

**THE INFLUENCE OF THE ROLES OF MOBILE-PHONE USERS ON THE
ADOPTION OF M-COMMERCE ACTIVITIES – THE CASE OF KENYA**



By

PHILIP GICHABA MACHOKA (MCHPHI007)

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Supervisor: Professor Michael Kyobe

Co-Supervisor: Professor Irwin Brown

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DECLARATION

I hereby declare that the Ph.D. thesis titled
**THE INFLUENCE OF THE ROLES OF MOBILE-PHONE USERS ON THE
ADOPTION OF M-COMMERCE ACTIVITIES – THE CASE OF KENYA**
is my work, and that all sources have been acknowledged through
referencing

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PHILIP G. MACHOKA

11th JUNE 2021

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First and foremost, I thank you, Lord, for always being there for me.

I would like to thank my parents, Nicodemus Machoka and Bathsheba Machoka, for their love and support throughout my life. Thank you both for giving me the strength to reach for the stars and chase my dreams.

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DEDICATION

This thesis is dedicated to my parents,
for their endless love, support, and encouragement

THE INFLUENCE OF THE ROLES OF MOBILE-PHONE USERS ON THE ADOPTION OF M-COMMERCE ACTIVITIES – THE CASE OF KENYA

ABSTRACT

Mobile technologies' arrival and phenomenal growth have moved the boundaries of how business transactions are conducted today, i.e., the emergence of mobile commerce (m-commerce). M-commerce presumes mobility, broad reach, ubiquity, convenience, and localization of devices and users. As a result, M-commerce is also transforming conventional value networks and the broader countries' economies.

Understanding what drives m-commerce adoption in developing economies remains unclear because of competing/conflicting findings in m-commerce adoption studies. Little is known about the roles mobile-phone users play, i.e., technology-user role, consumer role, social network-member role, and how they influence the adoption of m-commerce activities (i.e., content delivery, entertainment, and transactions). Mobile-phone users are individuals using mobile-phone devices for communication, transactions, entertainment, and socialization. This study defines roles as the part people play in performing day-to-day social life. Therefore, this study seeks to identify factors influencing mobile-phone users towards adopting m-commerce activities from mobile-phone users roles viewpoint.

A review of information systems literature revealed that mobile-phone users play the following roles: technology-user, consumer, and social network-member. A literature review also revealed a dearth of empirical studies focusing on adopting and accepting m-commerce in developing economies compared to western ones. This study further combined theories within and across disciplines to develop an integrated m-commerce activities adoption model. Integrating theories and models allows accounting for phenomena that neither can address independently. Therefore, technology adoption theory, consumer decision-making styles model, and social network theories guided this study and developed the study's conceptual model. Unlike previous studies, which focused on whether individuals adopted m-commerce or not, this study looked at m-commerce adoption more broadly from the activities individuals engage in (i.e., content delivery, transactions, and entertainment). A conceptual model was developed and empirically tested. Structural equation modeling (SEM) analysis revealed that mobile-phone users' roles as

technology-users, consumers, and social network-members influence the adoption of m-commerce activities.

The significant theoretical contribution of this study is the development of a conceptual model. This model provides a more comprehensive understanding of the adoption determinants that influence mobile-phone users' intentions and decisions towards adopting m-commerce activities from the perspective of their roles using mobile-phones. This research addresses the knowledge gap that exists in m-commerce adoption in developing economies literature. Furthermore, the approach utilized in the present study contributes to the multi-disciplinary approach to IS inquiry by drawing on concepts and theories from reference disciplines.

Likewise, the study results have implications for practice. First, the study underscored the significance of the roles of mobile-phone users as they engage with mobile technologies. In addition to mobile-phone users being technology users who engage with complex technology while conducting m-commerce activities, m-commerce providers, developers, and designers need to be cognizant that mobile-phone users are consumers. They pay and make purchase-related decisions when they engage in m-commerce activities. Furthermore, mobile-phone users are also social network-members who engage with other network members, influencing them to adopt a technology. Therefore, familiarity by m-commerce providers, developers, and designers with mobile-phone users' roles while performing m-commerce activities is essential. This allows the development and deployment of suitable m-commerce solutions, bearing in mind the roles individuals play when using mobile-phone devices.

Future studies should look at how different types of m-commerce activities (content delivery, transactions, and entertainment) are specifically appropriated and used. For example, what specific entertainment activities do mobile-phone users engage in, such as streaming movies, listening to music, and playing online games? In what way are these specific entertainment activities appropriated and used? This can provide a better understanding of how the specific activities are adopted and used. Users' demographics are used to segment markets. It will also be important to understand how users' demographics influence the adoption of m-commerce activities. Future studies can also test this model in other developing countries. Last but not least, this study may not have considered other significant variables, and future studies may include other variables to improve the model further.

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CHAPTER ONE: INTRODUCTION

1.1. Background and Problem Statement

Information technology and the advent of the internet have transformed commerce over the past few decades (Dzogbenuku, 2013; Catchapero & Park, 2010). The arrival and growth of mobile technologies have further moved the boundaries of how business transactions are conducted, i.e., the emergence of mobile commerce (m-commerce). According to Pousttchi et al. (2015), M-commerce presumes the mobility of devices and users. It provides mobility of services between devices that offer information and location services that enable and support business transactions without time and space constraints. Mobility afforded by mobile technology devices gives new perspectives and requirements for business transactions, bringing convenience and some new considerations for its implementation to offer reliable, effective, and efficient transactions. Advantages afforded by mobile technology, such as ubiquity and immediate access to information, paired with broad reach, are indisputable (Wei, Marthandan, Chong, Ooi, & Seetharam, 2009). The rapid growth of m-commerce seems assured given the mass adoption of mobile technology devices such as the mobile-phone worldwide. Estimates show over five billion unique mobile-phone subscribers worldwide (GSMA, 2020). This broad reach of mobile-phone devices has surpassed that of traditional information technology (IT) the personal computers (PCs), and according to Statista (2020), m-commerce retail revenue globally is estimated to reach \$3.56 billion, up from \$1.36 billion in 2017.

Researchers have highlighted the potential of m-commerce in developing economies (Cullen & Kabanda, 2018; Verkijika, 2018; Joubert & Van Belle, 2013). Cullen and Kabanda (2018) posit that due to the contextual characteristics of these countries, m-commerce could potentially transform their economies. Developing economies are experiencing a growing smartphone penetration, rapid progress in mobile technology and services, and several services being accessed on mobile devices such as instant messaging, m-banking, and m-payments (Kakihara 2014; Kreutzer 2009). However, the actual use of m-commerce applications for business transactions remains low (Dakduk et al., 2020; Cullen & Kabanda, 2018; Verkijika, 2018; Ashraf et al., 2017; Chong et al., 2012; Lin, 2011).

Several researchers have undertaken to study m-commerce adoption phenomena (Cullen & Kabanda, 2018; Verkijika, 2018; Ashraf et al., 2017; Pousttchi et al., 2015; Gitau & Nzuki, 2014; Chong et al., 2012; Khalifa et al., 2012). Pousttchi et al. (2015) argue that m-commerce studies have re-applied theory and methodologies developed by IS researchers who studied earlier waves of technology (for example, diffusion models, technology acceptance model, motivations for use). However, they have not accounted for mobile-phone users' roles when using mobile devices in their daily activities. The present study seeks an effort to extend the body of knowledge in m-commerce adoption by extending established adoption theories to account for the different roles played by mobile-phone users. The roles individuals play in their day-to-day business activities while using mobile-phones influence m-commerce adoption. Lattimore et al. (2004) and Widdowson (1987) describe the “role” as a part people play in the performance of social life. Individuals can take on multiple roles simultaneously, and today some of the roles individuals play are performed through mobile-phone devices to accomplish day-to-day activities. According to Allen and Vliert (1984), individuals' role(s) can influence behavior. Depending on the role(s) played at the time, they can influence how individuals might adopt technologies and services such as m-commerce.

Previous studies have tried to understand mobile-phone users from their role as a technology-user (Mashagba et al., 2013; Bhatti, 2007; Joubert & Van Bella, 2009; Chong, 2013). However, these studies do not give a holistic view of mobile-phone users, limiting our understanding of their behavior about other roles they play through mobile-phones. Therefore, for this reason, the present study focuses on the role(s) individuals play using mobile-phones more broadly, i.e., different roles in addition to that as a technology user.

1.2. Why it is important to study m-commerce adoption

Individuals have become increasingly dependent on mobile technologies such as the mobile-phone to access content and services (Ali et al., 2019; Cullen & Kabanda, 2018; Pandey & Chawla, 2019; Alqatan et al., 2011). Therefore, studying m-commerce adoption is essential in the present-day world. The ability to access content and other services anytime, anywhere, and when needed is more crucial, as the use of m-commerce becomes imperative where individuals would like to complete business transactions on the go. M-commerce is the next phase after the success of electronic commerce (e-commerce) with a profound effect on business structure and

industry, similar to, if not bigger than, e-commerce (Cullen & Kabanda, 2018; Kabanda & Brown, 2017; Kabanda & Brown, 2015) and society as a whole and in particular in Africa. As mobile technologies have become increasingly available to individuals, m-commerce has created new frontiers and opportunities. For example, in developing economies, m-commerce allows small and medium-sized businesses to reach customers in rural areas (Mwangi & Brown, 2014; Wei et al., 2009; Boadi et al., 2007). This can reduce the cost of doing business primarily in most rural areas that are not easily accessible by road and outside the commercial power grid (GSMA, 2013). It is a tool that bridges the digital divide among a population that has long been deprived of the information necessary to steer it forward in social and economic development (Mimbi et al., 2011). M-commerce has leapfrogged most low-income communities from previous expensive technologies such as computers and infrastructures like automatic teller machines (ATM) and electronic cards (Porteous, 2006a). Therefore, m-commerce has had a transformational impact on society, profoundly influencing individuals' living patterns (Dakduk et al., 2020; Duncombe & Boateng, 2009; Boadi et al., 2007).

In developed economies, m-commerce as a wave happened in succession (almost linearly) to earlier waves – the PC, internet, and e-commerce. In the case of Africa and most developing economies, there has been a “leap-frog” effect in context since mobile technology is the first real internet technology that most consumers have adopted, with no prior experience with earlier waves of technology (Porteous, 2006a; Cagle et al., 2006). This may have impacted perceptions about technology and, hence, its adoption. Individuals are becoming increasingly dependent on mobile technology, which is virtually indispensable for daily activities (Dongmo et al., 2020). For example, individuals have always maintained relationships, but they are doing so in a new way through mobile-phones. According to Kusimba et al. (2013), these technologies allow users to create new forms of social and communal life. Users of mobile-phones can share risks and smooth uneven incomes (Jack & Suri, 2011).

On the other hand, others exploit mobile-phones through social relations to create wealth for themselves (Morawczynski, 2008). Mobile technologies can also exclude others from network relationships, especially those who may not be reached through mobile technologies (Gergen, 2010). Thus, mobile technology adoption is expected to bring both intended and unintended

consequences (Mwangi & Brown, 2014; Kabanda & Brown, 2017). These consequences can, in turn, determine how individuals adopt m-commerce.

Studies on technology adoption by individuals began with an interest in understanding technology adoption in the organization (Venkatesh & Brown, 2001; Lyytinen & Yoo, 2002b; Scheepers & Scheepers, 2004; Kim et al., 2007), leading eventually, after years of research and theoretical interrogation to the development of the Unified Theory of Acceptance and Usage of Technology (UTAUT) (Venkatesh et al., 2003). Technology adoption outside the workplace has since grown substantially. Venkatesh and Brown (2001) pioneered studying technology adoption outside the workplace. They posited that factors affecting workplace technology adoption differ from those outside a work setting, leading to the development of frameworks such as UTAUT2 (Venkatesh et al., 2012). Since then, many more studies have progressed on individual technology adoption. Meso et al. (2005) advanced the need for more studies to be conducted to progress m-commerce, especially in developing economies. According to Omonedo and Bocij (2014), m-commerce is now more accessible in developing economies because infrastructure problems are minimal. Anyone can start engaging in m-commerce using basic mobile-phones.

Much of the m-commerce research focus has been on technology characteristics, in line with the early stages of a technology development. However, as the study area matures, the focus shifts to issues regarding users' experiences (Chong et al., 2011; Ngai & Gunasekaran, 2007). According to Verdegem and De Marez (2011), it is crucial to broaden our understanding of the factors influencing new and emerging technology adoption from the user's perspective. Therefore, the present study focuses explicitly on mobile-phone users from the roles they play in their day-to-day activities to help us better understand and explain m-commerce adoption. Many m-commerce adoption studies are from the technology-user role perspective (Khalifa et al., 2012; Chong et al., 2011; Huo et al., 2011; Catchapero & Park, 2010). However, few have considered other unique roles of mobile technology users, such as consumers or social network members. Therefore, understanding mobile-phone users only as technology users do not give us a holistic view, limiting our understanding of other roles they play through mobile-phone devices and influencing them to adopt m-commerce.

1.3. Studies Addressing the Problem

Literature shows that several studies on m-commerce adoption have been carried out in several countries (Dongmo et al., 2020; Cullen & Kabanda, 2018; Gitau and Nzuki; 2014; Boadi et al., 2007; Chong et al., 2012; Hung, Ku & Chang, 2003; Khalifa & Shen, 2008; Wei et al., 2009, Pavlou et al., 2007). These studies have used traditional technology adoption theories and models to understand what influences individuals to adopt m-commerce. Some studies on m-commerce adoption have, by way of example, focused on technology characteristics using the diffusion of innovations theory (DOI). According to Ngai and Gunasekaran (2007), technology characteristics studies dominate the early stages of technology. The second set of studies focused on the users' behavior using the theory of planned behavior (TPB). In contrast, the third round of studies has focused on the user's instrumental beliefs using the technology acceptance model (TAM). Finally, another set of studies has combined two or more of these theories and extended them by adding other constructs to understand better m-commerce adoption phenomena (Chong et al., 2012).

1.3.1. Deficiencies in these studies

Studying m-commerce adoption using traditional adoption models and theories has limitations (AlHinai et al., 2007; Wei et al., 2009). Existing traditional technology adoption theories and models used to study m-commerce adoption consider mobile technology users (individuals) playing the technology-user role. However, individuals take on multiple roles simultaneously when using mobile-phones in day-to-day activities. These roles influence individuals' behavior depending on the role(s) played at the time. As roles influence behavior, this may affect how individuals might adopt technologies and services such as m-commerce. Therefore, traditional adoption theories and models do not consider that mobile technology users play more than the technology-user role. Also, they are consumers playing the consumer role; furthermore, while interacting with others to seek and get information, help, and or advice, they play the social network-member role (Rajabion, 2015, Huo et al., 2011; Catchapero & Park, 2010; Alhinai et al. 2007; Pedersen et al. 2002).

Available literature shows that most studies have been done to understand individuals adopting m-commerce as technology users (Rajabion, 2015, Huo et al., 2011; Catchapero & Park, 2010; Alhinai et al., 2007; Pedersen et al., 2002). However, few studies have tried to investigate m-

commerce adoption by individuals from the perspective of the multiple roles they play in a single study. Therefore, literature and theoretical works have not comprehensively addressed the roles of individuals and how they influence m-commerce adoption.

Most m-commerce studies have focused on whether individuals will adopt the technology or not. However, researchers have shown that m-commerce is used for various activities such as making business and financial transactions, entertainment, information and product seeking, location-based services, and mobile advertising (Cullen & Kabanda; 2018; Kalinic & Marinkovic, 2016; Rahman, 2013; Chong, 2013). Thus, the need to more broadly understand how users adopt particular m-commerce activities.

1.4. Significance of the study

There is a lack of a holistic view in the literature regarding the roles that individuals play through mobile technologies to influence the adoption of m-commerce. The present study seeks to bridge this gap by examining mobile-phone users' roles to understand better how they influence individuals towards adopting m-commerce. The study also examines how individuals in different roles adopt various types of m-commerce activities, which in this study are the actions of consumers with mobile devices and include (but are not limited to) content delivery, entertainment, and transactions. Researchers have defined content delivery as mobile technology devices to perform m-commerce-related activities such as surfing to search for information. Transactions are about performing a financial exchange between customers and businesses using mobile technology, and entertainment is the use of mobile devices to listen to music, watch videos, or play games online (Cullen & Kabanda; 2018; Chan & Chong, 2013; Chong et al., 2012; Rahman, 2013; Ngai & Gunasekaran, 2007).

This study's conceptual model and findings contribute to the body of information systems (IS) knowledge regarding m-commerce activities adoption by re-examining m-commerce adoption with a fresh lens using the notion of the "roles" played by mobile-phone users.

According to Lee (1999), the value of IS research is its effort to understand complex phenomena where users, technology, and social setting interact and transform each other. In response, this study looks at the roles individuals play using mobile-phones for socialization and commerce activities as they interact with technology in their social setting. Findings from the study will

enable researchers and businesses to understand better how mobile-phone users are influenced to adopt m-commerce while interacting with mobile-phones. As a result, business managers and marketers can formulate strategies to exploit the already available advantages of m-commerce opportunities to enhance their businesses and return on investment through m-commerce platform investments. It will also guide developers in creating effective, user-friendly mobile sites and apps and aiding governments in economic planning and commerce in their countries.

1.5. The purpose and objectives of the study

The present study aims to examine the roles of mobile-phone users and how these roles influence individuals towards adopting m-commerce activities. What drives the adoption of m-commerce in developing economies remains obscure, as evidenced by competing/conflicting findings in m-commerce adoption studies. Little is still known about the roles mobile-phone users play and how they influence the adoption of m-commerce activities (content delivery, entertainment, and transaction) in such contexts. Moreover, there is no holistic view of the user's experiences through their roles using mobile technologies. Accordingly, researchers have argued that the mere proliferation of mobile technologies may not be enough to guarantee individual m-commerce adoption, especially in developing economies, but how individuals appropriate the technology could be a key factor (Dakduk et al., 2020; Cullen & Kabanda, 2018; Pipitwanichakarn & Wongtada, 2018). This study focuses on three m-commerce activities (i.e., content delivery, entertainment, and transaction). These are typical m-commerce activities that mobile-phone users in developing economies are currently engaged in while using mobile-phones in their daily activities.

Therefore, the objectives of the present study are as follows:

- (i) To examine the roles mobile-phone users play and their influence on adopting m-commerce activities in a developing economy context.
- (ii) To develop a model that explains the influence of the roles mobile-phone users play on the adoption of various m-commerce activities.
- (iii) To test and validate this study's m-commerce activities adoption model.

1.6. Research Questions

Given the deficiencies of m-commerce adoption studies outlined in the previous section and the gaps in IS research, this study sets out to answer the following research questions.

1.6.1. Primary Research Question

How do the roles mobile-phone users play influence m-commerce activities adoption in a developing economy context?

1.6.2. Secondary Research Questions

1. What influence does the technology-user role of a mobile-phone user have on the adoption of m-commerce activities?
2. What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?
3. What influence does the social network-member role of a mobile-phone user have on the adoption of m-commerce activities?

1.7. Scope of the Study

Given that m-commerce adoption research is broad, this study focused on individual user adoption as the unit of analysis in a non-work setting instead of the adoption by organizations and businesses. It also focused on voluntary adoption and use by individuals instead of mandatory adoption by management in an organization. The study also focused on whether individuals adopted m-commerce activities (content delivery, transactions, and entertainment) instead of from a general perspective on why they did or did not adopt m-commerce. M-commerce technologies included in this study are those that provide individuals mobility, immediacy, and ubiquity (Omonedo & Bocij, 2014). The study excludes technologies that support businesses to provide m-commerce. Further, the study looks at m-commerce as opposed to m-business. According to researchers, m-commerce involves a narrower set of activities compared to m-business despite sharing specific characteristics such as mobility (Lian & Xiu-zhen (2010); Ning et al., 2010; Tiwari & Buse, 2007).

The specific developing economy context chosen for the study is Kenya. Kenya is chosen because, over the last two decades, it has undergone rapid ICT sector growth. This growth is attributed to the digitization of private businesses and government services, leading to Kenyans'

continuous increased use of ICT services, including un-served and under-served areas. ICT sector growth has averaged 10.8% annually since 2016 (World Bank, 2019). Today, Kenya's mobile-phone subscriber base penetration stands at over 103% of the total population (Statista, 2021); compared to less than 3% of Kenyan households owning a fixed-line telephone and fewer than 1 in 1,000 adults having a mobile-phone in the late 1990s (Demombynes & Thegeya, 2012). Similarly, in a developing country, Kenya has had one of the most successful person-to-person (P2P) mobile money transfer services, with rapid m-banking and m-payments developments.

1.8. Limitation of the Study

The study may not have captured new developments that may have happened since its design and data collection. For example, a cross-sectional study design employed in this study may not have captured the differences in users' changing behavior, values, and beliefs over time and technology changes. Also, the study did not use mobile-phone users' demographics to understand their influence on m-commerce activities adoption. Neither did it use the demographics as a moderator between mobile-phone users' roles and m-commerce activities adoption. Finally, this study did not look at the adoption of each of these specific m-commerce activities, though researchers have indicated that individuals adopt them for various reasons.

1.9. Contributions of the study

This study revealed a few interesting implications for research and practice.

1.9.1. Theoretical contributions

This research addresses the gap in the m-commerce adoption literature and adds to the IS field body of knowledge. First, technology adoption studies previously have not considered technology users as individuals with multiple roles. This non-consideration is largely because most IS adoption studies have been done from the organizational perspective, where users of a technology in the organization did not incur a cost of using the technology. Technology adoption outside the workplace by individuals pioneered by Venkatesh and Brown (2001) is an evolving area of study. This study has shown from literature and empirically that adopters of m-commerce and related activities are consumers, hence playing the consumer role, a new perspective in m-commerce research.

Second, most m-commerce studies have not addressed the social network(s) individuals are involved in. A social network comprises sets of actors, dyadic ties, and other social interactions between actors (Wasserman & Faust, 1994). This study has empirically shown that an individual's social network(s) influence the adoption of m-commerce activities. Therefore, the study has broadened our understanding of the importance of the social network-member role in m-commerce activities adoption.

Third, this research adds to the limited quantitative studies on m-commerce activities adoption related to transactions, entertainment, and content delivery. Many m-commerce adoption studies have been done from a general perspective that has looked at whether individuals have or not adopted m-commerce. Users adopt various m-commerce activities differently; hence, not distinguishing between them can impact our understanding of how the various m-commerce activities are adopted.

