, which was adopted from trust theory (Gefen, 2003). Collectively, the study's model was discovered to hold a predictive power of 33.4%. The integration of beliefs across the aforementioned group has advanced theory in the following ways:

(i) Beyond behavioural based beliefs, other beliefs significantly influence user continuance intention. The inclusion of trust theory was a significant addition to continuance models. An interesting finding emerged from this study, where the influence of trust was the strongest predictor of continuance intention amongst the surveyed sample. It held a greater influence than satisfaction in predicting user continuance. This finding introduces a new perspective that attitudinal beliefs (trust) may be a greater influencer than behavioural beliefs (satisfaction) in predicting continuance intention in a developing world context.

(ii) Two factors within control-beliefs (utilization and flow) were found to be significant predictors of continuance. These control beliefs were found to be the second and third strongest influencer of user continuance intention, surpassing the influence of behavioural belief (satisfaction). This is a novel finding and indicates that a task-technology fit and flow perspective are significant contributions from the TTF model and flow theory to the continuance literature. The consequence of this finding reinforces this study's first theoretical contribution that the potency of behavioural beliefs (satisfaction) is not a superior consistent predictor of continuance intention, and that the strength of satisfactions influence could vary across contexts.

(iii) The flow factor was discovered to influence user continuance intention amongst users of M-pesa, following trust and utilization in predictive strength of user continuance toward M-pesa. Flow is a relatively new concept in the continuance literature and its nomological paths in understanding continuance intention are still being explored. This study's finding of an influence of flow on continuance intention increases credence of its validity in continuance models. Thus, the integration of flow theory- a psychology theory is a valuable integration in advancing the continuance body of knowledge.

(iv) Satisfactions influence on continuance, although reduced in influential ranking was found to be a predictor of continuance intention in this study. This finding reinforces the value of the PAM and the robustness of the satisfaction variable in explaining user continuance intention in a developing world context.

6.2.2 Practical Contribution

The study posed two RQs: (i) what are the antecedents of user continuance intention towards M-pesa in Kenya? (ii) What are the determinants of user continuance intention towards M-pesa in Kenya?

The answers to these questions provide valuable implications and contributions to practice in fostering development, promotion, and facilitating the use of MMS. The proliferated view on user continuance intention holds that a user's satisfaction with a technology-enabled product or service is the dominant influencer of continuance intention. The results of this study contend this view and present a new perspective on other determinants of continuance intention and the order of influential strength. Recap, a post-hoc analysis of IPMA was conducted to determine the importance and performance of the factors in the study's model. IPMA unites customers (importance) and vendors (performance) perspectives in assessing the relative improvement priorities that should be applied to develop competitiveness (James, 1977). The results show that all variables are important, albeit of varying degrees, and performance of some factors are good while others require improvement.

Ten factors were modelled and tested as potential antecedents and determinants of user continuance intention towards M-pesa, and these included: perceived task-technology fit, post-usage usefulness, confirmation, system quality, information quality, service quality, utilization, satisfaction, trust, and flow. From the IPMA results, the factor rankings of importance and performance are presented below in table 6.7.

Table 6.7 Importance and Performance Ranking of Factors in the Study's Model

Factor	Importance	Performance
Service quality	1st	5th
Information quality	2nd	5th
System quality	3rd	5th
Trust	4th	2nd
Task-technology fit	5th	5th
Utilization	6th	5th
Confirmation	7th	5th
Flow	8th	1st
Satisfaction	9th	3rd
Post-usage usefulness	10th	4th

6.2.2.1 Results Implications for Practice

Discussion of the results in the previous sections were centred around the PLS-SEM analysis, which presents the relative importance of constructs in the structural model by extracting estimations of the direct, indirect, and total relationship. In this section the researcher presents results from the IPMA which extended the PLS –SEM results with a new dimension that includes the actual performance of each construct. This approach is of value to practitioners as they can assess individual factors that consumers place importance on, and their performance on the factors. Next, the researcher discusses practical implications of each factor in the model, in order of importance as ascertained by the IPMA.

6.2.2.1.1 Service Quality

Based on IPMA, service quality emerged as the most important factor; however, its performance was low. Recap, service quality denotes the support that users receive from a vendor, and was hypothesized to influence a user's satisfaction, flow, and trust in M-pesa. It is merited by empathy, reliability, personalization, responsiveness, and assurance (DeLone & McLean, 1992; Zhou, 2013). Three relationships were hypothesized based on service quality, and are presented in table 6.8.

Table 6.8 Service quality-based relationships

Construct	Hypothesized Relationships in this Study	Result
Service Quality	Service Quality → Satisfaction	Supported
	Service Quality → Flow	Supported
	Service Quality→ Trust	Supported

The results revealed that all three factors are impacted by service quality. Practical inference can thus be made that: (i) users recognize the need for a quality system to be characterized by empathy, reliability, personalization, responsiveness, and assurance. However, the users consider the M-pesa vendor lacking in delivering a consistent, reactive, and guaranteed service. (ii) Users expect the M-pesa vendor to provide them with adequate support for its services, and while connections and system responses are sometimes reliable, and some users acknowledge full

immersion while engaging with M-pesa services. However, this experience is inconsistent across users and requires improvement. (iii) The M-pesa vendor has not fully discharged it pact on the service level agreements made to its user and this could weigh on the credibility for the exchange relationship with the user. As such, the M-pesa vendor needs to improve aspects of its system quality (e.g., navigation, ease of use, and graphics).