Finally, this study is positioned in a developing economy context with different characteristics than developed economies.

Therefore, the significant theoretical contribution of this study is that it has advanced our understanding of m-commerce activities adoption — that is, content delivery, entertainment, and transactions — from the perspective of the roles mobile-phone users play — that is, the consumer, technology-user and the social network-member roles. Integrating these roles in this study makes a significant, value-added contribution to the current thinking on how individuals adopt m-commerce activities. The study also proposes an integrated m-commerce activities adoption model and has empirically validated the model.

1.9.2. Practical Contributions

The findings of this study provide several practical contributions. First, this study argues that it is not sufficient to study whether individuals adopt m-commerce or not. Understanding individuals' m-commerce adoption patterns concerning the types of m-commerce activities — content delivery, transaction, and entertainment — is important. Thus, allowing providers and developers to come up with approaches and develop applications that support specific m-commerce activities.

Second, from the study's findings, an individual's social network(s) influences m-commerce activities adoption. Thus, m-commerce providers can formulate strategies to promote m-commerce activities through individuals' social networks, such as using word-of-mouth.

Third, this study underscores the importance of the consumer role of a mobile-phone user in m-commerce activities adoption. The mobile-phone user consumer role is a new perspective in m-commerce research, and as such, understanding the changing role of a mobile-phone user from the consumer perspective is essential. Furthermore, understanding m-commerce adopters as consumers can help marketers determine how to position products and services on m-commerce activities platforms.

1.10. Philosophical underpinnings of the study

This study adopted a positivist stance, which holds a deterministic philosophy that the problems studied to assess the causes that influence the outcome and reality exists out there, and knowledge is developed through observation (Creswell, 2009). This philosophical underpinning assists in answering the research questions posed in this study. Also, given that the aim of this was to find causal relationships that predict individuals' behavior towards the adoption of m-commerce activities, the study developed and tested a model to determine the relationship between the independent variables (technology-user role, consumer role, and social network-member role) and the dependent variable m-commerce activities (content delivery, entertainment, and transaction). The positivist approach was the most suitable for the execution of the study.

1.11. Definition of Key Concepts/Terms

The following comprises definitions of key concepts and terms as discussed in this study. However, detailed discussions of the same concepts are given in their respective sections, and at the same time, other concepts will be defined as the study progresses.

M-commerce – Any transaction that is initiated and – or possibly – completed to purchase goods and services using a mobile device (also to search for information, evaluate product and services alternatives, and perform actual purchases) and to provide post-purchase feedback on goods and services acquired (Omonedo & Bocij, 2014). This study also considers the use of mobile devices

that are not connected to the internet that can initiate and complete m-commerce transactions through short messaging services (SMS).

M-commerce Activities – M-commerce activities are the “actions or things individuals do with mobile devices and include (but are not limited to) browsing the internet for information; playing video games; completing business or financial transactions, etc.” (Chan & Chong, 2013). This study covers three types of activities: (a) content delivery, (b) transaction, and (c) entertainment.

Content delivery – deals with using mobile devices to search for information, send/receive emails, read/receive news, and search the internet for content (Chan & Chong, 2013).

Transaction involves using mobile devices for payment transactions, banking, and the transfer of money between individuals and businesses (Chan & Chong, 2013).

Location-based – involves using mobile devices for offers/coupons related to shopping and personal advertisements or notifications from marketers – receiving time-sensitive information such as discount tickets and personal advertisements (Chan & Chong, 2013).

Entertainment involves using mobile devices to play games and listen to music (Chan & Chong, 2013).

Role – A part people play in the performance of social life (Lattimore et al., 2004; Widdowson, 1987).

Consumer Role – The use of a mobile-phone device to purchase goods and services, thus making individuals go through a decision-making process while making payments and acquiring goods and services using a mobile-phone (AlHinai et al., 2007).

Technology-user Role – Using and engaging with mobile-phone devices and other information technology devices (AlHinai et al., 2007).

Social Network-member Role – Interacting with other social network member(s) through the mobile-phone (AlHinai et al., 2007).

1.12. Structure of the study

The organization of this study is as follows:

Chapter One – Introduction

This chapter presents the background and problem statement to the study and why it is crucial to study the adoption of m-commerce activities, which have addressed the problem and deficiencies in these studies. The chapter looks at the significance of the study, its purpose and objectives, the research questions, scope, limitations, delimitations, the contributions the study makes, the philosophical underpinnings, and the structure of the present study.

Chapter Two – Literature Review

This study's literature review is divided into two parts. The first part starts by giving Kenya's socio-economic, political, and technological trends, and the second part looks at m-commerce, m-commerce empirical studies, and the knowledge gap.

Chapter Three – Theoretical Perspective

This chapter develops this study's research framework. It examines how the roles mobile-phone users play influence them to adopt m-commerce activities. For example, mobile-phone users play technology-user, consumer, and social network member roles. The study further conjectures that the main m-commerce activities likely to be adopted in a developing economy are content delivery, entertainment, and transaction. Therefore, this chapter starts by developing the study's conceptual model, and the research hypotheses are presented.

Chapter Four – Research Methodology

The research methodology chapter starts by giving an overview of the information systems discipline and research. This is followed by discussing social science research's philosophical foundations and how information systems research is related to social science inquiry. The chapter further looks at the three widely used research philosophies (paradigms) in information systems inquiry and the choice of the research philosophy for the present study. This is followed by the research design processes, data collection and analysis of data, and questionnaire development process. Finally, ethical issues observed when executing this study are highlighted. The chapter concludes by presenting a summary of the discussions in this chapter.

Chapter Five – Data Analysis and Results

This chapter presents preliminary data analysis giving descriptive statistics of the study's respondents. Next, the independent sample t-test and ANOVA were presented on the respondents' demographics to identify possible differences between respondents in this study about m-commerce activities adoption. This is followed by PLS-SEM results testing the study's hypotheses and validating the conceptual model.

Chapter Six – Discussion

In this chapter, this study presents an interpretation of the results as well as discussions around the findings.

Chapter Seven – Conclusion

This chapter presents the study's conclusion. This study's research contributions, followed by limitations, and suggestions for future research, close the chapter.

CHAPTER TWO: LITERATURE REVIEW

2.1. Contextual Background and Literature Review

Given the choice of Kenya as the empirical site for data collection, this chapter gives Kenya's socio-economic, political, and technological trends to show the relevance and persistence of the research problem in this context (Ngwenyama, 2019). Further, the chapter looks at m-commerce, m-commerce empirical studies, and the knowledge gap.

2.2. Background Information on Kenya

Located in the East Africa region, Kenya is a developing country. The 2019 population and housing census results indicated that its population stands at 47.6 million, up from 37.7 million in 2009 (KNBS, 2019). In 2010, Kenya promulgated a new constitution ushering in a new political and economic governance dispensation. Thus, several economic, structural, and political reforms have been undertaken over the last decade, leading to sustained economic, social, and political gains. According to a development indicator report by the World Bank, Kenya's economy grew in 2019 at an average of 5.7% (World Bank, 2020). This growth makes Kenya's economy one of the fastest-growing in Sub-Saharan Africa. Under the social developments, the report further indicated that Kenya met several of its Millennium Development Goals (MDGs) targets, namely reduced child mortality, near-universal school enrolment, and narrowing of gender gaps in education, among others. In addition, the growth of the Information and Communications Technology (ICT) sector has averaged 10.8% annually since 2016, becoming a significant source of economic development and job creation with spillover effects in almost every sector of the economy (World Bank, 2019). However, the World Bank development indicator report (2020) points out that poverty, inequality, climate change, weak private sector investment, and an economy vulnerable to internal and external shocks pose critical economic challenges.

2.2.1 Kenya's e-Readiness and ICT Development Trends

Over the past few years, ICT has rapidly evolved and spread worldwide with wide use in sectors such as education, entertainment, agriculture, health, and the economy (Rena, 2011). As a result, many countries see ICT as the key driver of economic growth. However, the pace with which

economies adopt ICT varies, and ICT access is still a big challenge for low-income economies. Kalui (2019) cites studies that have shown a lack of uniform use of ICT-enabled services within and across countries, particularly in the financial sectors that cannot utilize, implement and use novel and state-of-the-art ICT and other ICT-enabled services. According to Kalui (2019), this is attributed to differences in e-Readiness in ICT adoption, resource availability, and lack of expertise in technology. According to WorldAtlas (2019), e-Readiness of a country is defined as "the ability of a state to utilize information and communication technology (ICT) for sustainable welfare and development." WorldAtlas (2019) further says that e-Readiness measures the extent and quality of ICT infrastructure, e-skills, and relevant regulations. Several e-Readiness assessments have been performed in Kenya, and these are in higher education (Kashorda and Waema (2014), microfinance institutions (MFIs), e-Readiness (Kaluki (2019), and eTrade readiness assessment (UNCTAD, 2022), among many other assessments. The following section looks at ICT trends in Kenya to justify the country's e-Readiness.

In some respects, progressive developments have taken place in the Kenyan ICT sector. Key developments in the sector include increased convergence of broadcasting and telecommunications, increased bandwidth via access to new undersea cables, and implementation of the National Optic Fibre Backbone Infrastructure (NOFBI) project (Waema & Ndung'u, 2012). The landing of the undersea cables brought high consumer expectations, with improved internet access and quality. Kenya's ICT development journey can be traced back to 1998 with the introduction of the Kenya Information and Communications Act of 1998. This Act reformed the operations of the state-run Kenya Posts and Telecommunications Corporation (KPTC) by splitting the monopolistic corporation into five separate entities (Waema & Ndung'u, 2012):

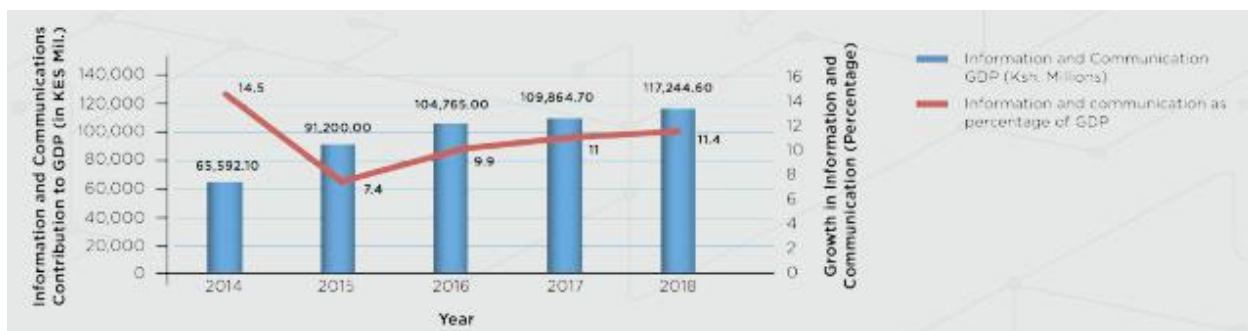
- i. Postal Corporation of Kenya (Posta), the state-run body corporate that provides the country's postal services
- ii. Telkom Kenya Limited (TKL), a fixed-line services state corporation and
- iii. Communications Commission of Kenya (CCK), the sector regulator.
- iv. The National Communications Secretariat (NCS) to advise the government on the adoption of a communication policy; and
- v. The Appeals Tribunal arbitrates in cases where disputes arise between parties.

The 1998 Kenya Information and Communications Act has since been revised and amended twice, in 2010 and 2013, to align with Kenya's new constitution of 2010, which provided freedom of expression and the media. The 2010 and 2013 revisions of the Kenya Information and Communications (Amendment) Act provide these freedoms enshrined in the constitution. The legislation also established a regulatory body - the Communications Commission of Kenya (CCK), now the Communications Authority of Kenya (CA) - which was to be independent of political, commercial, or government interests. The Communications Authority of Kenya (CA) is responsible for facilitating the development of the information and communications sectors, including; broadcasting, cyber security, multimedia, telecommunications, postal, courier services, and e-commerce (CA, 2020). Therefore, as mentioned earlier, the Acts provide a broad framework for regulating Kenya's information and communications sector.

Over the last two decades, Kenya has gone through rapid ICT sector growth following the abovementioned reforms. However, the ICT sector growth has been on an upward trend since 2014, while its contribution to Kenya's GDP remained at 1.3%. This growth is attributed to increased digitization of private business and government services, continuous uptake of ICT services by Kenyans, and increased rollout of services to un-served and under-served areas. Table 1 below shows the trend in the contribution of ICT against GDP in Kenya between 2014 and 2018. Further, Kenya unveiled the Digital Economy Blueprint (2019), a framework that will guide Kenya and Africa in leapfrogging its economic growth by leveraging ICT (CA, 2019). The Digital Economy Blueprint (2019) is anchored on five pillars: Digital Government, Digital Business; Infrastructure; Innovation-Driven Entrepreneurship, and Digital Skills and Values.

Table 1: Economic Survey 2019

Indicator	2014	2015	2016	2017+	2018*
Population (Millions)	43.0	44.2	45.4	46.6	47.8
GDP at market prices (KES Billion)	5,402.6	6,284.2	7,022.9	8,144.4	8,905
Growth of GDP at market Prices (Per cent Growth)	5.4	5.7	5.9	4.9	6.3
GDP Per Capita at Constant Prices (KES)	89,430.3	91,988.6	94,797.3	96,787.7	100,310.3
Transport and Storage GDP at Current Prices (KES Millions)**	462,457	510,488	565,829	607,503	711,352
Information and Communication GDP (KES Millions)	65,592.1	91,200.0	104,765.0	109,864.7	117,244.6
Information and Communication as Percentage of GDP	1.2	1.5	1.5	1.3	1.3
Percentage Change in Information and Communications at market prices (Per cent)	14.5	7.4	9.9	11.0	11.4
Private sector wage employment in information and communication ('000)	102.7	109.7	115.2	122.4	129.3
Public Sector Wage Employment in Information and Communication ('000)	1.8	1.9	1.9	1.9	1.9
Consumer Prices, Annual Average [Index Numbers February 2009=100]	149.7	159.6	169.7	183.2	191.8
CPI Annual Inflation Rate (Overall) %	6.9	6.6	6.3	8.0	4.7



Source: Communications Authority of Kenya

The Communications Authority of Kenya (CA) introduced competition in the mobile cellular industry to compete with Telkom Kenya, thus, opening up Kenya’s ICT market structure and players. Today, there are five cellular phone operators, Airtel Networks Kenya Ltd., Safaricom PLC, Telkom Kenya Ltd., Mobile Pay Ltd., and Finserve Ltd., with a total mobile telephony subscriber base of 52 million (CA, 2019). Internet services have been driven by an increase in mobile, satellite, fixed fiber-optic, and fixed cable modem subscriptions. However, there was a reduction in terrestrial wireless subscriptions, with mobile data internet dominating data internet subscriptions. As a result, the total broadband service subscriptions have grown to 22.2 million,

up from 20.5 million recorded in 2017/2018, with mobile and fixed broadband subscriptions dominating.

2.2.2 Mobile-Phone Technology Trends

The mobile-phone is one of the fastest adopted innovations globally in recent years. In 2009, there were over 4.6 billion mobile-phone subscribers worldwide (ITU, 2011), which increased to 4.8 billion unique subscribers by the end of 2016, representing two-thirds of the world's population. By 2019, there were 5.1 billion unique mobile-phone subscribers, representing a global penetration rate of 66.9% (GSMA, 2020). The GSMA (2020) report further projects 5.8 billion subscribers by 2025, representing a 70% penetration. However, the report shows that it is becoming increasingly difficult for mobile operators to add new subscribers since markets are becoming saturated with a challenging financial climate. As a result, it is proving more difficult for mobile operators to make an economic justification to reach more subscribers, especially those in rural areas. Hence, this will continue to increase the digital divide between rural and urban dwellers.

According to Jack and Suri (2011), more people have embraced mobile-phones than any other technological innovation in recent times. Innovations such as fixed telecommunication lines, the internet, radio, personal computers, and railways took a long time to penetrate countries' populations compared to the mobile-phone. Mobile-phone adoption has also seen many developing economies bypass previous generation infrastructures such as automatic teller machines (ATM) and electronic point-of-sale (Porteous, 2006).

Initially, the mobile-phone was developed for voice communication (Coursaris & Hassanein, 2002). Today, it has been adopted for other innovative uses. For example, the mobile-phone is today used to perform many functions. These functions include sending text messages, accessing the internet, transferring money, making payments, performing banking transactions, and paying for goods and services. At the same time, the mobile-phone has become a wallet for savings. The development of creative and innovative applications running on mobile-phone devices has made it possible to perform many of the activities mentioned above. These applications facilitate commerce transactions over mobile-phone devices. Subsequently, the development of several different types of applications has allowed a broad range of business functions to be conducted (Khalifa & Cheng, 2002). Mobile banking applications, for example, are used to offer banking

services such as mobile transfer of money from one account to another, check balances, order for a checkbook, and issue stop-payment instructions.

On the other hand, mobile money transfer applications allow person-to-person (P2P) money transfer, while m-payment applications make it possible to pay for goods and services. Today, the mobile-phone enables payment for electricity, water, grocery, hospital bills, and a broad range of goods and services. Therefore, mobile-phone capability to facilitate commerce has heralded mobile commerce (m-commerce), commerce conducted without time and space constraints.

The rise in mobile-phone use, especially by low-income earners in developing economies to transfer money using the person-to-person (P2P) money transfer application, has become popular given the efficacy to move money from one place to another without the handicap of time and space. P2P mobile money transfer allows for a fast, safe, secure, and cheaper way of transferring money, surpassing any previously available P2P money transfer method. Mobile money platforms have given rise to mobile banking. Mobile banking has made banking services and other economic transactions accessible to populations that would not have otherwise been accessible or reachable. According to Solin and Zerzan (2010), access to mobile-phones has enabled quick access to mobile money financial services, evident in developing economies, particularly in Kenya.

2.2.3 Mobile-Phone Landscape in Kenya

A mix of technologies are used to support mobile-phone networks in Kenya, and these different technologies result from limitations posed by users' devices (Barorot, 2018). Kenya's entry into mobile technology can be traced back to the late 1990s. Analog first-generation (1G) mobile technology pioneered the country's mobile network. The 1G technology only supported voice communication. The country later transitioned to second-generation (2G) technology Global System for Mobile (GSM) networks supporting primarily voice, and through the GPRS and EDGE technology, enabling data capability at low speeds. The 2G technology is still in operation in certain parts of the country, and its successor is the third-generation network (3G), which primarily supports voice and data. The 3G network is the dominant network in Kenya today. The fourth-generation/Long-Term Evolution (4G/LTE) network has succeeded in the above technologies. This technology is for data and does not carry voice; thus, users can experience

smoother live streaming, faster downloads and uploads, and video and audio content sharing. The 4G network, thus, falls back to 2G and 3G networks for voice. The 4G network is capable of delivering speeds that are five times faster than the 3G network. Telcos in Kenya are increasingly rolling out the 4G network (CA, 2019).

Table 2 below shows the growth in deployment of 2G, 3G, and 4G transceivers from 2014 to 2019. The 2G and 3G transceivers have increased marginally to 161,867 and 66,990 from 154,250 and 53,557, respectively, in 2019. The 4G transceivers doubled to 17,744 from 7,469 in 2018/2019 (CA, 2020).

Table 2: 2G, 3G, and 4G transceivers deployment in the country

Operator	Technology	2014/15	2015/16	2016/17	2017/18	2018/19
Telkom Kenya Ltd	2G	7,631	8,594	13,571	16,162	13,701
	3G	3,192	3,813	4,945	8,018	8,230
	4G	-	-	-	-	1,637
Airtel Networks Kenya Ltd	2G	16,811	18,848	18,407	23,060	25,744
	3G	1,892	5,235	6,580	7,752	12,118
	4G	-	-	255	1,260	2,844
Safaricom Limited	2G	65,552	65,120	105,582	115,028	122,422
	3G	14,216	21,770	31,191	37,787	46,642
	4G	-	-	3,618	6,209	13,263
Total Number of Transceivers	2G	89,994	92,562	137,560	154,250	161,867
	3G	19,300	30,818	42,716	53,557	66,990
	4G	-	-	3,873	7,469	17,744

Source: Communications Authority of Kenya

Kenya operates 900Mhz and 1800Mhz GSM bands like most European carriers. The network supports GPRS, EDGE 3G, and 4G services. In 2007, Safaricom's first third-generation license was granted to install and operate 3G systems and services (Waema & Ndung'u, 2012). Furthermore, later it acquired a 4G license in 2017. The other operators are now rolling out 4G services, mainly in the main towns. Most of the mobile-phone technologies in Kenya are not yet as sophisticated as in developed economies. Most mobile-phones, close to 60%, are basic/feature

phones with commerce done through short message service (SMS) and unstructured supplementary service data (USSD) sessions (World Bank, 2012).

Mobile-phone ownership today throughout Africa is notable. The number of mobile-phones leapfrogged the number of landline telephones, allowing more individuals on the continent to engage in voice communication for the first time, and this has happened within a short time (Wyche & Oslo, 2018). A World Bank policy research working paper indicates that in the late 1990s, less than 3% of Kenyan households owned a fixed-line telephone, and fewer than 1 in 1,000 adults had a mobile-phone (Demombynes & Thegeya, 2012). Over the past few years, Kenya has had unprecedented growth in the mobile-phone sector. According to the Communications Authority of Kenya (CA) sector quarterly report, mobile-phone subscribers stand at a total subscriber base of 52 million, up from 49 million in 2018 (CA, 2019). This subscription represents a penetration rate of over 103% of the total population (Statista, 2021). With these impressive numbers, there is still a gender gap in access and ownership of a mobile-phone. Globally women are 8% less likely than men to own a mobile-phone (GSMA, 2019). In Kenya, 91% of the men own a mobile-phone, while 86% of the women own a mobile-phone. As with many technologies, men are the first to own mobile-phones (Hahn & Kibora, 2008). There also exist differences between urban-rural areas regarding mobile-phone ownership, with a large Kenyan population, 70%, living in rural areas.