6.2.2.1.2 Information Quality

Information quality emerged as the second most important factor of the IPMA, and its performance was also low. It is characterized by accuracy, timeliness, and completeness, currency, and usability (DeLone & McLean, 1992; 2003). Information quality was hypothesized to influence a user's satisfaction, flow, and trust in M-pesa, as presented in table 6.9.

Table 6.9 Information quality-based relationships

Construct	Hypothesized Relationships in this Study	Result
Information Quality	Information Quality → Satisfaction	Unsupported
	Information Quality → Flow	Supported
	Information Quality→ Trust	Supported

Two of the three relationships were supported, which hold the following practical implications: (i) Information quality's influence on flow implies that users of M-pesa recognize the need for quality information but have some reservations about the accuracy of information provided to them. This perception needs to be altered as users of M-pesa are likely spending time scrutinizing the information provided, and this would detract from a pleasurable user experience for them with M-pesa. (ii) Second, information quality's influence on trust suggests that users of M-pesa users are aware of the value of receiving quality information from M-pesa but assume that the M-pesa

vendor has not been steadfast in presenting them with accurate details about their financial transactions.

6.2.2.1.3 System Quality

The third most important factor based on the IPMA was system quality, although, it had a low performance rating. System quality is characterized by ease of use, reliability, speed, good navigation, an appealing interface, amongst others. It was hypothesized to influence satisfaction, trust, and flow. Support for two of the three hypotheses presented in table 6.10 was realized. The exception without support was systems quality's insignificant influence on satisfaction.

Table 6.10 system quality-based relationships

Construct	Hypothesized Relationships in this Study	Result
System Quality	System Quality → Satisfaction	Unsupported
	System Quality → Flow	Supported
	System Quality→ Trust	Supported

From a practical viewpoint, an unsupported relationship between system quality and satisfaction suggests that the surveyed users may not consider visual presentation of M-pesa, ease of use and navigation as noteworthy gains to be realized from using M-pesa. Conversely, it could suggest that the M-pesa vendor does not presently offer a system that meets users' perception as visually appealing, easy to use, and navigable. Thus, users may not view the present state of these features as recognizable gains of using M-pesa. In a positive light, the affirmative relationships discovered between system quality and flow, and system quality and trust suggest respectively that: (i) Surveyed users recognize the need for M-pesa to be an easy to use system and that the functionalities of it should match their skills, to enable an environment for full immersion during use of the service. This recognition by the user has however not been facilitated by the M-pesa vendor and requires improvement (ii) While surveyed users recognize the need for a quality system, the M-pesa vendor still lacks in delivering a system that is characterized by the aforementioned qualities of a good system.

6.2.2.1.4 Trust

The results of the IPMA placed Trust as the fourth most important factor. However, it had a better performance rating than the quality factors from the IS success model. Trust was hypothesized to positively influence flow and continuance intention. Only one of these two hypotheses was supported, as shown in table 6.11.

Table 6.11 Trust-based relationships

Construct	Hypothesized Relationships in this Study	Result
Trust	Trust → Flow	Unsupported
	Trust → Continuance Intention	Supported

The study argued that trust influences flow, in that, it grants a subjective assurance that users would obtain a superior experience in future, with the belief that a mobile money vendor has capacity, veracity, and goodwill to deliver quality services to them (Zhou, 2013). This finding of an unsupported relationship, although unexpected, suggests that users recognize the significance of trust but are not unanimously convinced that the M-pesa vendor provides them with optimum service that would maximize their user experience. As such it could mean that users feel that the M-pesa vendor has not discharged all its duties in providing services that would keep them completely focused while engaging with M-pesa. Some of the shortcomings of the M-pesa vendor could include: inaccurate account information, unreliable and fast connections, unappealing interface, etc. and in turn, these perceptions have detracted from an absorbing overall experience for M-pesa users'. Hence, there is need for improvements in these areas. Second, on a more positive note, Trust emerged as the strongest determinant of user continuance intention in this study. The IPMA results reflect the standard PLS-SEM analysis, revealing that trust is an important factor amongst the determinants that management should focus on. This finding contends proliferated belief that satisfaction is the dominant predictor of continuance. However, the practical implication of this occurrence means that above all modelled determinants (utilization, satisfaction, and flow), the surveyed users' appreciate that the M-pesa vendor has exhibited some reliance in this relationship where they have placed themselves in a vulnerable position (depositing money with the M-pesa vendor and expecting to withdraw at will) with the

belief that the M-pesa vendor will act as expected. As such, the users acknowledge that the M-pesa vendor has shown some ability, integrity, and benevolence in discharging its duties and this is a valuable reason to continue use of the service. This implies that there is still room for improvement in building a long-term trustworthy relationship between the M-pesa vendor and users.

6.2.2.1.5 Perceived task-technology Fit

Users' perception of task-technology fit of M-pesa was the fifth most important variable of an IPMA. The study hypothesized that a user's perceived TTF would influence his or her utilization of M-pesa, as shown in table 6.12. The results of the PLS-SEM analysis suggest that surveyed users' of M-pesa acknowledge that M-pesa is relevant for the execution of their tasks (sending money and receiving money) and that they possesses the ability to use it, which is a reason for their use of it. However, while the results of the IPMA ranks perceived TTF as an important factor, its performance rating was low.

Table 6.12 TTF-based relationship

Construct	Hypothesized Relationships in this Study	Result
Perceived Task-Technology Fit	Perceived Task-Technology Fit → Utilization	Supported

As such, from a practical outlook, the low performance rating of TTF suggest that while users of M-pesa consider some match amongst M-pesa, their tasks, and their ability to use the service, they still hold reservations about these alignments. Thus, this finding suggest that to promote use of M-pesa or MMS, it is imperative for the vendor to outline to prospective and current users the characteristics or functionalities of mobile money for a specific task, its ease of use, and users ability to utilize the functionality to complete the task. This approach may better shape user perception of alignment amongst M-pesa, their tasks, and their abilities to use it.

6.2.2.1.6 Utilization

The IPMA results present utilization as the sixth most important factor, yet, it had a low performance rating by users. Utilization is a dual condition of use or no use of a technology (Goodhue & Thompson, 1995), and this study argued that a user's level of M-pesa use could then

be seen as an indicator of whether he or she has identified a feature of the service that matches his or her task requirement. Two hypotheses were made based on utilization as presented in table 6.13.

Table 6.13 Utilization-based relationships

Construct	Hypothesized Relationships in this Study	Result
Utilization	Utilization → Satisfaction	Supported
	Utilization → Continuance Intention	Supported

The first, a positive influence of utilization on satisfaction practically implies that the surveyed users in this study submit that they use M-pesa because it meets one or more of their monetary transaction needs, increases their productivity, in that: it makes sending and receiving money faster, efficient, and cost effective. However, a low performance rating suggests that there are features of M-pesa that users would like to use but do not identify with. An example could be an individual who appreciates sending money via M-pesa but dreads the process of withdrawal where he or she has to physically present. Thus, while the M-pesa vendor has discharged some of its duties in matching the service's functionalities to the transaction needs of it users, there are improvements to be made to realize satisfaction.

The second factor, Utilization, was discovered as the second strongest determinant of user continuance intention. This was an unusual result as its predictive power exceeded that of satisfaction in determining continuance intention. A practical connotation to this finding could be that the surveyed users' of M-pesa identify with certain or all functionality (deposit or withdrawal) of M-pesa, and while they might not be entirely satisfied with it, it serves for the execution of their tasks, and they will continue to use it until a better alternative is available. Thus, management needs to individually examine user satisfaction within areas of their service offerings to identify aspects for improvement.

6.2.2.1.7 Confirmation

Confirmation was found to be the seventh most important factor, but had a low performance rating. It was hypothesized to influence both post-usage usefulness and satisfaction, as presented in table 6.14.

Table 6.14 Confirmation-based relationships

Construct	Hypothesized Relationships in this Study	Result
Confirmation	Confirmation → Post-Usage Usefulness →	Supported
	Confirmation → Satisfaction	Supported

While confirmation is validated in this study as an antecedent and an important factor in understanding user continuance with M-pesa, the low performance rating requires attention. Confirmation entailed benchmarking a user's expectation and affirmation following a period of use of the M-pesa service. Practical implications for its validation and influence on post-usage usefulness and satisfaction suggest that: (i) Respondents actual use of M-pesa have positively influenced their perception of usefulness of the service in sending and receiving money, as some of their perception of reality has been affirmed. Yet, respondents still expect more utility of the service (ii) User recognition of some of the expected gains of using M-pesa has been realized, which implies that the M-pesa vendor have thus far delivered some level of service that meet user anticipation of its posited offerings in sending and receiving money. However, much is still desired of users from the M-pesa vendor.

6.2.2.1.8 Flow

The IPMA revealed Flow as the eight most important factors within the study's model, but it has a relatively good performance rating. A relationship between flow and satisfaction, and flow and continuance intention were hypothesized as presented below in table 6.15. The argument for the first hypothesis was: a user whom is fully immersed while engaging with M-pesa, and finds it pleasurable, is likely to recognise and acknowledge gains of using the service and exit content with the experience. However, this assertion was not supported. The second argument was: When

a user of M-pesa experiences flow during use, he or she would have enjoyed it and will be inclined to re-live the experience (Zhou, 2013).

Table 6.15 Flow based relationships

Construct	Hypothesized Relationships in this Study	Result
Flow	Flow→ Satisfaction	Unsupported
	Flow → Continuance	Supported
Non- hypothesized relationship from post-hoc analysis		
Flow	Flow→Satisfaction→ Continuance	Supported moderating effect

A practical implication for an unsupported direct relationship between flow and satisfaction could mean that the M-pesa vendor has not unanimously provided a compelling user experience and this leaves more to be desired by the user for a persuasive experience while using the service. Conversely, given its position as the eight most important factor, it suggests that users may not place high value on a flow experience and thus discount emphasis on focus, control, and pleasure while using M-pesa. On a more positive note, flow was discovered as a determinant of user continuance intention and is the third strongest determinant. An influence of flow practically implies that user behaviour is also influenced by intrinsic motivation. This means that users appreciate some level of control, focus, and enjoyment while using M-pesa, although they place little emphasis on it. That said, the post-hoc analysis revealed a moderating relationship between flow and satisfaction. Although not hypothesized in this study, this finding suggests that a user's level of flow with M-pesa influences their satisfaction level with the service.

6.2.2.1.9 Satisfaction

The IPMA presented satisfaction as the ninth most important factor in this study; however, it had a recognizable level of performance rating by users. As presented below in table 6.16, satisfaction was posited as a determinant of user continuance intention, and the relationship was supported.