As smartphone adoption continues to rise rapidly in Sub-Saharan Africa, it is estimated that by 2025 smartphone connections will double to reach 678 million, an adoption rate of 65% (GSMA, 2020). As a result of cheaper devices becoming available, up to 50% of total connections were made in 2020. Smartphone use is also on the rise in Kenya, and its use continues to accelerate, making Kenya rank among the leading adopters (Deloitte, 2019). A report by Pew Research Center (2019) shows that 41% of adults in Kenya owned a smartphone, while 45% owned a basic or feature phone, and the remainder 14% did not own a mobile phone. Smartphone sales in Kenya accounted for 97% of all phones sold, driven by the growing demand for 4G connections, while 3% are feature phones, with 68% of sales in Nairobi (Techweez, 2018). Away from urban areas, most mobile-phone devices in Kenya only support the 2G network; hence, they are basic/feature phones. Also discussed earlier, Telco in Kenya continues to invest in these older technologies alongside the latest networks as they move at the pace of the consumers.

Despite all these strides, women, the poor, the less educated, and the aged are less likely to own new technologies such as smartphones or get online than the other groups. According to Google's Consumer Barometer (2016) report, rich people are twice as likely to own a smartphone than poor people, while educated adults are thrice more likely than less-educated individuals. Rural areas, which account for 70% of Kenya's population, are still far removed from smartphone ownership and internet connections found in the urban towns (Wyche & Oslo, 2018)

2.2.4 Mobile-phone users in Kenya

According to Meso et al. (2005), most mobile-phone users in sub-Saharan Africa (SSA), and by extension Kenya, have owned a phone for the first time, using the device more for communication, and socializing as opposed to performing economic activities and business. They further say this characterizes the early stages of adopting a mobile-phone, and most of these users are transitioning through the initial stages of technology-use behavior. On the other hand, Ngugi et al. (2010) posit that the mobile-phone adoption in Kenya was quick, particularly in P2P mobile money transfer applications, with little effort to promote the technology. The rapid adoption of P2P mobile money in Kenya in a short period contrasts with how new technologies have been adopted in other sectors of the economy in Kenya. For example, sectors of the economy such as farming, banking, manufacturing, and transport, among others, have primarily been known for low adoption of new technologies. Even concerted efforts to introduce advanced technologies to those sectors have still resulted in low uptake (Suri, 2006).

As has been mentioned, in Kenya, close to 70% of the country's population live in rural areas, and these are the majority of mobile-phone and mobile money users (Ngugi et al., 2010). This large segment of the population has been unbanked for a long time and without access to information communications technology (ICT) for decades (Meso et al., 2005). Only 19% of the Kenyan population had access to banking services during the introduction of mobile money in Kenya in 2007 (FSD-Kenya, 2009). For a long time, this population has been trapped below the 1% teledensity threshold, which is considered essential for the economic development of a country (Mbarika, Jensen, & Meso, 2002). With a per capita annual income of about US\$890 (IFC, 2010), the majority of this population in the rural area relied on remittances from those working in the urban areas (Ngugi et al., 2010).

Though most of Kenya's population has embraced the mobile-phone, the type of use is not as sophisticated and robust as in developed economies. Mobile-phones are primarily used for voice communication, and sending text messages and commerce through the mobile-phone is mainly conducted using SMS and USSD (Meso et al., 2005). Until recently, "dumb" and feature phones dominated the Kenyan market. According to Google's Consumer Barometer (2016), slightly more than half of the mobile phones in Kenya were basic or feature phones, with the Pew Research Center (2019) report showing that 45% of adults owned a basic or feature phone. With most of the phones in Kenya still being basic-feature phones, this limits the kind of activities that can be performed using these phones, including browsing the internet for information, playing games, and completing business or financial transactions.

2.2.5 Mobile-phone Use Trends in Kenya

Mobile-phone use in Kenya has primarily been for voice and text messaging since its introduction in the late 1990s. Available data from the Communication Authority of Kenya shows that local calls made in the year 2018/2019 increased by 24.4% up from the 2017/2019 financial year, with 61 billion minutes used (CA, 2020). The report further shows that short messaging services (SMS) declined by 1.1% in 2018/2019, with 66 billion messages sent over the same period.

The year 2007 saw the introduction of mobile money by a mobile network operator (MNO), Safaricom Ltd. The SMS-based money transfer application M-Pesa was a solution developed initially for micro-lending programs and first piloted in Nairobi. Since then, there has been a proliferation of mobile money services by other MNOs in Kenya, introducing similar services on their networks. Today, MNOs providing P2P mobile financial services in Kenya are Safaricom Ltd (M-Pesa), Airtel Network Ltd (Airtel money), MobiKash, Mobile Pay Ltd. (Tangaza), Finserve Ltd. (Equitel Money), and Telkom Kenya Ltd (T-Kash) with M-Pesa commanding more than 98.9% of the market share (CA, 2020). Table 3 below shows each network operator's total number of mobile money subscribers.

Table 3: Total Number of Mobile Money Subscribers

Operator	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19
Safaricom PLC (Mpesa)	21,338,328	17,120,278	22,624,298	23,946,174	26,900,772
Telkom Kenya Limited (T-Kash)	192,531	193,831	194,445	63,023	76,061
Airtel Networks limited (Airtel Money)	3,119,812	4,853,869	1,530,645	3,619,415	3,681,194
MobiKash	1,714,170	1,772,466	1,772,466	-	-
Mobile Pay Limited (Tangaza)	503,556	503,556	87,786	90,442	94,416
Finserve Limited (Equitel Money)	873,643	1,860,647	1,864,838	1,959,009	1,882,440
Total Number of Subscribers	27,742,040	26,304,647	28,074,478	29,678,063	32,634,883

Source: Communications Authority of Kenya

The popularity of P2P mobile money in Kenya, coupled with the convenience of the service, has continued growth, with over 2.7 million subscribers recorded within the first 14 months of its introduction (IFC, 2010). The P2P mobile financial subscribers currently stand at over 32.5 million (CA, 2020). These statistics show that the service serves nearly 62.5% of Kenya's population. P2P mobile money transfer service in Kenya M-Pesa is one of the most successful in developing the world (The Economist, 2013).

2.2.6 Summary of Kenya's socio-economic, political, and technological trends

In some respects, progressive developments have occurred over the past two decades in the Kenyan ICT sector. Key developments in the sector include increased convergence of broadcasting and telecommunications and increased bandwidth via access through the undersea cables. Landing the undersea cables brought high consumer expectations, and mobile network operators (MNOs) have since become the largest ISPs providing mobile-phone access to users. As a result, the mobile-phone has experienced unprecedented growth over the past few years, and so have internet subscriptions. In addition, mobile technology is widely used to provide money transfer services and m-payments that have spread widely across the country. However, there still exist differences between urban-rural areas regarding mobile-phone ownership and use, as a large population of the Kenyan people, 70%, live in the rural area.

The following section examines m-commerce, m-commerce empirical studies, and the knowledge gap.

2.3 M-commerce

Pousttchi et al. (2015) describe m-commerce as “m-commerce assumes mobility of devices and their users, the possible mobility of services between devices, and the use of related location or mobility information to enable, support, or conduct transactions” (Pg. 1). According to Tiwari and Buse (2007), the need for user mobility in banking, entertainment, travel, and marketing, among many other sectors, is the key driving force of m-commerce. They further posit that m-commerce is a spin-off between IT and telecommunication technologies, forming information and communication technology (ICT).

The following section looks at the history of m-commerce and m-commerce research over time. Further, the section looks at where the field has come from and what is happening in practice and research. After that, the study addresses the difference between e-commerce and m-commerce and defines the two terms and the working definition this study will adopt. Further, the study discusses m-commerce activities users engage with.

2.3.1 M-commerce Practice History

Available literature identifies three trajectory periods of m-commerce practice; the mobile portal era, the mobile internet era, and the mobile applications era (Kourouthanassis & Giaglis, 2012). The first era, the mobile portal, started in 1997. Mobile network operators (MNOs) promoted m-commerce services to their customers through mobile portals in this era. However, this first m-commerce launch was deemed a failure (Tiwari & Buse, 2007). A few Asian countries, such as Japan which promoted the I-Mode application, and China which had explosive growth in SMS, were an exception (Liang & Wei, 2004). The second era, the mobile internet, began in the 21st century due to technological advancements like high-speed mobile broadband supported by 3G networks and the emergence of smartphones. The initial promoters of mobile portals started exiting, thus allowing traditional e-commerce providers to tailor their websites to the capabilities of mobile devices regarding design, interaction, and functionality (Kourouthanassis & Giaglis, 2012). After that, the mobile application era, termed the third era of m-commerce, started around 2007. During this time, there was a proliferation of smartphones, micro-browsers, and the first m-commerce offerings, such as location-based offerings not originating from e-commerce. Device and platform developers like Apple, Google, and Microsoft popularized third-party

application distribution to their already established large audiences. Figure 1 below shows the three eras of m-commerce and the major milestones.

Figure 1: The Three Eras of M-commerce

Era	Major milestones
Era 1: M-portals (beginning in ca. 1997)	1997: WAP (Wireless Application Protocol) Forum is formed 1999 (February): NTT DoCoMo's i-mode launch in Japan 1999 (December): Vodafone Live! launch in Japan (as J-Sky)
Era 2: M-internet (beginning in ca. 2000)	2000: Ericsson R380 Smartphone (the first device to use the Symbian OS) 2000: Opera Mobile (the first commercial microbrowser) 2001: Mobile Explorer 3.0
Era 3: M-apps (beginning in ca. 2007)	2007: Apple iPhone launch (June) 2008: Apple's App Store launch (July) 2008: Google's Android market launch (October)

Source: Kourouthanassis & Giaglis (2012)

2.3.2 M-commerce Research Over Time

Researchers have undertaken extensive m-commerce literature reviews with several seminal works that have taken a holistic view of analyzing m-commerce research (Tarasewich et al., 2002; Fouskas et al., 2005; Ngai & Gunasekaran, 2007; Kourouthanassis & Giaglis, 2012; Pousttchi et al., 2015). Besides these studies providing a holistic m-commerce research analysis, over time, several researchers have also looked at specific m-commerce research topics in their work, e.g., Chan and Chong (2013), Wei et al. (2009), Khalifa and Shen (2008).

In the early days of m-commerce research, i.e., during the first era of m-commerce and the beginning of the second era, many terms such as mobile e-commerce (Tarasewich et al., 2002; Siau & Lim, 2001) and wireless e-commerce (Tarasewich & Warkentin, 2001; Kannan et al., 2001) were used to refer to commerce activities conducted using mobile technology and wireless devices (m-commerce). At the time, e-commerce was profoundly impacting the world business arena. Compared to traditional e-commerce, m-commerce brought exciting business opportunities due to mobile technology's unique characteristics — mobility and expansive reach. In addition, mobile technologies were better suited for bandwidth-limited applications; hence, their usage differed from traditional PCs.

Two perspectives came to the fore during the early days of mobile technology (Waters, 2000). One view saw mobile devices as something new and different. Proponents of this perspective saw mobile devices as having a unique interaction style with limitations such as small screen sizes, lack of color, and keyboard, among others. The other view saw mobile devices as another point of access to the internet – providing another method to interact with websites but with different formats and constraints. These views formed the foundation of the first wave of m-commerce research. During this time, m-commerce research more broadly focused on the various characteristics of technology and applications (Chan & Chong, 2013). For example, among many other studies, Muller-Veerse (1999) extensively presented a review of m-commerce applications and technology, while a detailed examination of m-commerce applications was conducted by Varshney et al. (2000). These studies, among many, discussed what existed at the time or what researchers and practitioners planned to do.

The second wave of m-commerce studies shows that some scholars did start to address m-commerce issues (Kannan et al., 2001; Varshney & Jain, 2000; Siau et al., 2001; Tarasewich et al., 2002). However, these studies did not provide a comprehensive classification or list of m-commerce issues to guide future research work. In their seminal work, Tarasewich et al. (2002) suggested a multidimensional approach to examining m-commerce issues, i.e., from three distinct dimensions - technical, organizational, and geographic. Each of these dimensions characterized a continuum for evaluating m-commerce issues. After identifying several issues related to mobile e-commerce, this was grouped into design, implementation, and management (Tarasewich et al., 2002). The first dimension – the technical dimension – dealt with m-commerce research issues that ranged from non-technical to those that are a little technical to those that are more or less entirely technical. The second dimension — the organizational dimension continuum — considerations were to segment m-commerce issues according to how they impacted an organization. Here, researchers looked at issues at hand and recognized whether they primarily affected an individual, a team or a workgroup, a department, an entire organization or multiple organizations (within or across industries), or an environment outside the organization (Tarasewich et al., 2002). Lastly, the third dimension was to examine m-commerce issues along with the range of geographic importance. What to look out for was the immediate impact of an m-commerce issue – from a local, regional, national, or global perspective (Tarasewich et al., 2002). The above seminal work gave a possible classification to

form a basis for investigating possible m-commerce issues. This classification of m-commerce issues is not exhaustive, and Tarasewich et al. (2002) recommended augmenting them with other perspectives. Fouskas et al. (2005) recognized the contribution of Tarasewich et al. (2002) in classifying m-commerce issues at the time. However, they saw some limitations in prioritizing m-commerce research work at the time. They argued that it was not grounded in empirical research and analysis and was primarily based on the authors' viewpoints.

Notwithstanding immense business potential, numerous uncertainties and challenges characterize m-commerce, creating a high-risk environment. Fouskas et al. (2005) argued that a multidisciplinary approach was required to understand m-commerce issues because of the several aspects of m-commerce. Inspired by scholars Yang et al. (2004), Fraunholz and Unnithan (2004), and Kumar (2004), who had taken a multidisciplinary approach to m-commerce issues in their studies, Fouskas et al. (2005) put forward an m-commerce research roadmap. The roadmap defined and classified priorities for future m-commerce research and its related issues systematically, holistically, and from global and national perspectives. The production of the m-commerce research roadmap involved capturing global research constituents' opinions who contributed their expertise to m-commerce research issues. They also helped in prioritizing the m-commerce research agenda in the roadmap. The m-commerce research roadmap developed by Fouskas et al. (2005) classified m-commerce research into four dimensions: technology, services, value, and enablers. During this classification, research challenges were prioritized in the short, medium, and long term in each of the domain areas identified. The roadmap not only defined research topics to be investigated and the time frames but also emphasized the necessity of engaging in multidisciplinary research.

Ngai and Gunasekaran (2007) noted a significant increase in m-commerce research activities after 2000. They identified and reviewed m-commerce articles published between 2000 and 2003. The review presented a detailed analysis of m-commerce research during the period and brought the state-of-art m-commerce research to the fore. The research review identified 149 m-commerce articles in 73 journals and categorized them into five dimensions: m-commerce theory and research; wireless-network infrastructure; mobile middleware; wireless-user infrastructure; and mobile cases and applications. The above classification formed the Ngai and Gunasekaran (2007) m-commerce research framework. This framework was anchored on Mennecke and Strader's (2003) work and Varshney and Vetter's (2002). Varshney and Vetter (2002) had earlier

proposed a four-level framework that identified middleware, m-commerce applications, wireless-user infrastructure, and network infrastructure. Mennecke and Straders (2003) indicated that wireless user infrastructure, middleware, and network infrastructure are the technology pillars of m-commerce that provide a foundation for m-commerce applications development. This is besides research activities and matching theories that will guide the development of m-commerce. The outcome of the articles reviewed by Ngai and Gunasekaran (2007) showed that many articles were related to m-commerce behavioral issues, economics, business models, strategy, usage, and context, among others. They took cognizance that during the early development stages of technology, such as m-commerce technology, infrastructure, and technology studies take center stage. They expected more research to shift towards user experiences and marketing as the m-commerce field matured. Also popular at the time of carrying out their study were several researchers widely discussing m-commerce applications that support financial activities, m-payments, and m-banking (Ngai & Gunasekaran, 2007). Notably missing was research showing the relationship between cultural differences in adopting m-commerce.

Using Ngai and Gunasekaran's (2007) framework, Kourouthanassis and Giaglis (2012) analyzed 41 journals and looked at 1031 m-commerce articles between 2000 and 2011. They concluded that m-commerce research was growing and maturing, given the increased number of publications. From the analysis, 41% of the articles studied were on user behavior and adoption. Two strong themes emerged from the articles reviewed — adoption and diffusion of mobile applications and business models and strategy formulation. Kourouthanassis and Giaglis' (2012) analysis showed that after the 2006/2007 period, adoption and behavioral studies were the preferred research areas for m-commerce theorists. Notably, m-commerce theorists during the early days of m-commerce research focused on m-commerce strategy and economics, but adoption and behavioral studies started outnumbering the earlier areas.

Pousttchi et al.'s (2015) seminal work also reviewed more than a decade of m-commerce research, and they further carried out a Delphi study among leading researchers in the m-commerce field. First, the motivation behind this work was to build a bridge that linked past m-commerce research to future work. Second, they argued that prior work did not consider where it was presented and why. Their work looked at research published in major IS journals and conference proceedings, limiting their search to top m-commerce article outlets between 2002

and 2013. The year 2002 is seen as the take-off period for m-commerce research. This search identified 12 journals and four conferences. Out of this research, a total of 1,613 articles were analyzed. Geographically, Europe had the most publications with 882 papers, followed by Asia with 462, North America with 418 articles, and Africa with only 11 papers. The most active country in m-commerce research was the US, followed by Germany, China, and Finland, in that order.

Pousttchi et al. (2015) examined the topics, research strategies, and tactics researchers pursued in their work by sampling the papers using the morphology method. In general, three themes — business to consumer (B2C) applications and service, empirical theory development, and mobile markets — dominated what researchers pursued from 2002 to 2013, accounting for 69% of the contributions in terms of topic development and popularity. As topics matured, quantitative research gained traction as a research strategy. Qualitative research started at a higher level in 2002 — typically used when a studied phenomenon is new — picked up between 2006 and 2009 and started to taper off, giving way to more quantitative research strategies. Large-scale surveys are usually common as a topic matures. This was the most common research tactic, followed by case studies and in-depth surveys. Presenting a broad landscape of what the m-commerce community had achieved and its influence on IS discipline, Pousttchi et al. (2015) concluded that several extensive literature reviews were already available. M-commerce research was no longer a new topic.

A three-round Delphi study was conducted among leading m-commerce scholars (Pousttchi et al., 2015). This was to determine the changes that had taken place in the m-commerce field and its future direction. According to Pousttchi et al. (2015), the scholars' views on past research were that six research areas were of significant importance: mobile internet, user behavior, development of mobile markets, mobile HCI, B2C services and applications, and theory development. The scholars' views aligned more broadly with the literature review results. In terms of the current m-commerce research at the time, scholars saw a shift where research areas that formerly had dominated were losing their relevance or undergoing major changes. A case in point is that mobile internet as a research area was no longer relevant but so much more so was ten years earlier. Development of mobile networks remained in the top rank, and topics such as analysis of large data sets and networks were new and emerging. While topics such as user

behavior ranked as the top two during the study period 2002-2013, scholars during the Delphi study ranked it among the least relevant topic; however, it still had strong advocates.

Scholars' view of the future of m-commerce research in Pousttchi et al.'s (2015) Delphi study further indicated that m-commerce literature lacked a robust theoretical foundation. This view also aligned with Pousttchi et al.'s (2015) literature review findings. Therefore, theory development was ranked as the most important agenda for future m-commerce research. Thus, this calls for developing new theories that are particularly mobile-specific and applying existing theories to the mobile context. Scholars viewed mobile market development as another major future research area, among the eight top important topics out of the sixteen identified. Other future topics were analyzing large datasets and networks, social network architecture, mobile social networks, wearable computing and quantified-self, ubiquitous ecosystems, mobile enterprise, data privacy, security, and legal issues. Pousttchi et al. (2015) also agreed that the leading m-commerce scholars' views constituted a fair assessment of the past and present research and a future research direction. Theory development was, however, limited in all the papers analyzed in the top IS journals. As indicated in Pousttchi et al. (2015) work, there was a scarcity of theory development articles in most top-level IS journals, especially from 2011 to 2013. Theory development for strategic issues was almost non-existent in most of the published work during the period under study. Also notable is that much of the work presented over the period was based on theories and methodologies such as the technology acceptance model, diffusion models, and motivation to use, previously developed by IS scholars to study earlier technology waves. Also, according to Pousttchi et al. (2015), m-commerce research work at the time did not speak to unique aspects of mobile systems. Therefore, little of it found its way to top-level IS journals that demand original theoretical contributions.

Therefore, it is apparent that early research on m-commerce was undertaken to understand the issues researchers and practitioners were grappling with at the time. Later research tried to understand what the m-commerce community had achieved, bringing the field's state-of-art to the fore. It also was to find out the influence of m-commerce on the IS discipline and the number of specific m-commerce topics so far researched. While some research areas have become obsolete, many new research areas are emerging. However, researchers see m-commerce research has been on the growth path, and the field is maturing despite all this.

2.3.3 M-commerce Definition

Various definitions of m-commerce have been suggested in the IS literature. In this section, definitions used over time by various scholars are discussed, compared, and contrasted, and an attempt is made to distinguish between them. Issues emanating from the various definitions by authors are highlighted. The definition of m-commerce adopted for this study is then clarified. The term e-commerce is distinguished from m-commerce, and various terms that have been used synonymously with m-commerce are also highlighted.

Academia and industry have conceptualized m-commerce and e-commerce in different ways. Researchers have also indicated that there lacks an apparent boundary between e-commerce and m-commerce (Okazaki, 2005). With the blurring boundaries between m-commerce and e-commerce, distortion, misunderstanding, and misrepresentation of terms and concepts for researchers are likely to occur. Thus, this calls for clarity and shared consensus among those working in the field (Omonedo & Bocij, 2014). It will, therefore, be important to first distinguish between the concepts in this study.

As indicated, “e-commerce” and “m-commerce” have been defined differently by different researchers. Hence, there exist divergent views in distinguishing between the two concepts, and distinguishing between them in literature has been problematic—Tiwari and Buse (2007) highlight two schools of thought when differentiating between the terms. One school of thought argues that m-commerce is an extension of e-commerce. Several researchers who subscribe to this school of thought see a close relationship between them (Varshney & Vetter, 2002a; Wakefield & Whitten, 2006; Tiwari and Buse, 2007; Coursaris et al., 2012). These scholars see a close resemblance between these concepts from the perspective of similarity in technology used and how business activities are conducted. From the technological perspective, e-commerce and m-commerce facilitate commerce through IT mediation. While e-commerce uses PCs and wired networks, m-commerce uses mobile devices and wireless technology to conduct commerce over the internet.