Table 6.16 Satisfaction based relationship

Construct	Hypothesized Relationships in this Study	Result
Satisfaction	Satisfaction → Continuance Intention	Supported

Satisfaction emerged as the least strong determinant of continuance intention holding that the surveyed users' place their trust, use, and flow with M-pesa above their satisfaction with the service. This is a fascinating occurrence, and suggests practically that although users feel a level of content with using M-pesa, they have more expectations of the service which are presently not met. To exemplify this, a supplementary question in this study inquired into additional services that users anticipate M-pesa to offer in the future, and quite a number of responses were collected (see section 5.8.4, table 5.10.). The users' suggestion of additional services denotes that M-pesa needs to expand their range of services to realize optimum user satisfaction with the service.

On a second note, a moderating relationship, although not hypothesized in this study, was found to exist between satisfaction and flow. This was discovered in a post-hoc analysis. While no argument was made for this relationship, it suggests that a user's level of immersion while engaging with M-pesa impacts his or her recognition of gains derived from the service.

6.2.2.1.10 Post-usage Usefulness

The IPMA submits that PUU is the least most important factor amongst the ten variables comprising the study's model, and its performance was ranked low. As presented in table 6.17, PUU was hypothesized to influence satisfaction but the relationship was unsupported.

Table 6.17 PUU-based relationship

Construct	Hypothesized Relationships in this Study	Result
Post-Usage Usefulness	Post-Usage Usefulness → Satisfaction	Not Supported

This finding of an unsupported relationship between PUU and satisfaction, and a low importance and performance ranking were unexpected yet interesting. Practically, this occurrence suggests that user satisfaction with M-pesa develops independent of the various levels of perceived usefulness. In essence, while a user's perception of the usefulness of M-pesa is a cumulative

belief based on multiple interactions with the service, feelings of satisfaction could be transaction-specific. As such, while a general perception of M-pesa usefulness seems to be granted, each transaction experience may be inconsistent for the users. Thus, the M-pesa vendor needs to devise ways to ensure a consistent experience across each transaction.

6.3 Strengths and Limitations of the Study

In research, we make no claims that findings of a single study can provide a complete solution to a problem. As such, each study inherently holds strengths and limitations. The subsequent sub-sections outline the strong points and constraints of this study's findings**.**

6.3.1 Strengths

The cogency of this study realized the following gains, notably: the developing country context, theoretical development, and the research methodology.

6.3.1.1 Developing Country Context

The thesis focused on investigating user continuance intention towards a proliferated mobile technology-enabled service (M-pesa) in a developing country- Kenya. The proliferation of a technology-enabled service in a developing country is an unconventional occurrence in our world, and while a first, it has not received the attention it deserves in the literature. To the best of the researcher's knowledge, this study took the lead in investigating user continuance intention towards MMS in Africa where M-pesa's success has been widely witnessed but with scant empirical documentation. The execution of this study has revealed insights which could have been concealed void this study. Discoveries of the determinants and the strength of influence of factors towards continuance intention amongst individuals in the developing world were found to differ from conventional wisdom in the developed world: that satisfaction (user recognition of gains from use of a service is the most potent determinant of continuance intention). Amongst Kenyan respondents, this view was met with outright contention, as satisfactions dominant position was unseated by three variables (trust, utilization, and flow), placing it as the least dominant predictor of continuance intention. Thus, a contextual strength of this study is its revelation of the distinct order of determinants of continuance intention amongst persons in the developing and developed world.

6.3.1.2 Theoretical Development

The core theoretical strength of this study is the integration of factors from reputable models (PAM, TTF, IS success model) and theories (flow and trust) in the literature to explain a contemporary phenomenon of technology proliferation and use in our world. A combination of the models and theories from the IS and psychology disciplines has birthed novel views in our understanding of continuance intention. This study has overcome the parochial view of behavioural beliefs as sole determinants of continuance. The integration of others beliefs such as control, object-based, and attitude, has advanced our views of factors, their relationships, and strengths in influencing consumer behaviour towards continuance with technology-enabled services.

6.3.1.3 Research Methodology

First, adoption of constructs from the literature enabled a rational integration of recognized models and theories from the IS and Psychology literatures to be modelled and tested as determinants of continuance intention. This approach increased the likelihood of realizing a research model with ample explanatory power.

Second, selection of a positivist paradigm and a hypothetico-deductive approach in explaining the M-pesa continuance phenomenon ensures that discoveries of the underlying laws of causation are identified, documented, and findings are available to be replicated and validated by other scholars in the field.

Third, the data collection technique of primary data enabled inquiry on the subject matter (continuance intention) to be informed by current and actual users of M-pesa in Kenya.

Fourth, data collection of supplementary open-ended questions validated the results of this study by supporting the explanation of some of the findings. Illustratively, the finding that satisfaction was the least strong determinant of user continuance intention was justified with responses in the open-ended questions where participants were inquired of expected additional service offerings, and noted a number of them.

Fifth, the study employed multi-statistical techniques to analyze the data. This provided additional care in reporting the quality of the results derived from the data. The post-hoc analysis which featured IPMA, enabled advancements in interpreting the study's result, in that, it compares the structural model's total effects (importance) and the average values of the independent variables

scores (performance) to underline significant areas for vendors to improve their managerial activities.

6.3.2 Limitations

It is an inherent characteristic of all research studies to have constraints. As such, this study is no exception. The limitations of this study are presented below in table 6.17.