Varshney and Vetter (2002a), Yang (2005), and Wakefield and Whitten (2006) are some of the scholars who see this similarity through the lens of technology. According to Varshney and Vetter (2002a), m-commerce is an extension of e-commerce conducted over wireless and mobile networks. The terms wireless e-commerce and mobile e-commerce have been used

synonymously in literature by m-commerce scholars when referring to m-commerce. The other similarity between e-commerce and m-commerce lies in how business is conducted – the interaction of entities involved in e-commerce and m-commerce. Both conduct B2B, B2C, B2B, and C2C. Researchers have cited, among other things, that these similarities present substantial business opportunities connecting businesses and customers (Vishwanath et al., 2003). Chong (2013), for example, saw the profound impact e-commerce had on the business community and so envisioned m-commerce also to have an even larger if not more impact on both business and industry. Yang (2005) indicated that following successful e-commerce, m-commerce would offer mainstream applications for business. Researchers who hold this view encompass the early m-commerce researchers and those of today.

On the other hand, other researchers have argued that the two concepts are distinctly different and are independent business fields (Feng et al., 2006; Wei et al., 2009; Featherman et al., 2010). They observe that there exists a distinct difference between the two concepts. Thus, m-commerce offers an alternative value proposition to e-commerce in many ways. First, its usage pattern differs from that of traditional desktop computers. Secondly, because of constraints due to terminal devices, the m-commerce interaction style is unique. Lastly, the anywhere, anytime, and everywhere capability; business activities can be performed in real-time, which was not previously possible. Therefore, M-commerce usage patterns, interaction styles, and value chains are pretty different compared to e-commerce. Omonedo and Bocij (2014) presented three unique characteristics that delineate m-commerce from e-commerce – mobility, immediacy, and ubiquity.

Defining the term e-commerce before defining m-commerce is important so that we clearly distinguish between the concept of m-commerce and the predecessor e-commerce. Academia and practice have presented varied definitions of e-commerce over time, emphasizing different aspects of e-commerce – the commercial transaction aspects of e-commerce or the electronic part in performing e-commerce transactions (Bahn & Fischer, 2003, IBM, 2001). Defining e-commerce this way is looking at e-commerce from a narrow or restrictive perspective. This means that the whole transaction is either completed electronically or must have a commercial transaction aspect or both. For example, most of the definitions presented generally have focused on the commercial transaction aspect of e-commerce, i.e., the selling and buying of services and goods over the internet. For example, IBM (2001) defines e-commerce as “*a part of the business*

that includes the act of selling products and services on the internet.” The emphasis of the above definition is the monetary aspect of the transaction, and it does not capture the non-commercial activities of e-commerce. Again, this defines e-commerce from a narrow perspective. A similar definition posits that “Transactions are regarded as Electronic Commerce when the offer for sale as well as the purchase or the actual availing of a product or service is carried out electronically, with the help of a computer-mediated network, against monetary payment.” (Bahn & Fischer, 2003 Pg. 1). The emphasis is still on the monetary aspect of the transaction, while at the same time, it requires that the entire transaction be completed electronically. This definition is restrictive, not considering that parts of the transactions may not necessarily be completed electronically.

Defining e-commerce and emphasizing the commercial aspects of transactions is problematic (Omonedo & Bocij, 2014). The non-commercial aspects of conducting transactions such as marketing, human resource management, request and sharing of information, advertising, customer relationship management, and procurement are important activities in performing business. These activities may not offer direct commercial benefits of monetary value but provide other indirect value, such as reducing operational costs or increasing sales. However, most of the definitions by different authors found in the literature do not consider the non-commercial activities related to e-commerce and focus on the online buying and selling of goods and services (Tiwari & Buse, 2007; Omonedo & Bocij, 2014). For example, Zwass (1996) defined e-commerce as sharing business information, maintaining business relationships, and conducting business transactions using telecommunications networks.

Online buying and selling of goods and services should not be the only emphasis when defining e-commerce. A more broad, inclusive definition is then required. For example, Omonedo and Bocij (2014) defined it more broadly while also considering other events such as pulling and pushing of information, which can eventually culminate in increasing sales or providing operational cost savings, defined the concept of e-commerce as:

“the conduct of activities that includes the transfer, exchange or sharing of information, goods, and services over a network, particularly the internet, with the purpose of getting some form of direct or indirect commercial benefit.” (Pg. 3383).

The method used to place or receive an order should not determine whether a transaction is an e-commerce, the mode of payment, or the delivery channel (OECD, 2002). However, Tiwari and Buse (2007) argue that the primary criteria for e-commerce should at least allow for partial electronic forms of transactions with monetary payment made or otherwise for goods and services.

Before defining m-commerce, it is noteworthy that researchers treat several terms as substantially equivalent. Mobile e-commerce (Tarasewich et al., 2002; Siau & Lim, 2001), wireless e-commerce (Tarasewich & Warkentin, 2001; Kannan et al., 2001) and m-business (Balasubramanian et al., 2002; Lehner & Watson, 2001) are some of the terms used synonymously to refer to m-commerce. Thus, researchers have also put forth varied definitions when studying m-commerce. It is essential to have a conceptual agreement that promotes a shared understanding of a concept, encouraging clarity of communication and convergence in thinking. Available literature presents varied definitions for m-commerce (Omonedo & Bocij, 2014). Other scholars have also used m-commerce and m-business interchangeably. Without a clear conceptualization of m-commerce, it will be challenging to construct a systematic body of knowledge for the field.

M-business and m-commerce provide the mobile aspects of performing transactions over the internet (Tiwari & Buse, 2007). However, definitions of m-commerce take m-commerce to be an integral subset of m-business (Duan & Song, 2010; Ning & Xiu-Kun, 2010; Tiwari & Buse, 2007). Thus, according to Omonedo and Bocij (2010), m-commerce involves a lower level of activities when compared to m-business. Therefore, despite sharing specific characteristics such as mobility, they are conceptually different, each with unique characteristics.

Available literature presents varied definitions for m-commerce (Omonedo & Bocij, 2014). They give different meanings for m-commerce and provide blurred boundaries that hinder theorizing and m-commerce research issues. Balasubramanian et al. (2002) advised on the need for a standard meaning for m-commerce to reduce unclear boundaries that could hinder theorizing and research in m-commerce issues and application. They also pointed out the importance of separating the underlying technologies of m-commerce from concepts, particularly when concepts are embedded deeply in the technology. Underlying technologies change, and they do so very often, whereas concepts remain the same for a while. Omonedo and Bocij (2014) further

pointed out the need to separate explicit technologies and platforms in definitions. When specific technologies and platforms are embedded into a definition, then such a definition is not dynamic. The definition becomes problematic when it cannot account for new technological developments as they emerge. For these reasons, the conceptualization of m-commerce should be independent of any underlying technological platform.

To define m-commerce, researchers have done so from a narrow and broad perspective. For example, Barnes (2002) defines m-commerce as *“any transaction with monetary value conducted - either directly or indirectly – over a wireless telecommunications network.”* Another definition by Clarke (2001) referred to m-commerce as *“any transaction with monetary value that is conducted via a mobile network (Pg. 41).”* While these definitions agree that monetary value is involved when conducting m-commerce transactions, researchers see this as defining m-commerce from a narrow perspective (Chong, Chan, & Ooi, 2012; Paavilainen, 2002). According to Omonedo and Bocij (2014), not including activities that do not have direct commercial value is a drawback in defining m-commerce.

Chong et al. (2012) agree that m-commerce should not be restricted to monetary value and wireless technologies. If that is the case, other business activities like marketing and after-sales services afforded through m-commerce, would be disregarded (Tiwari & Buse, 2007). M-commerce is then defined more broadly by Tiwari and Buse (2007) as:

“any transaction involving the transfer of ownership or rights to use goods or services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of mobile devices.” (Pg. 33)

The above definition considers all the aspects of today’s m-commerce activities that other definitions had not captured when defining m-commerce previously. According to Omonedo and Bocij (2014), this definition is broader but excludes activities with no direct commercial value – marketing, pre-purchase, etc. Leung and Antypas (2001) defined m-commerce as:

“...content delivery (notification and reporting) and transactions (purchasing and data entry) on mobile devices such as WAP-enabled devices, Personal Digital Assistants (PDA), etc.” (Pg. 12)

Two important building blocks make the above definition - content delivery and transaction. According to Omonedo and Bocij (2014), the above definition considers direct and indirect monetary value transactions, such as reporting and notification. These transactions may not necessarily be of value monetarily but can increase consumer trust, loyalty and sales. However, Omonedo and Bocij (2014) point out that Leung and Antypas' (2001) definition of m-commerce included specific technologies and platforms. In addition, technologies over time change, and new and emerging ones, such as Near Field Communications (NFC), come to the fore. Therefore, Leung and Antypas' (2001) definition may not be dynamic and account for newer technologies.

Building upon Leung and Antypas' (2001) definition and considering the shortcoming of their definition, Omonedo and Bocij (2014) defined m-commerce as:

“The conduct of activities that involves content delivery (notification and reporting) and transactions (purchasing, transfers, data entry) on mobile devices capable of gaining access to a network, particularly the internet, which provides a direct or indirect commercial benefit.” (Pg. 3384)

The above definition addresses deficiencies identified in other definitions given by various scholars. First, the definition does not consider the monetary value of transactions. Activities such as searching for information and comparing prices will eventually facilitate the actual purchase of goods and services. These activities are not monetary but are important and eventually translate into a sale. Second, the above definition does not also consider particular technologies or platforms. Technologies and platforms supporting commerce can change over time, with new ones emerging and older ones becoming obsolete. Therefore, Omonedo and Bocij (2014) define m-commerce more broadly without restricting the monetary values of activities and specific technologies and platforms to support these activities.

Consequently, a broader definition of m-commerce by Omonedo and Bocij (2014) is adopted by this study. Thus, this research regards m-commerce as any transaction initiated or completed to purchase goods and services using a mobile device. M-commerce will include the use of mobile devices to search for information, evaluate product and service alternatives, and perform actual purchases and the use of mobile devices to provide post-purchase feedback on goods and services acquired. Most M-commerce transactions in developing economies are done through

basic mobile-phones, which are not connected to the internet. Therefore, SMS and USSD sessions can initiate and complete m-commerce transactions. It is also noteworthy to say that Omonedo and Bocij's (2014) definition captures the context under which this study is carried out – a developing economy. The definition encompasses transactions that may not necessarily use sophisticated technologies such as those found in developed countries, such as smartphones, tablets, and the internet. However, there is a good proportion of basic/feature mobile-phones in the market and performing m-commerce activities using SMS and USSD.

However, m-commerce has progressed beyond content delivery and transactions. Other areas of its focus now extend to access to real-time information (such as weather reports, sports scores, maps) and entertainment (download of music and movies, games, instant messaging) and higher-level transactions such as financial applications, banking, micropayments, etc. (Pandey & Chawla, 2019). Therefore, a more dynamic definition of m-commerce is still required to capture the new developments. Table 4 below shows some of the different m-commerce definitions researchers have used over time.

Table 4: Definitions of M-commerce

<i>Researcher</i>	<i>Year</i>	<i>Definition</i>
Duffey	1997	The delivery of electronic commerce capabilities directly into the consumer's hand, anywhere, via wireless technology (Kevin, 1997)
Benmoussa	2000	M-commerce is 'the use of hand-held mobile devices to communicate, inform, transact and use text and data via connection to public or private networks' (Benmoussa, 2000)
Lyytinen	2001	M-commerce involves the use of mobile computing devices in carrying out different types of economic transactions or enabling them to take place over space and time (Lyytinen, 2001)
Kontinen	2001	The m stands for both mobile and multi-model, and he identified key features of M-commerce as wireless and anywhere and moving (Kontinen, 2001)
Carlsson and Walden	2002	M-commerce is in many cases of common wisdom understood as electronic commerce products and services offered on mobile platforms (Carlsson and Walden, 2002)
Sadeh	2003	M-commerce is 'the emerging set of application and services that people can access from internet-enabled mobile devices' (Sadeh, 2003)
Yang	2005	M-commerce is defined as any direct or indirect transaction conducted and facilitated through a wireless telecommunication network (Yang, 2005)
Tiwari, Buse and Herstatt	2006	M-commerce is 'any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobiles access to computer-mediated networks with the help of mobile devices' (Tiwari, Buse and Herstatt, 2006)
Sharma and Gutierrez	2010	M-commerce is the subset of e-commerce, which includes all e-commerce transactions, carried out using a mobile device (Sharma and Gutierrez, 2010)

Source: Adapted from Chou et al. 2018

2.3.4 M-commerce Applications

Mobile applications, as indicated earlier, herald the third m-commerce era, which started around 2007 with the proliferation of the smartphone and micro browsers covering a broad range of functions. According to Liang and Wei (2004), mobility and reachability constitute the two main attributes of m-commerce applications.

Researchers have made much effort to classify m-commerce applications and services with many classifications in several studies (Senn, 2000, Balasubramanian et al., 2002; Xu & Gutiérrez, 2006; Liang & Wei, 2004; Pandey & Chawla, 2019). Scholars have used different approaches to

classify m-commerce applications. M-commerce application classification has been done from different viewpoints; i.e., the functionality the application offers (Andreou et al., 2002), m-commerce business models based on mobile characteristics (Varshney & Vetter, 2001), m-commerce attributes (Xu & Gutiérrez, 2006), and m-commerce application value proposition (Yuan & Zhang, 2003). Because of the large number of m-commerce applications and services, researchers have argued that the classification will help designers, developers, and researchers strategize effectively to implement m-commerce applications (Varshney & Vetter, 2001). Other researchers, such as Balasubramanian et al. (2002), have also argued that categorizing m-commerce applications and services is helpful. It can be used to organize the thinking about m-commerce. It further can facilitate a systematic understanding of various m-commerce based business strategies and their variations across applications and serve managers as a tool to systematically audit their operations for m-commerce opportunities. Scholars, therefore, agree on the importance of classifying m-commerce applications and services. However, there is inconsistency in the basis of the classification. Therefore, there is no overarching agreed-upon framework to classify m-commerce applications.

Researchers have, therefore, proposed several m-commerce application frameworks in various studies (Pagani, 2004; Mahatanankoon et al., 2005; Ngai & Gunasekaran, 2007; Chan & Chong, 2013). For example, Senn (2000) is among the early m-commerce scholars who classified m-commerce applications. He classified m-commerce applications into three categories: transaction management, digital content delivery, and telemetry services. Other early m-commerce scholars, such as Balasubramanian et al. (2002), in their framework, categorized m-commerce applications along the three dimensions, that is, the extent to which the application is location-sensitive, time-critical, and controlled by the information receiver (or the user) or by the provider (or the network). In Ngai and Ganasekaran's (2007) framework, the categorization included location-based services, mobile entertainment services, mobile advertising, mobile financial applications, and product locating and searching.

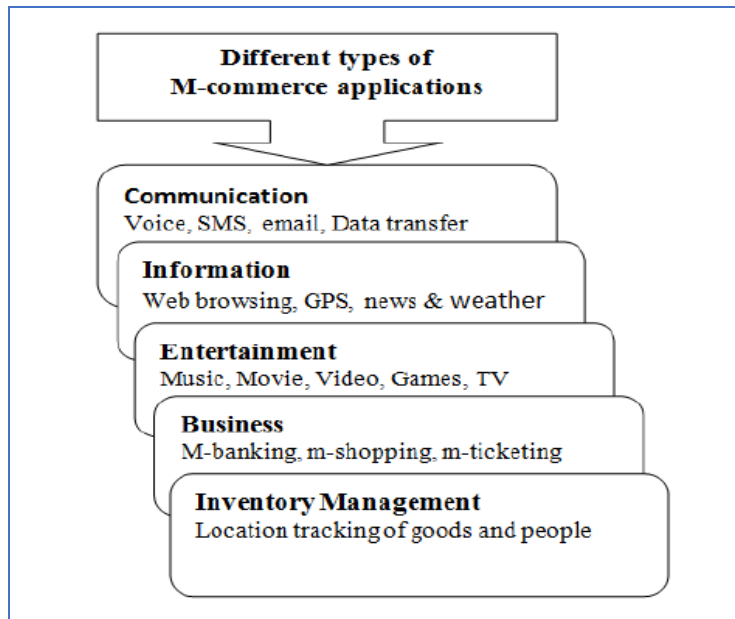
Early m-commerce application classification frameworks were conceptual studies. Later studies empirically validated m-commerce application frameworks. Some of the studies with empirically validated m-commerce application frameworks are those by Mahatanankoon et al. (2005) and Shin and Choi (2006). Mahatanankoon et al. (2005), using confirmatory factor analysis, empirically validated the Ngai and Ganasekaran (2005) m-commerce application classification

and categorized m-commerce application users engage with as content delivery, transactions, location-based services, and entertainment. Mahatanankoon et al. (2005) further posited that content delivery uses m-commerce platforms to perform activities such as surfing to search for information, while m-commerce transaction activities deal with financial exchange activities between consumers and businesses. Location-based services deal with, for instance, obtaining items such as tickets and personalized advertisements. Location-based activities also allow shops to offer customers recommendations while at the location. Finally, M-commerce entertainment activities include using mobile devices to listen to music, watch videos, and play games online. This means that the detailed literature review by Ngai and Gunasekaran (2005) and Mahatanankoon et al. (2005) are consistent.

Also, classifying M-commerce applications based on m-commerce application attributes that support similar services, Shin et al., (2006) explored the consumers' preference for m-commerce applications and came up with four classifications; information, entertainment, financial, and management support. Notable is the overlap in these empirical studies categorizing m-commerce applications; content delivery – information, transactions – financial and entertainment. However, Shin et al. (2006), in their m-commerce application categorization, included management support. Shih and Shim (2002) had earlier indicated that most mobile applications engendered themselves into two categories: consumer-based and business-based m-commerce applications. Consumer-based applications allow people to conduct activities that are part of their lifestyle, such as receiving stock prices, finding restaurants, driving directions, shopping online, etc. Business-based applications are used in organizations to improve productivity in a company by facilitating business transactions. These include mobile inventory tracking systems, mobile offices, wireless data centers, etc. (Shih & Shim, 2002). Mahatanankoon et al.'s (2005) m-commerce applications classification support consumer-based applications, while Shih & Shim's (2002) m-commerce classification includes management support, a business-based activity.

Figure 2 below shows types of m-commerce applications and related activities.

Figure 2: M-commerce Applications



Source: Adapted from Rahman (2013)

The above classification of m-commerce applications offers insight into the activities of m-commerce users (Chan & Chong, 2013). Furthermore, m-commerce exceptional characteristics, for instance, being continuously accessible and location-based in addition to convenience, identifiability, and customization, also present an opportunity for application developers and providers to offer unique applications for m-commerce users (Mahatanankoon et al., 2005). This study is concerned with consumer-based m-commerce applications, content delivery, transactions, location-based services, and entertainment as m-commerce applications users engage with during their day-to-day activities through mobile-phones, and this forms the basis of this study. The following section looks at the m-commerce adoption, m-commerce adoption empirical studies, and their deficiencies in relation to the present study.

2.4 M-commerce Adoption

Several factors have been studied to understand m-commerce adoption phenomena. However, researchers have not only argued that factors influencing the adoption of m-commerce are varied, but they are likewise complicated (Hsu & Yeh, 2018). For example, adopting m-commerce may differ across countries driven by the differences in facilitating conditions like telecommunications infrastructure, culture, the diversity of m-commerce services on offer, and the marketing strategies used by organizations (Williams et al., 2015; Shankar and

Balasubramanian, 2009; Dai and Palvi, 2009). Similarly, Crabbe et al. (2009) and Yaseen and Zayed (2010) point out that research on m-commerce suggests that the adoption of m-commerce in developing economies is dependent on a different set of variables as compared to the developed nations and, therefore, considering context when conducting adoption studies is important.

Dholakia et al. (2004) have argued that due to the nature of different types of m-commerce activities an individual can engage with, they produce different sets of factors that influence their adoption. For example, examining individuals' adoption of internet content accessed through mobile may involve different influences than mobile parking services accessed through simple SMS to exchange required information to complete a parking transaction. Therefore, due to a wide diversity of services under the umbrella of m-commerce and their infinite use contexts, the possibilities of combining existing factors and adding new ones by respective studies are broad. Dholakia et al. (2004) further point out that m-commerce services adoption and usage have been highly variable between countries. As a result, M-commerce adoption and development vary significantly across different countries and have been particularly low in developing economies (Zhang et al., 2012; Pandey & Chawla, 2019).

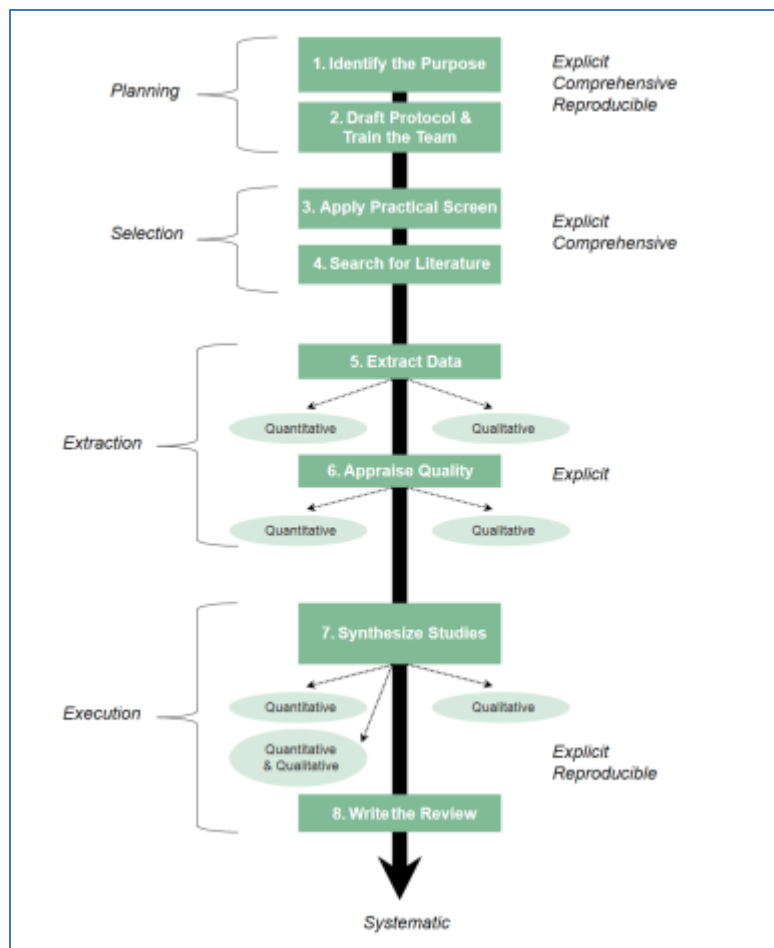
The section below reviews m-commerce adoption empirical studies in developing economies and identifies the knowledge gap this study will address.

2.4.1 M-commerce Adoption in Developing Economies - Empirical Studies and Knowledge Gap

Specifically, this section looks at m-commerce adoption by individuals in developing economies. A systematic literature review (SLR) methodology was used to structure this study's literature review. Okoli and Schabram (2010) emphasize the importance of a detailed methodological approach in any literature review, whether “systematic review” or “conventional/traditional reviews.” The SLR approach summarizes what has been written and found out about research topics. The approach also provides a transparent research process to study patterns and evidence from prior research studies. Therefore, all research procedures must be made explicit before the actual literature review is conducted to make the process objective and replicable. Okoli and Schabram (2010) and Okoli (2015) proposed guidelines to conduct a systematic literature review. The guidelines provide eight significant steps for systematic literature, which they

recommend to be very valuable for any literature review. These include: the purpose of the literature review, protocol, and training, searching for the literature, practical screen, quality appraisal, data extraction, synthesis of studies, and writing the review. The steps are classified into planning, selection, extraction, and execution see Figure 3 below. However, Templier and Paré (2018) give six (6) generic steps: formulating the problem, searching the literature, screening for inclusion, assessing the quality of studies, extracting data, analyzing data, and synthesizing findings.

Figure 3: A Systematic Guide to Literature Review Development



Source: Adapted from Okoli (2015)

2.4.1.1 Literature Review Development

Templier and Paré's (2018) generic six (6) step approach was used to structure the study's review as outlined next.

Step 1: Problem Formulation

This step is concerned with identifying the purpose of the literature review and defines the review's central topic to be carried out (Templier & Paré, 2018). This study posed the following research question: "*How do the roles mobile-phone users play influence m-commerce activities adoption in a developing economy context?*" to examine the role played by mobile-phone users and how they influence the adoption of m-commerce activities in developing economies

Step 2: Literature Search

In this step, the researcher develops a transparent search strategy that aligns with the research question(s) posed for the study (Templier & Paré, 2018). The step also specifies which sources will be searched and where; it further specifies terms that will be used to search the sources, in which period, content (topics or variables), and publication language (Levac, Colquhoun, & O'Brien, 2010:3).

In this study, a literature search was conducted using Scopus and Web of Science because of their credibility. Besides, Google Scholar was searched because of its accessibility and potential to uncover research from developing economy research published in avenues not listed in the more established databases. While it may be argued that such articles are of lesser quality, the obstacles in accessing top journals are many for researchers in developing economies (Collyer, 2018). This study was interested in research done, even where the quality could be improved; therefore, the study included grey literature. Study literature sources were in the English language, from developing economies published within the last ten years. The *intitle* operators were used to ensure that article titles retrieved included the words following the "**AND**" and "**OR**" Boolean operators. This was used to ensure that key terms existed in the title of the articles. All the 52 countries in Africa were searched for literature that addressed m-commerce adoption by individuals. The following is a sample of the search strings used to search for literature:

Intitle str: "M-commerce Adoption" OR "Adoption of M-commerce" AND ("Kenya" OR "Uganda" OR "Tanzania" OR "Rwanda," OR "South Africa" OR "Nigeria" OR "Ghana" etc.)

Intitle str: "M-commerce Adoption" OR "Adoption of M-commerce" AND "Africa."

After that, literature addressing m-commerce adoption was searched for studies in developing countries/economies using the following search strings:

Intitle str: "M-commerce Adoption" OR "Adoption of M-commerce" AND ("developing country" OR "developing countries" OR "developing economy" OR "developing economies)

Literature retrieved was from multiple data sources (e.g., journal articles, conference proceedings, theses, and grey literature). Based on these search strings, a total of 107 articles were identified. However, Booth et al. (2016) observe a possibility of electronic searching missing relevant published work due to defining concepts and indexing challenges. Therefore, further steps must be taken to identify other studies that might have been missed through the search strings. As a result, an additional reference list of papers was identified, and 12 other papers were identified. Thus, the total number of articles that were identified for screening was 119.

Step 3: Screening for Inclusion & Exclusion

Screening identifies studies to be considered appropriate for further analysis. The process specifies how primary studies are screened or selected (Templier & Paré, 2018). Specific methods used to select articles are outlined, and the inclusion and exclusion criteria. The following inclusion and exclusion criteria were employed:

This study included studies done between 2010 to 2020. The search started with studies done in Kenya and East African countries - Uganda, Tanzania, Rwanda, Burundi, Somalia, Ethiopia, and Sudan. The search further progressed to search for literature in Southern Africa – South Africa and the other African countries – Nigeria, Ghana, Cameroon, Egypt, etc. Further, the search was extended to include all other developing economies. Also, articles included were those that studied m-commerce adoption by individuals. The study excluded studies that addressed small

and medium enterprises (SMEs), small, medium, and micro enterprises (SMMEs), organizations, firms, informal sector, and country. It also excludes any other study which did not include m-commerce adoption or adoption of m-commerce in its title. Also excluded were theses and practitioner studies and reports. With the inclusion and exclusion criteria applied on the spreadsheet, 95 articles were filtered. Two articles were removed as there was a double entry. Fourteen papers were further reviewed because their titles did not include M-commerce adoption and adoption of m-commerce adoption - 81 were retained.

Further looking at the study titles and abstracts, 19 more articles were removed. These articles did not address m-commerce adoption by individuals. Also, the article title had m-commerce adoption while it addressed other applications such as m-commerce advertisement, m-banking, etc., giving 62 articles.

A further 21 articles were excluded from the study for various reasons leaving 41 articles for review. For example, Safeena et al. (2011), titled "Customer's Adoption of Mobile-Commerce: A Study on Emerging Economy." After going through the article, the study addressed m-banking adoption. Chong (2013) was a post-adoption study on continued intention to use m-commerce. The Fawzy & Salam (2015) paper titled "M-Commerce adoption in Egypt: An extension to the theory of reasoned action" looked at m-advertising. Wamuyu (2018), titled "Exploring the Use of Global Positioning System (GPS) for Identifying Customer Location in M-Commerce Adoption in Developing Countries," was focused on addressing GPS for identifying customer location.

Step 4: Quality Assessment

Researchers evaluate all potentially eligible articles collected for quality (Okoli (2015)). They examine searched articles more closely to evaluate their quality. Not all studies are of equal quality and, therefore, the need for researchers to rate studies based on how they meet various quality standards set out. Fink (2005) stresses that for researchers to assess papers quantitatively, there is a need to judge studies in depth for data-collection methodology, interventions, analysis, results, and conclusions. However, they caution researchers to apply leniency to methodological standards for inclusion of studies in a literature review by not prematurely excluding work in areas that are not yet well understood, particularly research in newer and emerging areas. For example, Tamale et al. (2020) sought to address mobile-commerce usage challenges among university students in Uganda. The study set out to establish the m-commerce services utilized

by university students and ascertain the challenges students face using m-commerce. The study methodology was not fully developed. The study used descriptive statistics to answer the research question, concluding that students did not lack the requisite skills to carry out mobile commerce. This study was removed from the articles to be considered for the data extraction stage.

Step 5: Data Extraction

A clear data extraction strategy must be used to answer the study's research questions (Templier & Paré, 2018). Several proposals have been given for data extraction techniques, such as Webster and Watson's (2002) –concept-centric approach. The approach encourages researchers to adopt a concept matrix to extract critical information from selected studies. For example, Webster and Watson (2002) argue that without an organizing framework to extract relevant concepts from included studies, there are high chances of overlooking, misclassifying, or misinterpreting critical information when synthesizing literature. Appendix C shows the matrix table that was used to extract concepts from the 41 articles identified.

Step 6: Data Analysis and Interpretation

This step uses appropriate techniques to make sense of extracted data (Cooper & Hedges, 2009). The main aim is to tell what the literature has said. This is achieved through synthesis, aggregating, critically assessing the literature, and then identifying a research gap as presented next (Schryen et al., 2020).

From the systematic literature review (SLR) method used to identify articles for this study's literature review, several researchers have studied the m-commerce adoption phenomena in developing economies. Researchers have used different lenses, with most prior research considering m-commerce as a subset of IT applications and applying behavioral models to investigate its adoption (Khalifa et al., 2012). The majority of the studies conducted in the search list for this study have used technology adoption theories as base theories, TAM (Pipitwanichakarn & Wongtada, 2020; Cedeno, 2019; Hsu & Yeh, 2018; Cullen & Kabanda, 2018), DOI (Chinedu & Huisman, 2019; Joubert & Van Belle, 2013), TPB (Mishra, 2014, Khalifa et al. 2012), UTAUT (Chou et al. 2018; Njenga & Salih, 2018; Sim et al., 2018; Pandey & Chawla, 2019). Other researchers have combined two or more theories, e.g., TAM/UTAUT (Dongmo et al., 2020), TAM/DOI/TPB (Ntsafack et al., 2018; Gitau & Nzuki, 2014; Sadi &

Noordin, 2011). While researchers have used these adoption theories, they have been used as base theories (Sim et al., 2018; Chou et al., 2018; Hsu & Yen, 2018; Yadav et al., 2016). Some studies have extended them to accommodate other factors that may not be accounted for due to unique characteristics of m-commerce that are different from those of traditional technologies. Most studies that addressed individual adoption of m-commerce in developing economies literature scoped in this study used TAM as the base theory, followed by UTAUT and then DOI. In contrast, other studies have combined these theories.

With m-commerce adoption by individuals in developing economies, scholars have also argued that adoption theories may not have considered context-specific issues related to technology adoption (Sim et al., 2018; Pipitwanichakarn & Wongtada, 2018; Cullen & Kabanda, 2018; Pandey & Chawla, 2019). Facilitating conditions like telecommunications infrastructure, culture, the diversity of m-commerce services on offer, and the marketing strategies utilized by the organizations differ across countries, and they drive the differences. Pipitwanichakarn and Wongtada (2018) have said that in developed economies where technology is highly progressed - Europe, the US, Canada, etc. - certain factors may be more important than others compared to developing economies. For example, in developed economies, perceived usefulness is assumed as more important than perceived ease-of-use. In contrast, in developing economies, perceived ease-of-use is more relevant to adopting a technology that is not as widely adopted (Pipitwanichakarn & Wongtada, 2018). Several researchers have concluded that traditional adoption models may not be sufficient to comprehensively explain the factors that affect individuals' intentions to adopt or not adopt m-commerce services (Rajabion, 2015). Researchers have, therefore, extended adoption theories by borrowing factors that may not have been captured in these theories to accommodate the unique characteristics of m-commerce. As well as capture the context under which the phenomenon is studied, considering factors applicable to the m-commerce situation studied (Pipitwanichakarn & Wongtada, 2018).

Further, the systematic literature review conducted in this study revealed that researchers have tested over 50 different factors to understand m-commerce adoption by individuals in over 17 developing countries. The most analyzed factors identified from these studies (see Table 5) are Perceived Ease-of-use and Perceived Usefulness. This is in line given that TAM was the most used theory to study the m-commerce adoption phenomenon in the selected studies, followed by

Trust, Social Influence, Cost, Risk, Performance Expectancy, Effort Expectancy, Subjective Norm, and Facilitating Conditions. Studies conducted from 2010 to 2020 in developing countries have reported conflicting findings on the impact of some of these factors on m-commerce adoption by individuals. On the one end, the impact of these factors ranges from significant to insignificant on the other end. For example, on the one end, several studies have indicated a significant impact of Perceived Usefulness on m-commerce adoption (Hsu & Yeh, 2018; Rahman, 2016; Sadi & Nordin, 2011). Conversely, some studies have shown an insignificant impact (Islam et al., 2010).

Similarly, conflicting results have also been reported regarding Perceived Ease-of-use. Some studies show a significant impact on Perceived Usefulness (Hsu & Yeh, 2018; Sadi & Nordin, 2011), and others have an insignificant impact (Pipitwanichakarn & Wongtada, 2020; Rahman, 2016). Factors influencing m-commerce activities adoption have not been comprehensively understood, with prior studies showing conflicting results regarding m-commerce adoption across countries (Verkijika, 2018). Therefore, extant literature reveals several factors that impact individuals' successful adoption of M-commerce in developing economies.

Two schools of thought emerged from the SLR search for this study, from the perspective of how researchers have addressed m-commerce adoption. One school of thought has looked at m-commerce adoption from a general perspective. This school of thought constitutes most studies conducted to date to investigate m-commerce adoption by individuals in developing economies, as shown in Appendix C. Researchers have investigated whether m-commerce has been adopted or has not been adopted. On the other hand, the other school of thought has argued that m-commerce adoption is more than just adopting m-commerce or not adopting m-commerce (Cullen & Kabanda, 2018; Pandey & Chawla, 2019; Chong, 2013; Chan & Chong, 2013). M-commerce involves a spectrum of activities a user is involved in, and indicating whether m-commerce is adopted or not adopted does not reflect the entire range. M-commerce researchers have classified m-commerce activities a user can be involved in for content delivery, transaction, location-based services, emergency purposes, and entertainment (Cullen & Kabanda, 2018; Pandey & Chawla, 2019; Chong, 2013; Chan & Chong, 2013). Content delivery involves using a mobile device to search for information, send/receive emails, read/receive news, and search the internet for content. Transactions involve using mobile devices for payment transactions,

banking, and money transfer between consumers and businesses. Location-based involves using mobile devices to receive shopping-related offers and personalized adverts or notifications from marketers. Lastly, entertainment involves using mobile devices to play games and listen to music. These classifications have been empirically validated through first and second-order confirmatory factor analysis (Chong, 2013). The m-commerce activities have different attributes, and users engage in them for different reasons as they move from one role to another. While most studies have looked at m-commerce adoption by individuals from a general perspective, a dearth of studies has mainly looked at m-commerce activities, from the spectrum of content delivery, transactions, location-based services, and entertainment.

Traditionally information systems (IS) researchers have considered technology users as “technology-user” who interact with the technology. Initially, a technology-user used technology for work purposes, and the organization provided for this. Today, individuals purchase, adopt, and use technology and continue to pay to use it or pay through the use of the technology. According to Catchapero & Park (2010), individuals who choose to adopt m-commerce are not merely adopting a technology by itself but rather a new instrument of commerce. Thus, adoption decisions relating to m-commerce are expected to differ from those of traditional technology adoption. As explained in this study, researchers have then argued that traditional adoption theories and models may not be sufficient when investigating m-commerce adoption behavior (Roy & Moorthi, 2016, Islam et al., 2011; Hou et al., 2011; Turban et al., 2002).

Further researchers have also argued that unique characteristics of m-commerce, such as mobility, broad reach, ubiquity, convenience, and localization, drive users to prefer m-commerce (Turban et al., 2002). Literature scoped for this study show that one study looked at ubiquity (Roy & Moorthi, 2016). Another study looked at convenience as a factor influencing m-commerce adoption (Islam et al., 2011). However, no study was found to have looked at how mobility, broad reach, or localization influence m-commerce adoption.

Likewise, researchers have posited that insufficiency in explaining adoption through traditional adoption theories is due to a lack of considering the influence of social network factors on the critical adoption behavior (Hou et al., 2011; Alnajjar & Ramayah, 2013). For example, Alnajjar and Ramayah (2013) argue that Arab countries are collectivist societies, and social norms can play a significant role in adopting or rejecting a new technology. In their study, Huo et al. (2011)

verified the impact of social networks on the adoption of m-commerce by farmers in China. They argued that adoption decisions are often influenced by the other members of their social network, and social network effects significantly impact individual adoption of m-commerce. Some researchers have included in their studies factors such as social influence (Dongomo, 2020; Tarhini et al., 2019; Ding et al., 2019), social norm (Cedano, 2019; Alnajjar et al., 2013), and subjective norm (Chinedu & Hisman, 2019; Ali et al., 2019; Al-Dwairi et al. 2018). According to Alhinai et al. (2007), accounting for these factors and recommendations is important. M-commerce adoption research has shown that individuals' adoption reflections, influences from one's social network, and behaviors observed within a network influence the adoption decision (Catchapero & Park, 2010).

Recent studies have suggested a need to consider individuals adopting m-commerce as consumers (Chi, 2018; Rajabion, 2015, Huo et al., 2011; Alhinai et al., 2007; Pedersen et al., 2002). M-commerce studies that have considered individuals as consumers have looked at how they perceive the cost of using a technology (Cedeno, 2019; Yadav et al., 2016; Dwivedi et al., 2014) or the price value of using a technology (Tarhini, 2019; Verkijika, 2018). Other studies that have considered individuals as consumers have included factors such as the impulsiveness of an individual (Ng, 2016) and how individuals consider brand image (Chi, 2018). The literature search through the SLR method employed in this study indicates limited research in developing economies that have considered individuals' as consumers who adopt m-commerce.

Therefore, literature recognizes m-commerce users as individuals playing three roles – a technology-user, consumer, and social network-member. M-commerce users are different from traditional technology users - two other roles discussed above, network-member and consumer - separate them from the adopters of traditional technologies (Catchapero & Park, 2010). Triangulating the three roles is essential, as m-commerce researchers have pointed out (Rajabion, 2015, Huo et al., 2011; Catchapero & Park, 2010; Alhinai et al., 2007; Pedersen et al., 2002), and needs to be considered in analyzing an individual's m-commerce adoption behavior. This will allow information systems researchers to get a complete perspective of the adoption of m-commerce by investigating the three roles individuals adopting m-commerce play. We all perform various roles depending on the situation, ranging from age, occupational, and family roles, and we all move from one role and take on another role many times over time. Individuals

play numerous roles and move between roles. According to Ashforth et al. (2002), individuals disengage from one role (role exit) and engage in another (role entry) in daily lives. For example, one can be playing the role of a mother changing diapers in the morning and later at work as a manager delegating duties to subordinates. Individuals have no self but adopt different roles depending on the situation. For example, one can act the role of a father or mother to the children in one situation while a son or daughter to parents, or a brother or sister to siblings.

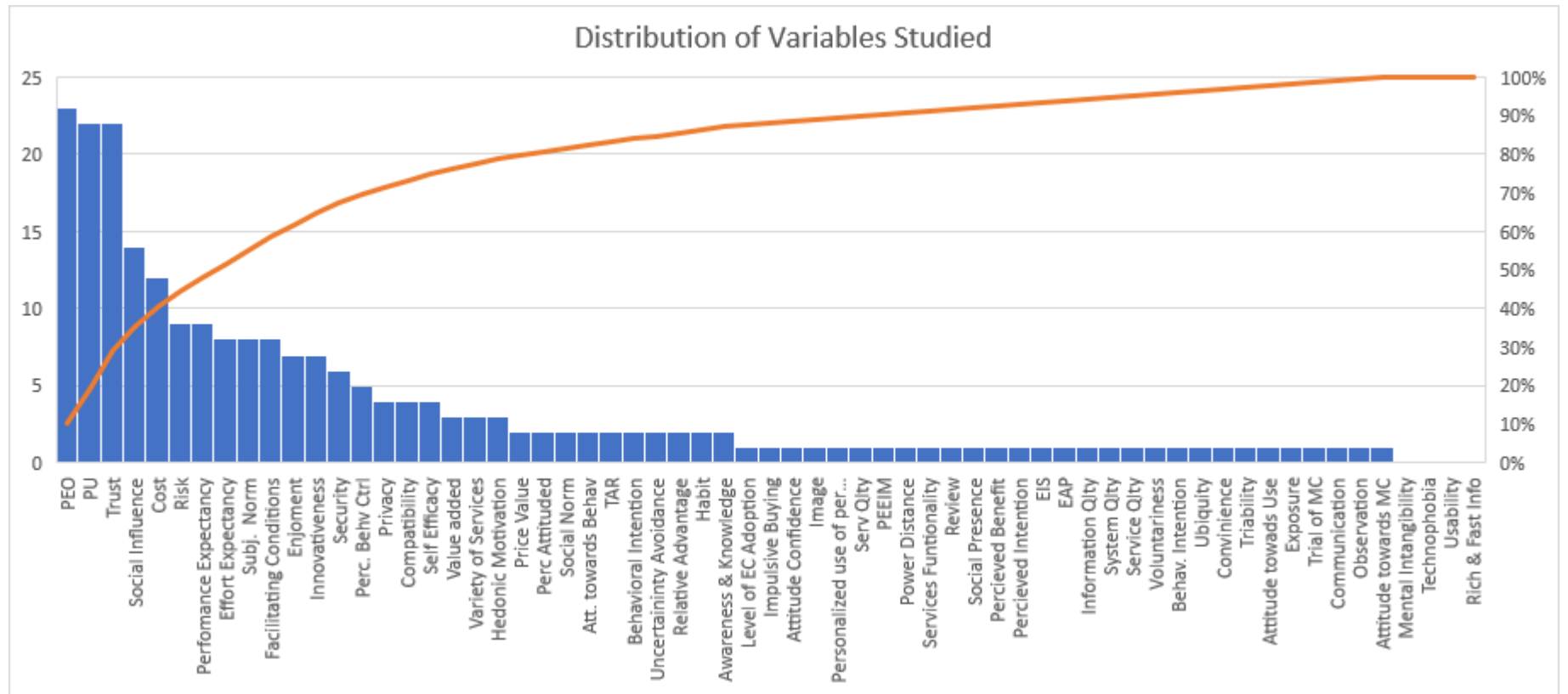
Further, one can act as a friend to peers, a lover to a spouse, or a teacher at work. While playing different roles, individuals exhibit behaviors to match the roles played at the time. Therefore, over time one moves from one set of expected positional behaviors to another in a social system. Mobile technology users are actors in a social system taking on and moving from one role to another. A mobile technology user will be manipulating technology, performing transactions, and interacting with social network members, thus moving from one role to another. According to Allen and Vliert (1984), human behavior is determined less by the characteristics of a person but largely by the part one plays, and behavior is not random and meaningless but tends to be patterned. Therefore, the roles an individual plays influence behavior in some ways.