Table 6.18 Limitations of the study

Research Phase	Limitation	Discussion
Research Design	Mono-philosophical assumption	This study adopted a positivist assumption. While criticisms may emerge that this paradigm does not produce an in-depth understanding of the phenomenon at hand, it is believed to serve its purpose adequately in answering the study's RQs. Thus, it could be viewed as a groundwork for which future studies may employ a multi-philosophical approach to further unpack the findings of this study.
Theoretical Underpinnings	Models and theories of IS and psychology	The development of the study's model was guided by selected theories. Therefore the study's model encloses limitations in scope and application consistent with the adopted theories. However, a multi-theory approach was a strategy adopted in the study to minimize the limitations associated with a single theory.
Data collection	Cross-sectional	A cross sectional approach for data collection has some inherent limitations. Mindful that the present study focuses on user behaviour towards a technology-based service: 1. User behaviour is dynamic (cognition and attitudes) and alternates over time. Thus, a cross-sectional study may not capture the temporal change in user post-adoption beliefs. To this end, a longitudinal study may better capture how changes in user cognition and attitude affect their usage behaviour. 2. Cross-sectional studies diminish support for any claims about causality (Bailey, 1982, p. 233). Whereas, a longitudinal study better supports causality as temporal ordering of constructs may have been

		established (Bailey, 1982, p. 48). Nonetheless, given that extant studies provide some support for the selected variables in the present study, it is rational to assume that causation stems from some of the selected variables to continuance intention.
Survey Instrument	Questionnaires with mostly close-ended questions.	Likert scales were employed as the primary method of data collection in the survey instrument. These are self-reported measures of variables and are subject to variations in the attitudes and beliefs shaped by respondents' experiences. Although likert scales are dominantly employed in IS quantitative research, with the key assumption that such measures closely reflect actual practice and outcomes, results may be considered more credible if continuance intention measures were assessed using objective measures. Consequently, it would be instructive for future studies to replicate the present study's results with objective measures of user continuance intention towards M-pesa.
Sample Size	Sample size of 434	To make substantial statistical inference, researchers usually target a 95% level of certainty; implying that where a sample was selected 100 times, a minimum of 95 of these samples would conform to the characteristics of the population (Saunders et al. 2009). To ensure a substantial confidence level of data and a low margin of error in this study, the researcher adhered to guidelines provided by Saunders et al. (2009, p. 219); where a population of 10 million and over would require at least 384 responses for a 5% margin of error. While this figure would suffice for statistical tests, a larger sample would increase generalizations that can be made.
Data Analysis	Data analysis techniques	A binary (SEM-PLS and ANN) approach was selected for the present study. While the logic behind a dual approach is to complement the shortcomings of each technique, the inherent limitations of each technique may still influence the results of the present study.
Common Methods Bias	Self-reported responses	Data collected in this study captured self-reported beliefs towards the predictor and criterion variables. The use of the same methods in capturing

		both variable categories is susceptible to common methods bias (Podsakoff et al. 2003; Straub & Burton-Jones, 2007). This limitation is inevitable for the present kind of study as responses to both the predictor and criterion variables are provided by the same individual (King, Liu, Haney, & He, 2007).

In spite of the above limitations, this study provides insights on user continuance intention which would be valuable for researchers and practitioners. Also, this study discovered novel traits that could be of interest to researchers in exploring studies in this context and in validating the findings of this study in other contexts.

6.4 Directions for Future Studies

Several ideas have emerged from this study for further exploration. Future work should address the limitations of this study, and further explore some of the findings of this study outlined below:

(i) Validate the empirical model amongst a broader range of users of M-pesa or users of other technology-enabled services. Given that M-pesa is presently used by over 17 million individuals in Kenya alone, and the sample analyzed consisted only 434 participants; it is imperative to capture and analyze the responses of a larger sample to enable a wider generalization of these findings.

(ii) Test the empirical model in other developing regions. This is particularly important because this study has revealed that conventional wisdom of the dominant determinant of user continuance intention (satisfaction) may differ in importance for individuals' in a developing region- Africa, and vendors approach towards fostering continuance amongst inhabitants in these regions may require distinct approaches.

(iii) Extend the empirical model to include usage behaviour. An extension to include usage behaviour is imperative because intention is investigated as a means to predict behaviour. This study opted to investigate continuance intention instead of behaviour because of the scant records of continuance intention studies amongst individual in developing regions. The decision to investigate intention before behaviour has been worthwhile, as the extant literatures position on potency of determinants of continuance intention is now contended with the findings of this study. Thus, researchers should endeavour to revalidate beliefs towards individual technology-enabled

services in stages and not leapfrog the technology use cycle based on extant findings, as contextual views may impact greatly on results.

(iv) Employ a mix-methods approach in investigating user continuance intention and further continuance behaviour. The positivist approach employed in this study enabled the discovery of the underlying laws of causation governing continuance intention towards M-pesa. An interpretivist or critical realist approach will aid advancement of this discovery by providing deeper insights on why users place certain beliefs above others in continuance decisions (e.g., trust over satisfaction).