Appendix C - I summarizes m-commerce adoption studies that were scoped through the SLR method this study employed. Most studies have addressed m-commerce from a general perspective as to whether m-commerce is adopted or not. However, few studies have addressed the full spectrum of m-commerce activities: content delivery, transactions, location-based, and entertainment. Therefore, this study has revealed that there is a knowledge gap when it comes to studies addressing m-commerce activities individuals engage in. The literature review further revealed that while all studies have addressed individuals as a technology-user, few studies have addressed individuals as consumers and social network members. Literature shows a lack of studies in developing economies investigating the three roles: social network-member role; consumer role; and technology-user role explicitly in a single study and, hence, the need for this study to fill the gap.

In conclusion, researchers have argued that, whereas great strides have been made in developed economies and other regions on IT adoption and usage research, in developing economies, such as those in sub-Saharan Africa, research on IT adoption is still nascent (Ntsafack et al., 2018). In particular, m-commerce adoption is well researched in the context of developed economies;

however, there is a dearth of empirical studies that focus on the adoption and acceptance of m-commerce in developing economies (Alfahl et al., 2017; Madan and Yadav, 2018). In line with this, there is also a growing concern among m-commerce researchers that despite impressive numbers of mobile subscribers in developing economies, actual m-commerce activities in many countries remain low (Dogomo et al., 2020; Dakduk et al., 2020; Cullen & Kabanda, 2018; Chong et al., 2011).

Table 5: Distribution of Variables Studied in 41 Articles Derived from Systematic Literature Review in this Study



Source: Author

From the literature scoped, it is clear that a limited number of studies over the recent years have triangulated the three perspectives of a technology-user, consumer, and social network-member in a study (see Appendix C). For example, some studies have examined individuals' beliefs towards technology, such as perceived ease-of-use, perceived usefulness, perceived credibility, among other variables. Others have examined technology characteristics such as compatibility and trialability. However, few studies have integrated consumer behavior of an individual to make payments and make purchase-related decisions or social network-member constructs to seek and give information, help, and or advice in a social network in their studies. Therefore, from the literature review, this study identifies knowledge gaps that this study will seek to investigate: 1) through the notion of roles mobile-phone users play – the consumer role and the social network-member role, and 2) to better understand m-commerce adoption more broadly from the various activities' individuals engage in — content delivery, transactions, and entertainment.

2.5 Chapter Summary

This chapter has looked at the background of mobile-phone technology. It followed by providing an overview of the progress of mobile technology to date and discussed the concept of m-commerce. The second part of the chapter reviewed the literature and discussed technology adoption theories, models, and concepts. Finally, m-commerce adoption empirical studies and the knowledge gap were presented. The following chapter presents the study's conceptual framework.

CHAPTER THREE: CONCEPTUAL FRAMEWORK

3.1 Introduction

This chapter develops this study's research framework. Then, it examines how mobile-phone users' roles influence them to adopt m-commerce activities. The roles mobile-phone users play examined in this study are technology-user, consumer, and social network member. The study further conjectures that the main m-commerce activities likely to be adopted in a developing economy are content delivery, entertainment, and transaction. Therefore, this chapter starts by developing the study's conceptual model and presenting the research hypotheses.

3.2 Development of Conceptual Model

In this section, the study's conceptual model is developed. The section starts by discussing m-commerce activities, followed by describing the roles a mobile-phone user plays, i.e., as a technology-user, a consumer, and a social network-member. Finally, the section discusses theories and models underpinning these roles and how they are measured in this study.

3.2.1 M-commerce Activities

M-commerce has been defined as *“the conduct of activities that includes the transfer, exchange or sharing of information, goods, and services over a network, particularly the internet, with the purpose of getting some form of direct or indirect commercial benefit.”* (Omonedo & Bocij, 2014)

M-commerce, universally, is regarded as a tool essential in enhancing commerce, whether with direct or indirect commercial benefits. It is also commonly accepted that it will play a significant role in productivity, with firms and countries' economies standing to benefit from its widespread adoption. M-commerce delivers most of what the internet can offer, and its unique features: mobility, broad reach, ubiquity, convenience, and localization drive users to prefer m-commerce (Turban et al., 2002). Researchers have argued that when there is widespread adoption of a technology, then that is when its effects are fully realized (Dakduk et al., 2020; Dongmo et al., 2020; Chinedu & Huisman, 2019). Researchers have classified m-commerce applications into content delivery, transaction, location-based services, and entertainment (Chan & Chong, 2013;

Chong et al., 2012; Rahman, 2013; Ngai & Gunasekaran, 2007), and these are the activities individuals engage in.

Content delivery – This is the use of mobile technology devices to perform m-commerce related activities such as surfing to search for information. These classifications have been empirically validated (Chong, 2013).

Transaction – This is performing financial exchange between customers and businesses using mobile technology.

Entertainment – This is the use of mobile devices to listen to music, watch videos, or play games online.

Location-based – This involves using mobile devices for offers/coupons related to shopping and personal advertisements or notifications from marketers – receiving time-sensitive information such as discount tickets and personalized advertisements.

3.2.1.1 Theories underpinning m-commerce adoption

Many models and theories have been formulated and studied about technology adoption and have been used to study m-commerce adoption. These theories identify factors necessary to support different levels of technology adoption. Notable among these theories and models are: the Technology Acceptance Model (TAM) based on the Theory of Reasoned Action (Davis, 1989; Fishbein & Ajzen, 2010); Diffusion of Innovation Theory (Rogers, 1995); Theory of Planned Behavior (Ajzen, 1985); extended TAM2 model that incorporates social factors (Venkatesh, 2000); the Unified Technology Acceptance and Use of Technology theory (UTAUT) (Venkatesh et al., 2003), UTAUT2 (Venkatesh et al. 2012). To accommodate unique m-commerce characteristics, researchers have extended these models to account for them and the study's context. Further, some studies have integrated two or more of these models and theories to understand m-commerce adoption.

TAM leads in the number of studies that have used the theory to study m-commerce adoption, with many others extending the theory to accommodate m-commerce's unique characteristics (Wei et al., 2009; Crabbe et al., 2009; Yang, 2005; Wu & Wang, 2005; Khalifa & Cheng, 2002). While the above studies have been done from a general perspective, literature shows that researchers have used TAM to investigate m-commerce adoption (Chan & Chong, 2013; Cullen & Kabanda, 2018). For example, Chan and Chong (2013) extended TAM by including users'

demographic profiles, motivations, and perceptions of m-commerce security risks. In addition, Cullen and Kabanda (2018) contextualized Chong's (2013) work to explain better how demographics and motivational factors influence m-commerce adoption in South Africa.

UTAUT (Venkatesh et al., 2003) was developed by reviewing eight dominant theories and models mapped and integrated. The theory relates innovation diffusion and adoption to four core constructs: performance expectancy, facilitating conditions, effort expectancy, and social influence. In addition, the user's gender, age, experience, and voluntariness are used to moderate UTAUT's four core constructs. While several studies have used UTAUT to study m-commerce adoption in general, some studies have specifically used UTAUT to study m-commerce activities (Dakduk et al., 2020; Dongmo et al., 2020; Chou et al., 2018; Pandey & Chawla, 2019).

The following section describes the technology, consumer, and social network-member concepts. The section further examines mobile-phone users' roles: technology-user, consumer, and social network-member, and how these roles influence individuals to adopt m-commerce activities.

3.2.2 Technology

This section discusses technology, emerging technologies, technology extension of human capabilities, theories underpinning technology, technology-users, technology-user role, and technology-user role in influencing individual's behavior towards adopting technology. Also, the section discusses how this study will measure the technology-user role.

Technology today makes life more practical than ever before. According to Kaplan (2009), today, our lives' background, context, and medium are structured more than ever around technologies and technological systems. Energy, transport, communication, and production are areas where sophisticated technologies are used today. For example, we use technology to prepare food, also worn as clothing. Reading, writing, purchasing, entertainment, manufacturing, and work, among many other activities, are facilitated through technology. Without technology, some of these tasks may not be easily achieved.

In defining the term technology, Faulkner et al. (2010) point out that this has been problematic. The literature has diverse views on technology and how to conceptualize it. They further say that a wide range of scholarship exists about the nature of technology across different disciplines. Pinch (2010) further indicates that authors writing on technology have unacknowledged

metaphysical presuppositions that are further deepened by sophisticated ethical, political, and cultural considerations generated by the discourse on technology.

The complexities noted above make it difficult to have a general definition of the term technology. For example, Faulkner et al. (2010) posit that the term technology in some aspects is used to refer to material things such as PCs, phones, and cars, among other things. In other instances, it is used to signify the relationship between these material things and the human actions or social arrangements in which they are implicated. The term has also been used to signify scientific activities in biotechnology, IT, and nanotechnology. In other ways, abstract social things such as “money” or less abstract institutions such as police forces and armies are also referred to as technology. According to Lawson (2010), the other debate in defining technology is distinguishing between technical objects and other artifacts. For Lawson (2010), artifacts such as paintings, jewelry, food, toys, and passports, among others, do not enter the technological path as they are not usually considered technical objects. In contrast, objects such as computers and hammers are considered technical objects. According to Faulkner et al. (2010), considerable disagreement exists between researchers regarding what technology is.

Traditionally, according to Brooks et al. (1980), technology has been defined regarding its physical embodiment as novel physical objects created by man to perform certain human functions, which in their opinion, is too narrow a conception of technology. On the other hand, Hannay and McGinn (1980) say that “the basic function of technology is expanding the realm of practical human possibility.” Brooks et al. (1980) further observe that this means a great deal – it is more than just the physical artifact whereby technology ought to be socio-technical instead of just technical. It also needs to encompass other social supporting systems necessary to apply it on a large scale. Lawson (2010) also shares Hannay and McGinn's (1980)'s sentiments of technology extending human possibility. He argues that “a defining aspect of technology is the role it plays in extending human capabilities” (Pg. 207).

3.2.2.1 Emerging Technology

Emerging technologies have been described in many ways. For instance, these could be technologies either in the developmental stages of production, which may not be fully used or probably in the early phases of commercialization. For decades, information and communication technologies have been described as emerging technologies, and more recently added to the list of emerging technologies are biotechnology, genomics, and nanotechnology (Einsiedel, 2009).

These technologies are seen as revolutionary or transformative, with the capability to change some other sectors in which they operate. Emerging technologies can be socially disruptive, and at the same time, they can also bring interconnectedness with new rules and arrangements in society. For example, out of the taken for granted - a car - was described in a 1996 USA Today article as follows:

“drive-through restaurants, drive-by shootings, drive-up banks, gas stations, suburbs, motels, back-seat boogies, body shops, paved roads, parking lots, traffic cops, truck stops, decent factory wages, smooth-talking car dealers, highway deaths, gridlock, pollution, “are-we-there-yet?” family vacations” (USA Today, 1996).

Halaweh (2013) says there is no agreed-upon definition defining the term emerging technology. He posits that technology can be characterized as emerging in a particular context but can be established in another context. For example, radio-frequency identification (RFID) is considered an emerging technology in developing economies, whereas it is not in developed economies Halaweh (2013). As much as the web was invented in the 1990s, newer web applications using second and third-generation applications make it an emerging technology. According to Halaweh (2013), technology is defined as emerging when it causes radical changes to business, industry, or society.

3.2.2.2 Technology Extension of Human Capabilities

Lawson (2010) uses the idea of an extension to bring the difference between the technical from other artifacts. In using the extension presumption, Lawson (2010) envisages the extension of the human organisms that replicate, amplify, and supplement bodily or mental faculties or abilities. The extension idea emphasizes three features:

- Extension of human physical faculties
- Extension of cognitive capabilities
- Extension of human agents' or intentions

For example, in his early work, Kapp (1877), a German technology philosopher, argued that technical objects were a projection of human organs.

“.....the intrinsic relationship that arises between tools and organs . . . is that in the tool the human continually produces itself. Since the organ whose utility and power is to be increased is the controlling factor, the appropriate form of a tool can be derived only from that organ.” (Kapp, 1877, Pg. 44–5).

Drawing from Kapp (1877), a later work of technology conceived by Marshall McLuhan describes technology as some form of extension.

“During the mechanical ages, we had extended our bodies in space. Today, after more than a century of electronic technology, we have extended our central nervous system itself in a global embrace, abolishing time and space as far as our planet is concerned.” (McLuhan, 1964, Pg. 19).

David Rothenberg’s work emphasizes the extension of intentions when describing technology. According to Rothenberg (1993), technology is understood to be a process whereby intentions are realized through the extension of human “aspects” that we understand the working of:

“A part of the human essence is evident in the things which we build, create, and design to make the Earth into our place. Techniques can extend all those human aspects for which we possess a mechanical understanding. Telescopes and microscopes can extend the acuity of our vision because we know something about how our eyes perceive the world optically. But we cannot technically extend our sense of what is right, because we do not understand how this judgment operates” (Rothenberg, 1993).

3.2.2.3 Theories underpinning Technology

Kaplan (2009) identifies neutrality, determinism, autonomy, and social construction as four theories in the philosophy of technology, which according to him, takes a broad perspective on the nature of technology in society. With neutrality, philosophers have interpreted technology as a neutral tool that can be used for right or wrong purposes. With determinism, technology is taken as the driving force for social transformation. With autonomy, technology is taken as autonomous, “a Frankenstein’s monster” beyond our control. Finally, as a social construction, technology is taken as a human-made thing that shapes societies and, in turn, shapes technological development.

3.2.2.4 Technology Users

The term “user” is the active agent in IS use, which is fundamental to IS research and practice and has been conceptualized as “an atomic individual with well-articulated preferences and ability to exercise discretion in IT choice and use, with certain cognitive limits” (Lamb & Kling, 2003 Pg. 198). According to Lamb and Kling (2003), the concept is seen as socially thin, focusing more on the individual and leaving out details that shape IT use. Organizational and complex social structures are made less relevant here by emphasizing the individual, thus limiting the questions researchers can investigate about a technology user. They further posit that institutionalist, social constructionist, and social-technical approaches can inform researchers when re-conceptualizing the term “user” as a social actor. Millerand and Baker (2010) also argue that the concept of a user is underdeveloped in theory.

People using IT and applications use a single application and a variety of them in several roles they play in their day-to-day activities. They also, at the same time, interact with other people in multiple social contexts. Therefore, when the term user is re-conceptualized as a social actor, the metaphor actor enhances the extent of the relationship between people’s social space with technology together with other people, groupings, and institutions (Lamb & Kling, 2003).

Digital convergence and new IT applications have challenged traditional boundaries for users and non-users of information technology. People carrying out tasks previously designed to be done by individuals trained to use IT for work purposes may not recognize that they perform these IT tasks (Iivari et al., 2010). In addition, more and more tasks are being pushed to individuals to accomplish them through technology even without much training (e.g., customers using Internet banking rather than a teller; customers booking airline tickets rather than a travel agent).

3.2.2.5 Technology-user Role

The technology-user role is in line with traditional technology adoption research concepts; hence adoption factors studied relate to technology or service characteristics and their use. Therefore, studies investigating technology user role(s) in most cases use traditional adoption theories and models such as the technology acceptance model (TAM) (Davis, 1989), the theory of planned behavior (TPB) (Ajzen, 1991), and diffusion of innovations (DOI) (Rogers, 1995). Based on these theories and models, adoption researchers have studied individuals’ beliefs and the effects of technology characteristics on the adoption of technology (AlHinai et al., 2007).

3.2.2.6 Technology-user Role in Influencing Individual's Behaviour to Adopt Technology

According to Scheepers et al. (2006), IS researchers have examined how new computing devices can affect users' behavior over time. For example, mobile technologies' physical mobility makes possible usage behavior not associated with other traditional forms of computing. Studies in Kenya by Morawczynski (2007, 2008) show a population taking on a technology-user role for the first time that facilitates the transfer and receiving of money through mobile money technology. Kikulwe et al. (2014) posit that today, rural households in Kenya are likely to receive remittances from friends and family using mobile money technology. The urban family frequently uses mobile money technology to transfer mobile money to relatives in rural areas. This behavior is attributed to the perceived ease of use of mobile-phones, which do not require any form of literacy to operate (Mimbi et al., 2011). On the same breadth, through sending and receiving mobile money, behavior is influenced in many ways (Kiringai et al., 2010). Mobile money is used as a store for future use, thus reducing dependence on unreliable means of transferring money and reducing travel outside one's locality to send or receive money. It is also time-saving for tasks such as paying for utilities such as electricity and water. Thus, mobile technology becomes helpful for an individual and the social system. However, unintended consequences and negative behaviors such as depleting savings due to easy access to e-wallets have been cited (Mwangi & Brown, 2014).

By using mobile-phone, mobile-phone users are technology users. Thus, mobile-phone users play a technology-user role as they engage with the mobile-phone and other information technology devices to communicate and perform other activities using a mobile-phone. This study, therefore, postulates that a mobile-phone user plays a technology-user role and will be influenced towards adopting m-commerce activities as stated in this study. Furthermore, these m-commerce activities, content delivery, entertainment, and transaction are adopted because of their perceived ease of use and usefulness.

3.2.2.7 Measuring Technology-User Role

Perceived ease-of-use (PEOU) and perceived usefulness (PU) are two variables adapted from TAM to measure mobile-phone use by individuals (Davis, 1989). Technology users adopting m-commerce activities incur associated costs related to adopting these m-commerce services; therefore, the cost variable was included in the study to complement the other variables. These involve equipment acquisition, access, and transaction costs (Wu & Wang, 2005). Some

researchers have suggested that cost is a hindrance to adopting new technologies where the user incurs a cost to adopt the technology, such as m-commerce (Luarn & Lin, 2005; T. Wei et al., 2009). Wei et al. (2009) have argued that cost can be a factor that can slow down m-commerce development.

According to Mcknight (2012), trust is crucial because it helps individuals get beyond their uncertainty and fear of risk. Furthermore, it also assists in building an appropriate favorable expectation of performance and other desired benefits (Gefen et al., 2008). Therefore, in this study, trust and cost complement beliefs about technology characteristics (i.e., PEOU and PU) to measure an individual's technology-user role in adopting m-commerce activities.

The section above discussed the concepts of technology, emerging technology, technology extension of human capabilities, and theories underpinning technology. In addition, technology-users, technology-user role, and technology-user role in influencing an individual's behavior towards adopting technology are discussed. Furthermore, the section also discussed how the study would measure the technology-user role. The following section will discuss consumer, consumer behavior, theories underpinning consumer behavior, consumer purchasing decision-making process, consumer purchase decision-making stages, consumer decision-making styles, online consumer decision-making styles, consumer role, consumer role in influencing an individual's behavior towards technology adoption, and how this study will measure the consumer role in influencing individual's behavior to adopt technology

3.2.3 Consumer

The consumer has traditionally been defined by economic goods and services, where the position holds that they are potential purchasers of products of goods and services on offer (Loudon & Bitta, 1993). Over time and more broadly, scholars have considered the monetary exchange as not relevant in describing a consumer (Solomon et al., 2013; Solomon et al., 2006). Consumers are also potential adopters of ideas, services, or even philosophies, typically considered free and not require any monetary exchange to acquire them (Loudon & Bitta, 1993). The activities needed to acquire them are similar to purchasing products and services except for making payments. Therefore, this calls for the need to include this group in the definition of a consumer.

A consumer, according to Loudon and Bitta (1993), is anyone who takes on any of the activities presented in their definition “... *the decision process, and physical activities individuals engage in when evaluating, acquiring, using, or disposing of goods and services*” (Pg. 5). They further

distinguish two types of consumers; those who purchase for individual or household consumption and those involved in purchasing for business firms and institutions. Industrial purchasing is unique because it involves influence from several people participating in the process and could have different buying motives. At the same time, individual buyers are assumed to be making purchases with little or no influence from others. However, some people can occasionally be involved in a purchase decision (Loudon & Bitta, 1993). Solomon et al. (2013) also define a consumer as "*a person who identifies a need or desire, makes a purchase and then disposes of the product during the three stages in the consumption process*" (Pg. 4). These stages are pre-purchase, purchase, and post-purchase.

Loudon and Bitta (1993) further point out that an individual purchasing without the influence of others is the most commonly thought of consumer situation. More than often, though, some people get involved. For example, in a family, the wife can initiate the purchasing, and the husband does the actual purchasing. In other cases, the purchaser acquires products for others to use. The consumer then takes on many roles, such as the initiator, influencer, buyer, and user (Solomon et al., 2013; Loudon & Bitta, 1993). A consumer can also take on one or more of these roles simultaneously. This study concerns itself with an ideal situation for a consumer, an individual who engages in evaluating, acquiring, using, or disposing of goods and services for their consumption.

3.2.3.1 Consumer Behaviour

Consumer behavior studies focus on how individuals spend their time, money, and effort (Schiffman & Kanuk, 2007). The most significant reason for studying consumer behavior is its role in daily lives; how much time individuals spend thinking about products and services - talking to others about them, and listening to and watching advertisements about them (Loudon & Bitta, 1993).

Solomon et al. (2006) define consumer behavior as "*... the study of the process involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires*" (Pg. 6). This definition takes a similar approach to Schiffman and Kanuk (2007). They define consumer behavior as "*the behavior that consumers display in searching for, purchasing, using, evaluating and disposing of products and services that they expect will satisfy their needs*" (Pg. 3). While these definitions are similar in scope, Hoyer and MacInnis (2010) point out that consumer behavior involves more than purchasing of tangible

products. It includes using services, activities, experiences, and ideas such as signing up for yoga classes, donating to charity, making decisions about people, reading books by specific authors, and attending concerts by certain actors. Therefore, broadly looking at consumer behavior, they define consumer behavior as reflecting “*the totality of consumer decisions concerning the acquisition, consumption, and disposition of goods, services, activities, experiences, people, and ideas by (human) decision-making units [over time]*” (Pg. 3).

3.2.3.2 Theories Underpinning Consumer Behavior

The economic theory was the basis of the early theories on consumer behavior. This theory viewed individuals as rational actors who maximized their benefits from the products and services they purchased (Schiffman et al., 2007). The ‘Utility theory’ is the most common model, where the consumer is viewed as a rational decision-maker concerned only with self-interest (Schiffman & Kanuk, 2007; Levin & Milgrom, 2004; Zinkhan & Hirschheim, 1992). This theory views the consumer as a “rational economic man” (Zinkhan & Hirschheim, 1992). However, according to Bray (2008), a broad range of other factors are today considered in contemporary consumer behavior research that influences the consumer and a wide range of consumer activities beyond them. For example, Schiffman and Kanuk (2007) posit that research shows that family, friends, advertisers, role models, mood, situations, and emotions, among others, influence modern-day consumers. Hence, consumers are left with making consumption decisions and face a range of consumption activities and other factors that influence them.

3.2.3.3 Consumer Purchasing Decision-making Process

Consumer expectations of products and services have undergone significant changes, and so has the buying and selling process. These changes and expectations require a thorough understanding of consumer decision-making and forces influencing consumers before responding to their demands. Peppard and Butler (1998) highlight the importance of understanding the consumer before responding to their needs. In addition, understanding consumers help businesses to stay in business by attracting and retaining customers. Therefore, understanding consumers is not an easy task. They can say one thing and do the other or respond to influences at the last minute and change their minds (Kotler, 2012).

Modeling the consumer purchasing decision-making process helps marketers to explain and predict consumer behavior. Schiffman et al. (2007) present different schools of thought that

show consumer decision-making in various ways. They look at consumer decision-making from an economic, passive, emotional, and cognitive perspective.

Economic view: From the world of perfect competition, consumers are faced with numerous alternatives to pick from and are expected to be rational decision-makers. They are expected to behave rationally - rank alternative products and services correctly, and pick the best. However, because of the imperfect world in which consumers operate, they lack the required information to make perfect decisions and cannot maximize their decision-making. They are, therefore, in constant negotiation for better prices and seeking value for their money. In this case, the economic model is seen to be too idealistic and simplistic (Schiffman et al., 2007).

Passive view: Here, the consumer is seen as an irrational and impulsive purchaser submitting to self-serving interests and promotional efforts (Schiffman et al., 2007).

Emotional view: This is where a consumer is associated with profound feelings or emotions, such as joy, hope, sexuality, and fantasy (Schiffman et al., 2007). Purchases are made not because of carefully searching, deliberation, and evaluating alternatives but because of emotions.

Cognitive view: In this view, a consumer is considered a thinking problem solver, actively searching for products and services that fulfill their needs. This view sees a consumer between the economic and passive view without complete knowledge about available product alternatives but seeking information to make good decisions (Schiffman et al., 2007).

3.2.3.4 Consumer Purchase Decision-Making Stages

Peppard et al. (1998) suggest that any purchasing can be placed along a continuum. This continuum extends from one extreme that is routine problem solving, to the furthest extreme, extensive problem-solving. On the one extreme are those purchases a consumer is comfortable and experienced with. These are typically simple and straightforward to perform and, in most cases, done regularly. These are purchases done without much decision involvement. On the other extreme of the continuum are those purchases that require much participation in decision-making.

Harrel and Frazier (1999) point out how important the relationship between purchasing involvement and decision-making is because of the insight it provides into the behavior of consumers. Kotler (2012) identifies five stages of the consumer purchase decision-making process: problem and or need recognition, information searching, assessment of alternatives,

purchase, and post-purchase behavior. According to Kibera and Waruingi (1988), this five-stage purchase decision-making model suggests events that will generally take place in a purchasing decision. However, they posit that there are other comprehensive models for consumer behavior, such as the Nicosia (1966) model, the Engel, Kollat, and Blackwell (1968) model, and the Howard and Sheth (1969) model.

Problem recognition is when a consumer becomes aware of unfulfilled needs or desires. To fulfill the need or desire, a consumer will seek information. Information search is where information is sought to identify and evaluate product alternatives. Experiences stored in memory are called upon and external sources such as friends, relatives, salespeople, and advertisements (Kotler, 2012). Alternative evaluation of products and services is achieved through information obtained, which helps the consumer determine which product satisfies their goals. Purchase activity occurs after carefully evaluating the alternatives, and post-purchase behavior determines satisfaction or dissatisfaction with a buying choice (Harrel & Frazier 1999; Kibera & Waruingi, 1988).

These five stages occur during purchases, whether they are high involvement or low involvement purchases. However, for purchases consumers are comfortable with or experienced with, low involvement purchases, the first three steps are skipped since the purchases are straightforward and generally done regularly. On the other hand, each step takes on greater importance for infrequent purchases with increased purchase involvement (Kotler, 2012; Kibera & Waruingi, 1988).

3.2.3.5 Consumer Decision-Making Styles

Studies on shopping orientation and consumer decision-making styles date back to the 1950s. Researcher Stone (1954) developed the shopping styles typology, the economical shopper, the personalized shopper, the ethical shopper, and the apathetic shopper (Bakewell & Mitchell, 2004). Sproles and Kendall (1986) formulated measurements of consumer-making styles by listing the significant characteristics of consumer decisions cited in the literature. Sproles and Kendall (1986) defined consumer decision-making style as “*a mental orientation characterizing a consumer's approach to making choices*” (Sproles & Kendall, 1986, Pg. 268). Needs recognition, information searching, and pre-purchase evaluation are the first three stages of the purchase decision process described by Blackwell et al. (2008), where each consumer deals with these issues differently when it comes to purchasing. Wang and Hui (2004) also point out that

decision-making styles differ regarding consumer preferences for buying goods and services. For example, impulsive people could skip the evaluation stage of the decision process.

On the other hand, price-conscious people who care for quality go through all the decision-making stages. Therefore, Wanninayake (2014) argues that decision-making styles are crucial for purchasing decisions. Therefore, businesses need to understand their customers better to serve them appropriately.

Models that characterize consumption decision-making styles, as cited by Wanninayake (2014), can be broadly grouped into three: The psychographic/lifestyle approach, which identifies the characteristics related to consumer behavior in purchasing products (Lastovicka, 1982; Wells, 1974); the consumer typology approach, which identifies consumers into several types (Darden & Ashton, 1974; Moschis, 1976); the consumer characteristics approach, which differentiates cognitive dimensions of consumer decision-making (Sproles & Kendal, 1986).

According to Lysonski (1996), the consumer characteristics approach is the dominant of the three, focusing on the mental orientation of consumer decision-making. On the other hand, Sproles and Kendall (1986) conceptualized and classified shoppers' consumer decision-making styles into eight decision-making styles (Kang & Johnson, 2013). This classification focused on the cognitive and affective orientations in consumer decision-making (Sproles, 1985; Sproles & Kendal, 1986). This consumption pattern, named the Consumer Styles Inventory (CSI), a measurement scale of forty items developed to measure consumer decision-making styles (CMDS), is an improvement from the previous one done by Sproles in 1985 (Tanksale et al., 2014; Yang & Wu, 2007).

The eight main styles of consumer decision-making are as follows (Sproles & Kendall, 1986):

1. *Perfectionism*: this consumer is cognizant of high quality, carefully looking for the most excellent quality of products possible. Such consumers have high standards and expectations for consumer goods and are concerned with the utility and quality of products.
2. *Brand*: this consumer is brand-conscious and concerned with acquiring well-known and most expensive brands. The consumer believes that price is a pointer to quality.

3. *Fashion*: this consumer is aware of fashion news. This consumer likes novel and innovative items and gets pleasure from searching for new items.
4. *Pleasure to buy (Hedonism)*: this is a leisure and pleasure-seeking consumer; the consumer enjoys shopping and does it just for enjoyment.
5. *Price*: this consumer is price-conscious and seeks the value of money; such a consumer is concerned with getting lower prices and is apt to be a comparison shopper.
6. *Impulsiveness/carelessness*: this consumer never plans his or her shopping and tends to be a spontaneous buyer. This consumer is not concerned about how much money he or she spends.
7. *Confused-by-over choices*: this consumer feels that there are too many brands and stores in the market and are likely to experience information overload. This type of consumer, therefore, reaches out to friends for help.
8. *Habitual/loyal*: this type of consumer will likely have favorite brands and stores to shop from. This type of consumer purchases at the same stores and is likely to purchase the same brands always.

On the other hand, Sproles & Kendall (1986) argue that CSI does not create a categorization system of decisions since nothing stops a consumer from having several purchasing styles simultaneously. They further posit that researchers have shown that some individuals can have up to two styles driving their purchase decision-making.

3.2.3.6 Online Consumer Decision-Making Styles

With no universally accepted model to understand consumer-shopping styles, most researchers have transitioned to the CSI (Hanzaee & Aghasibieig, 2008; Yang & Wu, 2007). Bauer et al. (2006) point out that the CSI instrument has been the most tested instrument to study decision-making styles from a cross-cultural perspective. The instrument has been applied to several countries such as the US (Wesley et al., 2006), China (Hiu et al., 2001), UK (Bakewell &

Mitchell, 2004), Malaysia (Mokhlis, 2009), Germany (Walsh et al., 2001) and South Africa (Radder et al., 2006). These studies have tried investigating decision-making's generalizability and cross-cultural application in different cross-cultural populations and countries. The instrument has been used in various cultures and countries; parts of the original model are confirmed, with some portions not consistent (Mokhlis, 2009; Dash & Kumar, 2014). For example, a study in South Africa by Potgieter et al. (2013) confirmed most of the CSI factors, with six out of the original eight factors applicable in South Africa, especially to mature adults over 60 years. Notable in this study, impulsiveness, and carelessness were two separate factors, unlike in the original CSI, where the two were a single factor. The study also came up with an additional factor value-conscious in the South African case.

According to Park and Gretzel (2010), different purchasing modes, online and offline purchasing, influence consumer decision-making styles. Of significance to note, most of the studies done have assessed consumer decision-making styles in terms of traditional brick and motor shopping (Hafstrom et al., 1992; Durvasula et al., 1993; Bakewell & Mitchell, 2003; Mitchell & Walsh, 2004; Tai, 2005). However, consumers globally are turning to online purchasing modes such as e-commerce and m-commerce with the rapid diffusion of computers and information technologies throughout businesses and communities (Yang & Wu, 2006; Cowart & Goldsmith, 2007; Park, 2007). Some factors such as website design, product availability, and e-service quality influence consumers' decisions when buying goods and services electronically (Dash & Kumar, 2014). Decision-making styles of online consumers are also another factor that influences online consumers. For example, Yang and Wu (2007) conducted a study to understand online consumer decision-making styles and also whether the difference in gender leads to different online decision-making styles in Taiwan. The study categorized Taiwanese online shoppers into six main decision-making styles from the CSI dropping recreational and price-conscious category in the Sproles and Kendall (1986) work. In this study, they argued that shopping online was not thought of as a leisure activity. For convenience and timeliness, online consumers were willing to pay extra.

3.2.3.7 Consumer Role

The consumer role makes a fundamental distinction between m-commerce adoption studies and adoption studies involving traditional technologies such as PCs (Rajabion, 2015, Huo et al., 2011; Catchapero & Park, 2010; Alhinai et al., 2007; Pedersen et al., 2002). Users' interaction

with technology shapes a more significant part of the adoption determinants that influence an individual's acceptance of traditional technologies. However, m-commerce users pay to use technology and go through a decision-making process when purchasing goods and services using mobile technologies. Such interaction may not be a critical determinant of adopting traditional technologies (AlHinai et al., 2007).

3.2.3.8 Consumer Role in Influencing an Individual's Behaviour towards Technology Adoption

M-commerce and e-commerce are closely associated because computer networks mediate these services (Tiwari & Buse, 2007). E-commerce studies have also tried to tackle the issue of online shoppers as consumers and understand their behavior as technology consumers. Klopping et al. (2004) observed that online shoppers are adopters of technology too, and understanding online shopping behavior is challenging. Many standards have been used to measure shopping. For example, one measuring yardstick is the actual purchase of services and goods, which is seen as taking a narrow scope when assessing online shopping activities. Other measures are self-reporting of time taken online, the frequency of use, or even seeking the information at particular websites. The challenge is that e-commerce consumer behavior is still evolving with technology (Klopping & McKinney, 2004). These same issues also apply to m-commerce. Besides m-commerce having some unique characteristics such as ubiquity, localization, and context-sensitive, it works much like e-commerce, conducting commerce without face-to-face contact.

Budree and Williams (2013), in their research to identify the socioeconomic dissimilarities that led to the initial failure of mobile money in South Africa, categorized two groups of mobile money technology users. These are the youth aged between 18 and 30 years and migrant labor aged between 31 and 40 years, whom they referred to as consumers of the service. One of the reasons they identified that led to the discontinuation of the service by retailers in South Africa was bottlenecks created by the lengthy registration process and long queues, especially during busy periods like the end of the month customer showing frustrating behavior. However, according to the study, perceived ease-of-use behavior was demonstrated by consumers. In addition, a lack of clear communication plans led to a lack of trust in the system.

Activities related to shopping, searching for product information, and performing the actual purchase should be considered to understand online shopping consumer behavior (Klopping & McKinney, 2004). They argue that considering all these activities will give a complete picture of

e-commerce adoption. As AlHinai et al. (2007) point out, understanding the m-commerce user as a consumer is imperative to understanding m-commerce adoption.

In a study by Boadi et al. (2007) on the impact of mobile technologies on rural businesses in Ghana, convenience was identified as a factor impacting m-commerce adoption. They conceptualized convenience as anytime, anywhere, access to information where customer and market are not constrained by time and location when seeking information on products, services, sellers, and buyers. Mobile technologies facilitated communication, where farmers and fishers improved information quality and relationships. The cost of searching for information and timely decision-making, negotiating, accepting contractual conditions, and fulfilling contracts were significantly reduced through mobile technologies. Mobile technologies allowed farmers and fishers to enact consumer roles of rapid searching for information and performing actual purchasing or selling, influencing behavior to timely access to information and improved decision-making.

In their study of poor rural households in Kenya, Kikulwe et al. (2014) show that farmers contribute to a more commercially oriented farming behavior by enacting a consumer role using mobile money technology. Through mobile money technology, significant farm inputs such as fertilizer and pesticides are purchased, labor is hired rapidly, and a good proportion of farm produce gets to the market. In addition, saving through lower mobile money transactions and remittances helps reduce liquidity risks.

3.2.3.9 Measuring the Consumer Role in Influencing Individual's Behaviour to Adopt Technology

This study postulates that mobile-phone users are consumers who make purchasing-related decisions and are, thus, driven by decision-making styles when making purchasing decisions. Eight decision-making style variables from the Consumer Style Inventory (CSI) model were adapted to measure the consumer role in this study. These are perfectionism, brand, fashion, pleasure to buy (hedonism), price, impulsiveness/carelessness, confused-by-over choices, and habitual/loyal. These consumer decision-making styles by Sproles and Kendall (1986) are described as a mental orientation characterizing a consumer's approach to making choices (Kang & Johnson, 2013). Therefore, this study argues that mobile-phone users' decision-making styles will influence the adoption of m-commerce activities - content delivery, entertainment, and transactions.

Researchers have further posited that mobile-phone users go through decision-making when purchasing goods and services using mobile technologies. They make payments to use the technology and perform m-commerce related activities. M-payments today facilitate the making of payments for a wide range of services. To fully make the payment experience effective and efficient to facilitate m-commerce, m-payments, according to Kim et al. (2010), must be both easy to learn and use. Therefore, perceived ease-of-use and perceived usefulness of m-payment complement consumer decision-making styles in this study to measure the consumer role an individual plays in adopting m-commerce activities.

The section above discussed consumer behavior, theories underpinning consumer behavior, consumer purchasing decision-making process, consumer purchase decision-making stages, consumer decision-making styles, online consumer decision-making styles, consumer role, and consumer role in influencing an individual's behavior towards technology adoption. The section further discussed how this study would measure the consumer role in influencing an individual's behavior to adopt the technology.

3.2.4 Social Networks

This section discusses social networks, theories underpinning social networks, social network-member, social network-member role in influencing an individual's behavior to adopt technology, and finally, how this study will measure the social network-member role.

"Everyone could be connected," writes Kadushin (2012), *"if only we knew how to reach out beyond our immediate horizon"* (Pg. 16). Prell (2011) observes that we all have our social networks. As Kadushin (2012) described, a network is a set of relationships with sets of objects and a description of the relationship between the objects or nodes. The most straightforward network comprises two objects or nodes (*dyad*) and one relationship that links them. For example, the two objects or nodes could be people, and the relationship between the two can be simply sharing a room.

According to Kadushin (2012), social networks exist because of actions performed by individuals as they interact with one another. The networks that emerge through these interactions also produce connections that affect the same people. Wellman (1988) posit that peoples' behaviors are best predicted by investigating the web of relationships in which they are embedded instead of their demographic characteristics, attitudes, or what drives them. He further points out that the relationships people form present opportunities and impose constraints on

their behavior. Some of the network's individuals form are friendship networks, work colleague networks, and participating in various activities such as clubs, organizations, and networks (Prell, 2011).

Wasserman and Faust (1994) defined social networks as consisting “*of actors and the relationship or relationships defined on them.*” (Pg. 20). They indicated that a relationship between a pair of actors establishes a tie between those actors, and ties exist between only specific pairs of actors. Prell (2012) further defined social networks as “*a set of relations that apply to a set of actors, as well as any additional information on those actors and relations.*” (Pg.9). According to Haythornwaite (1996), actors (“nodes”) could be individuals, groups, organizations, and these actors form relationships (“ties” or “edges”) among themselves. She describes a relationship as a specific kind of interaction between actors. Hence, social ties connect actors.

Stockman (2001) identifies some common types of relationships between actors as communication, friendship choices, advice, trust, influence, and exchange relationships which he also cautions are not necessarily reciprocal. Katz et al. (2004) identified other relationships: formal ties, affective ties, material or workflow ties, proximity ties, and cognitive ties. According to Haythornthwaite (1996), relationships are central to social networks because they aggregate into ties, and patterns of ties reveal social networks. She points out that that relationship links pairs of actors who maintain a relationship. For instance, a working relationship links a pair of actors working together. Also, she mentions that pairs can maintain more than one relationship, so their relationships tie them together; hence, a tie describes the combined connections between pairs. While these interactions between actors happen, resources of various types are exchanged between actors. According to Haythornwaite (1996), such resources could be tangible recourses like goods, services, and money or intangible resources such as information, social support, and influence. These relationships form ties between actors, and regular patterns between these relationships culminate in social networks. Finally, Licoppe and Smoreda (2005) talk about “*sociability.*” Sociability is the exchange flow maintained among those tied together - the “*art of living together.*”

Haythornthwaite (1996) identifies content, direction, and strength as three attributes of relationships.

Content: In a relationship, the exchange of different resources such as social material, money, and goods, among other things, takes place between pairs (Garton, Haythornthwaite, & Wellman, 1999).

Direction: Relationships have directions whereby resources flow in specific directions among actors (Haythornthwaite, 1996). The flow direction can be symmetrical, asymmetrical, resources flowing only in one direction, or undirected where the flow is either not measured or is considered not relevant.

Strength: This is the intensity of a relationship describing the frequency, number of things, or amount of information exchanged between actors (Haythornthwaite, 1996). According to Garton et al. (1999), relationship strength can differ due to the amount of content exchanged and the frequency at which this is done.

Social networks, which result from relationships between actors, as pointed out by Haythornthwaite (1996), have network density and tie strength and centrality of nodes as some of their key descriptors (Kadushin, 2012).

Network density also referred to as 'connectedness,' is the extent to which individual actors in a network are linked together (Prell (2011). Network densities make spreading ideas, rumors, and diseases possible (Kadushin, 2012), with increased network density favoring the spread. Kate et al. (2010) argue that network density can stimulate trust, commitment, and cooperation and increase the flow of information within a network. According to Kudushi (2012), a closely-knit community will have a higher network density than one that is not. A closely-knit community can facilitate a more unified community by providing a source for social support and effective transmission of information in a community. For example, villages' relatives, friends, and church attendees tend to know one another as these villages tend to have greater network densities than modern cities (Kadushin, 2012). As each member of a dense network is tied to one another, members tend to control and influence the behaviors of each member (Kate et al., 2010).

Network centrality refers to the position of an actor in a network structure (Wasserman & Faust, 1994). According to Prell (2011), understanding the position of an actor in a network can help explain some things regarding a particular network. For example, one can explain who is important in that network, which makes things happen, and who holds the network together in case of distress. A highly centralized network has one or a few individuals presenting most ties in the network (Kate et al., 2010). Assessing an individual's centrality in a network, according to Haythornthwaite (1996), can reveal which actor or actors have power or influence and who is

more or less in demand in that network. Kate et al. (2010) point out that a central network gives a structure that connects individuals and gives them easy access to other network members. Hence a highly centralized person in a social network can influence the adoption of an innovation (Kate et al., 2010).

Granovetter (1973) defines tie strength as “a combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie” (Pg. 1361). According to Haythornthwaite (1996), tie strength depends on the number and types of relationships a pair maintains and the strength of each relationship. She further says that tie strength is necessary for evaluating the connectedness of actors in an environment. Closely tied individuals tend to have intimate ties. Strong and weak ties are two different perspectives social ties can be looked at (Granovetter, 1973). These ties facilitate various types of resources in a social network (Haythornthwaite, 1996). According to Granovetter (1973), actors who share strong ties tend to influence one another more than those sharing weak ties. These actors tend to trust one another, are more accessible, and are willing to share (Haythornthwaite, 1996). However, weak ties are characterized by less intimate and frequent communication and distant and infrequent relationships; they draw a broader set of contacts and knowledge resources, thereby bridging disconnected network segments (Granovetter, 1973). According to Kadushin (2012), weak ties facilitate information flow from distant parts of a network; an individual without weak ties will be deprived of information from distant parts of a social system and only confined to views of close friends.

3.2.4.1 Theory Underpinning the Social Networks

Social network theory focuses on transmitting information through social relationships (Granovetter, 1985; Liu et al., 2017). Granovetter (1973) studied how people got information about job offers and came up with the strength of weak ties theory. In this theory, people cannot get new information such as job opportunities from networks with which they already have strong links. This is because people could already be privy to information on that network. However, weak ties link brings new information not already known in one's network. According to Katz et al. (2004), strong ties are necessary when individuals are looking for socioeconomic support, which involves a high level of trust. Weak ties are essential when individuals seek information not available among their close or frequent contacts. According to Granovetter (1985), the social structure of a relationship in a network affects individuals' behaviors, beliefs, and attitudes (Borgatti & Foster, 2003). AlHinai et al. (2007) point out that individuals'

perceptions, opinions, and actions are usually influenced in some ways by the networks they belong to.