(v) Adopt a longitudinal approach in investigation. The cross-sectional approach used in this study limits claims of causality; however, a longitudinal approach provides stronger evidence for causality as temporal ordering of constructs can be established (Bailey, 1982. p.48)

(vi) The importance of task-centric factors proved to be important antecedents and determinants of continuance intention. This study measured tasks of M-pesa users as sending and receiving money. These tasks could be further unpacked in measurement items by further listing the sub-tasks within sending and receiving money (e.g., payment of fees, utility bills, etc.). This approach will better inform the vendor of more specific dominant use of M-pesa by the users.

vii) Trust emerged as the strongest determinant of user continuance intention. This discovery demands further attention as it would be worthwhile to discover individual's logic for placing trust over satisfaction in using mobile money. A valuable study would be to identify the dimensions of trust in fostering continuance intention.

viii) Satisfactions position in determining continuance intention amongst Kenyans also necessitates further inquiry. An interpretive study that explains variations in views of satisfaction may improve our understanding of why satisfaction ranks so low in determining continuance amongst user of M-pesa in Kenya.

ix) Flows influence in determining continuance while significant, leaves much to be understood. Flow is complex concept that entails attributes like control, pleasure, focus, amongst others. This study measured flow across the aforementioned concepts. However, for greater insights on the dimensions of flow in influencing continuance, a study that measures each facet of flow as an entity will improve our understanding of the distinct flow components that influence continuance intention. Additionally, the post-hoc analysis found flow to moderate satisfactions influence on continuance intention. This relationship was not hypothesized in this study; however, future studies could further explore this connection.

6.5 Conclusion of the Thesis

The objective of this study was to advance our knowledge of user continuance intention towards mobile money services, with a focus on a developing country. To achieve this, a theoretical model was developed based on models and theories of IS and psychology. Factors used in the model development included: perceived task technology fit, utilization, confirmation, satisfaction, system quality, information quality, service quality, trust, flow, and continuance intention. To ensure validity, measures of the afore-noted factors were adopted from the literature and operationalized to the study's context. A survey instrument was developed and distributed using an intercept protocol. Data was collected from 618 users of a mobile money service (M-pesa), however, following data cleansing, only 434 cases were retained for analysis.

To validate the conceptual model of the study, data was submitted to SEM for examination of the study's hypotheses, reliability, and validity of the measures. Thereafter, ANN was used to verify the determinants of user continuance intention towards M-pesa. The results suggested that the study's model had ample predictive strength of 33.4% in explaining user continuance intention towards M-pesa.

Findings of this study reinforced and also contested conventional wisdom in explaining continuance intention. Conventional views of satisfaction as a determinant of user continuance intention was validated; however, its predictive strength was demoted by trust, utilization, and flow. Thus, the surveyed users in Kenya, possesses behaviour that differs from our extant knowledge of the influential order of continuance determinants, and this requires further investigation. The key theoretical contribution of this study was an integration of factors of behavioural beliefs, control beliefs, and attitude to explain continuance intention. Factors from each dimension of belief, adopted from IS models and psychology theories, played a significant role in determining user continuance intention. From a practical outlook, the findings of this study can inform mobile money vendors and vendors of other technology-enabled services on strategies to consider in positioning their products and services to consumer groups in developing regions.

Last, the scant documentation of technology proliferation and use in a developing country was a key motivation for this study. As such, this study has given new empirical and validated evidence for continuance scholars. It identified factors across a number of beliefs to determine continuance and provided justification for their integration. Consequently, theoreticians and practitioners can

now explain some of the determinants of user continuance intention towards MMS in a developing country. Further, the importance of re-validating conventional beliefs within context has been highlighted in this study.

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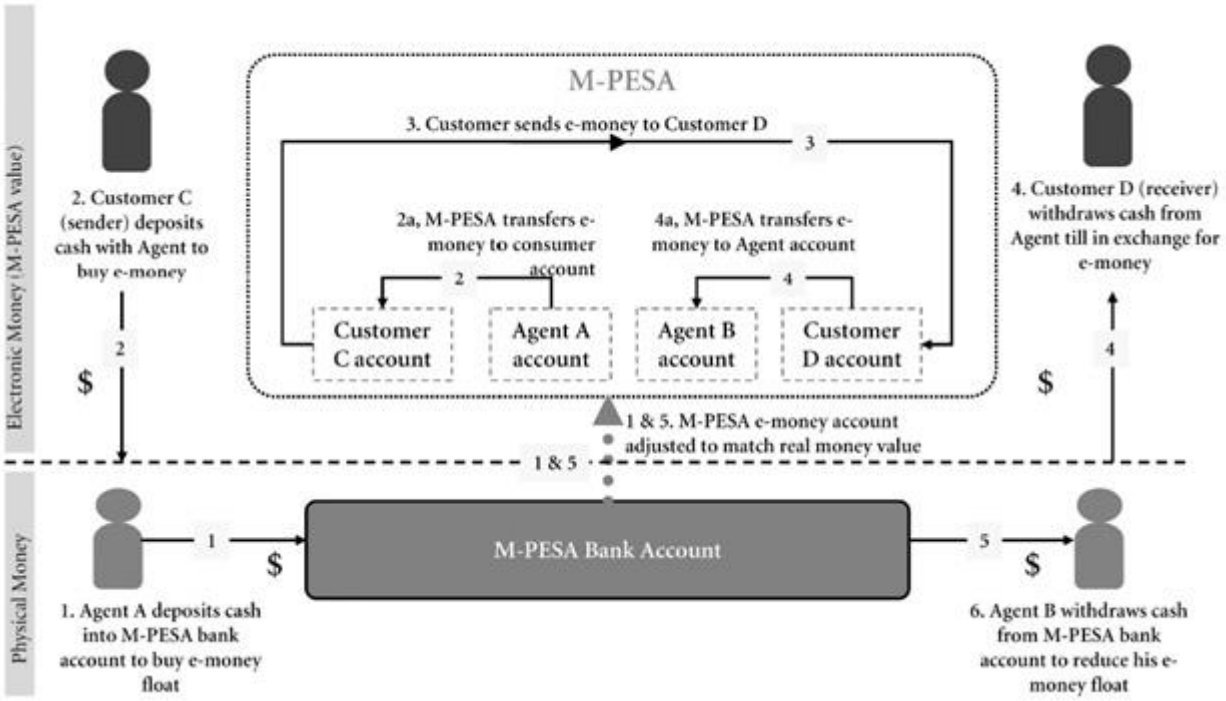
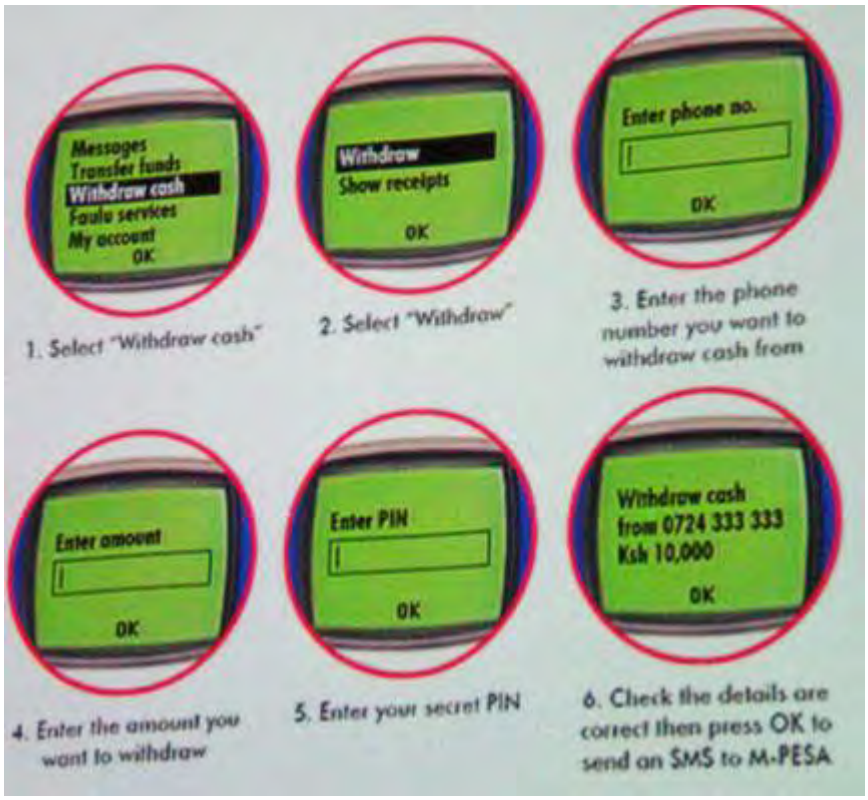
8. APPENDICES

8.1 Appendix 1- How M-pesa Works

8.2 Appendix 2- Flow of Events during M-pesa use



8.3 Appendix 3- M-pesa User Interface



8.4 Appendix 4- Participant Information Sheet

Participant Information Sheet

Good day,

My name is Olam Osah and I am a doctoral candidate in Information Systems at the University of Cape Town, South Africa. I am inviting you to participate in a survey for my doctoral thesis which aims to collect data to be used in predicting user continuance intentions towards M-pesa. Your responses to this questionnaire will aid in the creation of knowledge towards sustaining M-pesa service.

This questionnaire contains two sections and takes approximately 10-15 minutes to complete. Should you be willing to participate in this survey, your responses will be used solely for research purposes. The questionnaire is completely anonymous and confidentiality will be maintained. This survey is voluntary and you may choose to opt out at any time.

Thank you for considering participating in this survey. Should you have any questions or wish to obtain a copy of the results, please contact me on: +27 74 452 2326 or oshola002@myuct.ac.za

Yours Sincerely,

Olam Osah
Ph.D Candidate
Department of Information Systems
University of Cape Town, South Africa.

8.5 Appendix 5- Survey Instrument

Section 1- Questionnaire

Please indicate by marking with an 'X,' the extent to which you agree with each of the following statements.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. The money transfer/deposit function of M-pesa allows me to send money							
2. The money withdrawal function of M-pesa allows me to receive money							
3. In general, the deposit (send money) and withdrawal (receive money) functions of M-pesa fully meets my money transfer needs							
4. Over the year(s), I find that using M-pesa for sending money increases my productivity (e.g., makes sending money faster, efficient, and cost effective)							
5. Over the year(s), I find that using M-pesa for receiving money increases my productivity (e.g., makes receiving money faster, efficient, and cost effective)							
6. Over the year(s), I find that using M-pesa meets my monetary transaction needs.							
7. My experience using M-pesa is better than what I expected before using it							
8. The service(s) provided by M-pesa is better than what I expected before using it							
9. Overall, most of my expectations from using M-pesa were met							
10. M-pesa quickly loads all text and images							
11. M-pesa is easy to use							
12. M-pesa is easy to navigate							
13. M-pesa provides me with relevant information for/about my transactions.							
14. M-pesa provides me with accurate transaction information (e.g., account balance)							
15. M-pesa provides me with current transaction information (e.g., account balance)							
16. M-pesa provides transaction services in a timely manner (i.e., quick response time)							
17. M-pesa provides quick responses to transaction queries (e.g., account balance enquires)							
18. M-pesa provides personalized services							
19. I use M-pesa for sending money							
20. I use M-pesa for receiving money							
21. I am very dependent on M-pesa for monetary transactions							
22. I feel satisfied using M-pesa							
23. I feel content with using M-pesa							
24. I feel pleased with using M-pesa							

Please indicate by marking with an 'X,' the extent to which you agree with each of the following statements.	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
25. When using M-pesa, my attention is focused on the activity							
26. When using M-pesa, I feel in control of the activity							
27. When using M-pesa, my attention is not easily diverted							
28. When using M-pesa, I enjoy it							
29. M-pesa service provider (Safaricom) is trustworthy							
30. M-pesa service provider (Safaricom) fulfils its promise(s)							
31. M-pesa service provider (Safaricom) keeps customers' interest in mind							
32. I intend to continue using M-pesa to send money							
33. I intend to continue using M-pesa to receive money							
34. My intentions are to continue using M-pesa rather than use any alternative means							
35. I would like to discontinue my use of M-pesa							

Section 2: Participant's Profile

Gender

Male ☐	Female ☐

Age

Less than 18 ☐	18-30 ☐	31-40 ☐	41-50 ☐	Above 50 ☐

Level of Education

Primary ☐	Secondary ☐	Post-Secondary School (Certificate/Diploma) ☐	University or College ☐	Post Graduate (Masters, Doctorate) ☐	Other ☐

Annual / Yearly income in Kenya Shillings

Less than 500,000 ☐	Between 501,000 - 1000,000 ☐	Between 1001,000 - 2000,000 ☐	Between 2,001,000 – 3,000,000 ☐	Over 3,001,000 ☐

Period of M-pesa Use

How long have you been using M-pesa?	Less than 1 year ☐	1 - 3 years ☐	3 – 5 years ☐	Over 5 Years ☐

Frequency of M-pesa use

How often do you use M-pesa?	Daily ☐	Weekly ☐	Monthly ☐	Other ☐
If **other** please state in this box.				

Primary Use of M-pesa

What is your primary use of M-pesa?	Send Money ☐	Receive Money ☐	Pay Bills ☐	Buy Goods ☐	Other ☐
If **other** please state in this box.					

Extensions to current M-pesa service offerings

What extension(s) to your current M-pesa service offerings would you like to have in the nearest future?	

Mobile Platform

What Kind of mobile device do you operate M-pesa on?	Conventional Mobile Phone (i.e., does not run apps or flashy features) ☐	Smart Phone (i.e., IPhone, Samsung Galaxy, HTC, etc.) ☐	Tablet ☐	Other ☐
If **other**, please state in this box.				

Thank you for participating in this survey

8.6 Appendix 6- Descriptive for Retained Cases

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TTF1	537	5	7	6.36	.546	-.047	.105	-.844	.210
TTF2	537	5	7	6.31	.556	-.047	.105	-.639	.210
TTF3	537	4	7	6.28	.545	-.010	.105	-.081	.210
PUU1	537	4	7	6.19	.592	-.298	.105	.647	.210
PUU2	537	4	7	6.21	.606	-.437	.105	.950	.210
PUU3	537	4	7	6.20	.609	-.527	.105	1.363	.210
CONF1	537	3	7	6.26	.720	-1.069	.105	2.051	.210
CONF2	537	3	7	6.16	.717	-.985	.105	1.867	.210
CONF3	537	3	7	6.18	.771	-1.138	.105	2.280	.210
SYSQ1	537	3	7	6.04	.742	-1.028	.105	2.248	.210
SYSQ2	537	4	7	6.20	.622	-.499	.105	.929	.210
SYSQ3	537	4	7	6.15	.616	-.489	.105	1.180	.210
INFQ1	537	3	7	6.29	.673	-.979	.105	2.038	.210
INFQ2	537	4	7	6.36	.608	-.633	.105	.767	.210
INFQ3	537	4	7	6.32	.628	-.649	.105	.762	.210
SERVQ1	537	3	7	6.12	.785	-1.267	.105	2.951	.210
SERVQ2	537	3	7	6.07	.717	-1.288	.105	3.938	.210
SERVQ3	537	2	7	6.09	.808	-1.401	.105	3.676	.210
UTL1	537	4	7	6.26	.530	.085	.105	.028	.210
UTL2	537	4	7	6.23	.556	-.235	.105	1.072	.210
UTL3	537	3	7	6.14	.695	-1.334	.105	4.647	.210
SAT1	537	5	7	6.42	.513	.098	.105	-1.498	.210
SAT2	537	5	7	6.37	.499	.355	.105	-1.423	.210
SAT3	537	5	7	6.37	.503	.299	.105	-1.376	.210
FLOW1	537	3	7	6.31	.730	-1.381	.105	3.390	.210
FLOW2	537	3	7	6.13	.701	-1.518	.105	5.171	.210
FLOW3	537	2	7	6.19	.876	-1.842	.105	5.196	.210
FLOW4	537	3	7	6.00	.824	-1.218	.105	2.132	.210
TRUST1	537	2	7	6.16	.758	-1.667	.105	5.855	.210
TRUST2	537	2	7	5.96	.734	-1.553	.105	4.800	.210
TRUST3	537	3	7	5.94	.735	-1.285	.105	3.254	.210
CONT1	537	4	7	6.34	.576	-.480	.105	1.053	.210
CONT2	537	4	7	6.28	.596	-.563	.105	1.385	.210
CONT3	537	1	7	5.92	1.010	-2.188	.105	6.989	.210
RCONT4	537	2.00	7.00	6.2737	.61807	-1.017	.105	4.769	.210
Valid N (listwise)	537								