3.2.4.2 Social Network-member

A social network is a sequence of dyadic links or interactions (Dicken et al. 2001; Tilly 2005). As individuals connect and interact with others in their daily activities, they become members of a social network(s) (social network-member) and thus develop and play social roles in the social network(s) they belong to (Forestier et al., 2012). As part of a community, a social network-member will interact with others in their daily activities, talk, and share with others in a social network(s) what he/she sees, thinks, and experiences (AlHinai, 2007).

Therefore, as a social network-member, individuals' choices and behaviors are guided by people in their sphere of influence, such as friends, family, colleagues, and others. Thus, an individual's decisions and behaviors are influenced by the opinions and recommendations of other important people. Therefore, interpersonal social networks are important and can influence individuals.

3.2.4.3 Social Network-Member Role in Influencing Individual's Behaviour to Adopt Technology

Researchers have argued that analysis of an individual's social network can explain how individuals accept technology (Sykes et al., 2009; Verbraken et al., 2012). Sykes et al. (2009) point out that social network constructs can significantly enhance our understanding of system use over and above individual technology adoption predictors. Verbraken et al. (2012) assert that knowledge about a user's social network could help predict a user's intention to use a system instead of an individual's characteristics such as age, gender, and enjoyment in their study on the use of social networks to predict e-commerce adoption. Examining data gathered from 681 persons about their social network and their intention to buy products online, they concluded that there was evidence of social network effect on e-commerce adoption. As people are becoming more dependent on information technology to perform everyday work, it is essential to pay attention to the relationships people weave and draw while accomplishing their work and interacting with information technology (Oinas-Kukkonen et al., 2010).

Mobile technology users are actors embedded in social networks, and according to Coursaris et al. (2002), they interact with wireless technologies for business and personal purposes. Actors belong to one network and several networks with different types of social relationships (Haythornthwaite, 1999). Lu et al. (2003) reiterate this by saying that mobile device users

belong to many social circles. The networks these actors are embedded in influence their behaviors and opinions, and studying these networks may help explain how they adopt technology (Kate et al., 2010). Lu et al. (2003) indicate that in a mobile technology environment, a mobile technology user of data services requires some social network members to use the same feature for him/her to use the service.

Technology adoption can be facilitated or impeded in a social system whose membership is individuals, groups, or organizations (Rogers, 2003). Backstrom et al. (2006) state that individuals form social groups through interactions. These groups evolve as they attract new members. They take some shape and eventually develop within the more extensive social network in which they are embedded. Kempe et al. (2003) also point out that a social network is a fundamental medium for spreading information and ideas and influencing its members. Lu et al. (2003) also argue that individuals' social network(s) can influence their beliefs, behaviors, and attitudes.

The improved diffusion rate of mobile technologies in developing economies has brought social development opportunities (Mimbi et al., 2010). In most African countries, migrant workers are committed to maintaining social ties with the rural folks even after spending a substantial amount of time away from them (Morawczynski, 2008). One way of maintaining these social ties is through remittances which are used to keep relations with the rural folks currently being made possible through mobile-phones. These remittances show that migrant workers have not forgotten their obligations to the village even as they live in urban areas. In Kenya, for example, 30% of rural households depend on remittances for survival. In addition, the significant wage differential between the urban and rural dwellers and poor rural economies necessitates sending remittances to the countryside (Kabbucho et al., 2003).

Various channels have existed to facilitate remittances in cash and kind, with the informal channels, such as using friends and family, being the most popular, more so with low-income earners. Mobile technologies, on the other hand, as pointed out by Kusimba et al. (2013), are creating a new form of social and communal life. Morawczynski (2008) argues that through mobile technology, users can facilitate remittances between the urban migrant to rural areas more efficiently and securely than before the introduction of mobile money. She further says that these remittances are helping in maintaining social ties between the urban migrants and the rural people. According to Kusimba et al. (2013), mobile technologies are recasting long-standing

traditions of reciprocity through a new form of social interactions. Morawczynski and Pickens (2009) further posit that mobile money in Kenya has reached a critical mass of users and has created network effects. New users can tap into an already extensive network of remitters and lenders, with many users in the rural areas exploiting the potential of the network(s) to increase their income flows.

A report by the Consultative Group to Assist the Poor (CGAP) titled “The Power of Social Networks to Drive Mobile Money Adoption” indicates that the more people a user can exchange and transfer money with through mobile technology, the more interested in mobile money these people are likely to be (CGAP, 2013). Thus, this shows that social networks and interactions around a mobile money user influence behavior towards mobile money technology. In Kenya, there is an increase in mobile money technology within an individual’s network for school fees payment, family upkeep, farming, and business (Morawczynski, 2008). These are social roles urban migrants must perform to maintain their families in the rural areas. Mobile technologies are now being used to enact some of these social roles. It is easy and secure to send remittances to one’s social network through mobile technologies. A case in point is where an immigrant had to convince her mother to sign up for mobile money as an easy, convenient, and secure method to get remittances, though, with some difficulty here and there at first in using the technology; she finally got used to it (Morawczynski, 2008). The ease with which money and remittances are sent in a user’s social network influences behavior toward adopting mobile technologies and, consequently, the adoption of m-commerce.

3.2.4.4 Measuring the Social Network-Member Role

Sparrowe and Liden (2005) point out that individuals in a work environment use informal networks to access valuable information, resources, and opportunities. Resources such as task advice and strategic information are transmitted through informal networks in an organization (Sparrowe et al., 2001). In their daily activities, individuals use social relations that they have built-in their social networks to seek and offer advice, help, information, and support when required. Today, this can be performed more effectively and conveniently through a mobile phone. Therefore, this study stipulates that a mobile-phone user is a social actor who interacts with other members of a social network(s) through the mobile-phone device. In doing so, they play a social network-member role in their daily activities within their embedded network(s). As a social network-member, a mobile-phone user can seek or provide information, advice, help, and guidance to others on various issues. In this study, to measure the social network-member

role the advice-seeking construct will measure the extent to which individuals seek help, advice, or information from others (kin, close friends, and relatives) in their network(s). The advice-giving construct will measure how individuals offer information, help, or advice to facilitate others in a social network(s).

The section above has discussed social networks, theories underpinning social networks, social network-member, social network-member role in influencing an individual's behavior to adopt technology, and finally, how this study will measure the social network-member role. Table 6 below summarizes constructs employed in the proposed study's conceptual model

Table 6: Construct employed in the proposed study's conceptual model

Role	Description	References
M-commerce Activities	Mobile-phone users adopting m-commerce activities, content delivery, transaction, and entertainment	Cullen & Kabanda (2018); Ali et al. (2019); Pandey & Chwala (2019); Chan & Chong, (2013); Chong et al., (2012); Rahman, (2013); Ngai & Gunasekaran (2007)
Technology-User Role	A role mobile-phone users play in their daily activities, including communicating and performing other actions through the mobile-phone or information technology.	Mwangi & Brown (2014); Rajabion, (2015), Huo et al. (2011); Catchapero & Park, (2010); Alhinai et al. (2007); Pedersen et al. (2002)
Consumer Role	A role mobile-phone users play in their daily activities to make payments for goods and services and make purchase-related decisions	Rajabion, 2015; Huo et al. 2011; Catchapero & Park, 2010; Alhinai et al. 2007; Pedersen et al. 2002
Social Network-Member Role	A role mobile-phone users play in their daily activities as members of a social network(s) they are embedded as they interact with others within the network(s) to seek or give advice.	Rajabion, (2015); Sykes et al. (2014); Huo et al. (2011); Catchapero & Park, (2010); Alhinai et al. (2007); Pedersen et al. (2002); Morawczynski (2008); Kusimba et al. (2013); Granovetter (1985); Huo et al. (2011); AlHinai (2007); Rogers (1995); Kim et al. (2007)

3.3 Research Hypotheses Development

This section develops hypotheses that are used to test the proposed conceptual model in Figure 4 to provide a deeper understanding of the factors that influence m-commerce activities (content delivery, transactions, and entertainment) adoption in developing economies.

3.3.1 Technology-user Role Context

The technology-user role, in general, refers to an individual already interacting with a mobile-phone. It is a role mobile-phone users play in their daily activities, such as communicating and performing other actions through the mobile-phone or information technology (Rajabion, 2015; Mwangi & Brown, 2014; Huo et al., 2011; Catchapero & Park, 2010; Alhinai et al. 2007; Pedersen et al. 2002). Individuals interact with the mobile-phone to access communication-oriented services such as voice calls, text messaging, and other complex services, including money transfer, mobile banking, mobile money transfers, payments for goods and services, gaming, and entertainment.

Individuals have interacted with information technology for work over the years and have been required to visit a fixed physical location such as an office to access computing services (Venkatesh & Davis, 2003; Lyytinen & Yoo, 2002). Therefore, information technologies have historically been studied from the context of fixed devices used by individuals in organizations and outside the workplace (Scheepers & Scheepers, 2004). Today, individuals interact with IT (mobile technologies) whenever and wherever they require them as they move across different social contexts (home, office, meetings, etc.) and on the move (Lyytinen & Yoo, 2002).

Information systems research identifies perceived ease of use of a technology and perceived usefulness as important factors in the technology acceptance model (TAM) to predict the acceptability of an information system (Davis, 1989; Venkatesh & Davis, 2003, Lee et al., 2003). Davis (1989) defines perceived usefulness as “*the degree to which a person believes that using a particular system would enhance his or her job performance.*” This factor has been extensively used in information systems studies to explain an individual’s behavior towards a new technology (Hong et al., 2008; Venkatesh et al., 2003). Perceived ease-of-use refers to “*the degree to which an individual believes that using a technology would be free of physical and mental effort.*” Empirical data support perceived usefulness and perceived ease-of-use as primary predictors of mobile technology adoption (Phan & Daim, 2011; Conci et al., 2009; Hong et al., 2008; Sarker & Wells, 2003).

Researchers have indicated that people will appropriate a technology if they find it useful and easy to use and if it fits their daily lives (Carroll et al., 2003). Chong (2013) argues that mobile technology users are becoming more familiar with mobile devices as they become useful in performing various tasks and are easy to use. For instance, Morawczynski (2007, 2008) carried

out studies in Kenya that showed a population already using mobile-phones and embracing them for other use such as money mobile money transfers. The mobile-phone was also used in other innovative ways as a money store for future use, making payments for utility and school fees (Kiringai et al., 2010; Morawczynski, 2007). The mobile-phone users in Kenya found mobile money helpful technology and helped save time; it provided a secure method of sending money and a cheaper means to transfer money considering what was previously used. Also, the mobile-phone perceived ease of use allowed the majority of users to find it easy not only to make calls but also to send text messages and perform money transfer activities. With time, individuals become more familiar with mobile-phone devices as they learn to use them, and they become easy to use. They also become useful to users by allowing them to conduct transactions without time and space constraints. IS researchers have argued that perceived usefulness and perceived ease of use positively influence the intention to adopt a technology (Pipitwanichakarn & Wongtada, 2018; Chong, 2013; Faqih & Jaradat, 2015). Therefore, mobile-phone users will adopt m-commerce activities because of the perceived ease of use and usefulness. This study presents the following hypothesis:

Hypothesis 1: The perceived ease-of-use of the mobile-phone positively influences the adoption of m-commerce activities.

Hypothesis 2: The perceived usefulness of the mobile-phone positively influences the adoption of m-commerce activities.

Researchers have argued that perceived price or cost is a major component required in the operation of m-commerce (Dongmo et al., 2020; Cedeno, 2019; Yadav et al., 2016; Wei et al., 2009). It is one reason that can slow down the m-commerce uptake (Wei et al. 2009). Perceived cost is defined as the degree to which an individual perceives IT as costly (Wei et al., 2009). Luarn and Lin (2005) identified cost as made up of the initial purchase of the handset, usage, subscription, service, communications, maintenance, and upgrade costs. For example, Anil et al. (2003) found cost to be one of the factors that influenced the adoption of m-commerce in Singapore. Wei et al. (2009) also argued that cost could be an obstacle to the effective progression of m-commerce. Dongmo et al. (2020) found that perceived cost significantly influences behavioral intention, therefore, the individual's intention to adopt m-commerce. Perceived cost negatively influenced the behavioral intention to take the adoption decision. Other

adoption studies have also shown that cost has a negative relationship with an individual's intention to adopt technologies such as 3G/4G networks which are an essential channel to deliver m-commerce activities (Chong, 2013; Ong et al., 2008; Xin, 2004, Agarwal et al., 2007). Therefore, this study identifies cost as playing an important role in adopting m-commerce activities. High costs can discourage mobile-phone users from adopting m-commerce activities, and thus this study proposes that:

Hypothesis 3: The perceived high cost of mobile technology negatively influences the adoption of m-commerce activities.

Trust is an important predictor of technology adoption (Chong, 2013; Wei et al., 2009; Cho et al., 2007). Trust is defined as “*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another*” (Rousseau et al., 1998). McKnight (2012) points out the importance of trust. He argues that trust helps individuals to prevail over perceptions of uncertainty and risk. Gefen et al. (2008) also argue that trust helps build an appropriate and favorable expectation of performance and other desired benefits. Researchers have pointed out the uncertainty and risk associated with the m-commerce environment (Nguyen and Huynh, 2018; Chong, 2013; Gefen et al., 2008; Cho et al., 2007). In an m-commerce environment, buyers and sellers transact without meeting face-to-face; therefore, trust becomes essential compared to traditional commerce. Cho et al. (2007) also recognize information asymmetry when transacting in m-commerce environments. According to Pavlou (2003), information asymmetry is the difference in the amount of information between the buyer and seller. Cho et al. (2007) say this can lead to opportunistic behavior. For example, a buyer may misrepresent a product's quality to the seller, leading to mistrust. M-commerce users also fear their personal information and payments being intercepted and later used without their knowledge (Luarn & Lin, 2005). Some studies on m-commerce adoption show that trust is critical in adopting m-commerce (Mashagba et al., 2013; Chong, 2013). For example, Chong (2013) points out that privacy risks and security in m-commerce can be pretty high as mobile devices store users' personal information, and vendors can access this information. Perceived trust has been shown as positively related to the intention to use m-commerce (Pipitwanichakarn and Wongtada, 2018), to adopt e-payments and m-payments (Nguyen and Huynh, 2018; Shin, 2009), to use e-banking (Sanchez-Torres et al., 2018; Zhang et al., 2018), to adopt m-banking

(Shaikh et al., 2015). This study, therefore, espouses trust as a key element in m-commerce activities adoption and presents the following hypothesis:

Hypothesis 4: The perceived trust in mobile technology positively influences the adoption of m-commerce activities.

3.3.2 Consumer Role Context

The consumer role perspective makes a significant difference between m-commerce and traditional technology adoption research (Rajabion, 2015, Huo et al., 2011; Catchapero & Park, 2010; Alhinai et al., 2007; Pedersen et al., 2002). M-commerce users are customers paying for using technology and services they receive (Alhinai et al., 2007). M-commerce users make payments to use technology and go through a decision-making process when purchasing goods and services using mobile technologies. Such interaction may not be a key determinant for traditional technology adoption.

Researchers have described m-payments as using mobile devices to access payment services (Yan & Yang, 2015; Zhou, 2015). This includes account inquiries, making money transfers, and paying bills. Using m-payments frees users from temporal and spatial constraints by enabling them to perform payment transactions anytime from anywhere, thus providing greater convenience. Kshetri and Acharya (2012) point out that technological advances, favorable socioeconomic conditions, and the high penetration of mobile devices are factors driving m-payment uptake and use. For instance, a report by Gilpin (2014) indicates that in Kenya, the mobile money transfer system has revolutionized millions of citizens regarding how they access banking services, no matter how isolated they are in remote areas. Today, mobile-phone penetration in Kenya is at 103%, and they are used for varied services, including m-banking and m-payments, among other services (CA, 2019). Kenya today leads other African nations regarding m-payments to pay for a broad range of products and services. Kim et al. (2010) indicated that users use m-payment systems to support their financial requirements when they find them useful for financial transactions. They further pointed out that full utilization of an m-payment system must be simple to learn and use. As m-payments become easy-to-use and useful in one's social life, mobile technology users using m-payments will adopt m-commerce activities. Therefore, this study hypothesizes that:

Hypothesis 5: The perceived ease-of-use of m-payments positively influences the adoption of m-commerce activities.

Hypothesis 6: The perceived usefulness of m-payments positively influences the adoption of m-commerce activities.

In consumer behavior, researchers have argued that individualism is progressively seen as central to the consumer when choosing between alternative products (Lin, 2011; Sproles & Sproles, 2005; Smith & Sivakumar, 2004; Lysonski et al., 1996). Consumers seem to shop with some basic decision-making approaches or styles; a phenomenon referred to as the “*consumer decision-making style*.” Park and Gretzel (2010) view consumer decision-making as chiefly describing how individuals purchase. Consumer decision-making style is then defined as “*a mental orientation characterizing a consumer's approach to making choices*” (Sproles & Kendall, 1986, Pg. 268).

Wang et al. (2004) mention that decision-making styles differ regarding consumer preference for buying goods and services. Park and Gretzel (2010) also point out that different purchasing modes, online purchasing or offline purchasing, influence consumer decision-making styles. Factors such as website design, product availability, and e-service quality influence consumers' decisions when buying goods and services electronically (Dash & Kumar, 2014). The decision-making styles of online consumers are also other factors that influence online consumers. Sproles & Kendal (1986) developed eight mental characteristics of consumer decision-making approaches.

The perfection-conscious decision style is concerned with quality, making decisions based on methodical comparisons between products (Kang et al., 2014; Park and Gretzel, 2008). Such consumers search for the best or highest quality product using a systematic search (Rezaei, 2015; Lysonski and Durvasula, 2013). According to Sproles and Kendal (1986), perfection-conscious consumers are those who thoroughly search for the best quality products possible. They have high standards and expectations for consumer goods and are concerned with the functions and quality of goods. Consumers with this characteristic do not settle on products that are just good enough, but they go for high-quality products (Bakewell & Mitchell, 2003; Kamaruddin & Mokhlis, 2003). According to Mowen et al. (2007), previous studies have found that quality-conscious consumers were more likely to seek information about goods and services from others. These consumers are also more likely to shop online (Cowart & Goldsmith, 2007). As perfection

or quality-conscious consumers seek product information and shop online, they will likely adopt m-commerce activities. This study, therefore, proposes that:

Hypothesis 7: Perfection-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Brand-conscious consumers are those who are concerned with getting the most expensive and more well-known brands. Price is a quality pointer for this type of consumer (Sproles & Kendal, 1986). Expensive and renowned brands drive this decision-making style (Alavi et al., 2016; Kang et al., 2014). According to Cowart and Goldsmith (2007), brand-conscious consumers are likely to perform online purchasing because they can find information about the brand's image and reputation of the products online from other shoppers. To reduce the risk associated with online purchases, they choose a brand with a better retail image (Rezaei, 2015). Consumers shopping and trying to find brand information online will adopt m-commerce activities, and this study, therefore, proposes that:

Hypothesis 8: Brand-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Novelty-variety-conscious consumers prefer novel and innovative products and are excited by looking out for new items (Sproles & Kendal, 1986). They are mindful of new styles and trends (Lyonski & Durvasula, 2013). According to Park and Gretzel (2010), novelty or fashion consumers seek to get extraordinary and atypical items quickly and efficiently. They derive pleasure from buying (Zhou et al., 2010). Studies have also shown that novelty-consciousness positively impacts online apparel shopping (Cowart & Goldsmith, 2007). Novelty-conscious consumers are expected to use mobile-phones to search for new fashion and innovative products and can do this without the limitation of time and space and therefore will adopt m-commerce activities.

Hypothesis 9: Novelty-variety-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Recreational-conscious consumers are those shoppers who seek satisfaction in shopping and do it just for the fun of it (Lyonski & Durvasula, 2013; Sproles & Kendal, 1986). According to Kang et al. (2014), shoppers with this decision-making style consider shopping pleasurable, entertaining, and enjoyable. They often make unplanned purchases from different stores and

browse products at length to enhance the shopping journey (Rezaei, 2016). This decision-making style is tied to how frequent online purchases are made and the amount of money spent online (Coward and Goldsmith, 2007). Dennis et al. (2010) found that consumers who enjoyed shopping online had a positive approach towards shopping through websites and were likely to spend more time on the visited websites. Therefore, mobile-phone users with a positive attitude towards shopping through websites will adopt m-commerce activities. This study, therefore, proposes that:

Hypothesis 10: Recreational-consciousness of mobile-phone users toward shopping positively influences the adoption of m-commerce activities.

A price-conscious decision-making style is concerned with getting the lowest prices in the marketplace (Rezaei, 2015; Kang et al., 2014). These are considered comparison shoppers and are associated with finding preferred items at the best prices possible (Park & Gretzel, 2010). Research shows that these consumers endeavor to acquire the best value for their money (Coward & Goldsmith, 2007; Bakewell & Mitchell, 2003). Shim and Koh (1997) point out that a consumer who is both price-conscious and high-quality-conscious forms a utilitarian shopper. Dennis et al. (2010) noted that social shopping websites gave utilitarian shoppers the advantage of comparing prices and discounts. Today, comparison shoppers are likely to use a mobile-phone to check for prices online and thus adopt m-commerce activities. Therefore, this study proposes that:

Hypothesis 11: Price-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Impulsive consumers are those who never plan their shopping and tend to purchase on impulse. The amount of money they spend on their purchases is not their concern. However, according to Kamaruddin and Mokhlis (2003), impulsive consumers may feel buyer's remorse after they purchase. Studies have shown that impulsive or careless shopping negatively influences comparison-shopping proneness (Park & Gretzel, 2010). Impulsive buyers typically exclude enough required information before a purchasing decision is made. This type of consumer rarely seeks opinions from others and will not have favorable attitudes toward online shopping. M-commerce allows customers to search for products and services effectively and offers them an

assortment of choices (Ng, 2016). Impulsive consumers perceive the m-commerce experience as valuable and enjoyable and enjoy a variety-seeking purchasing experience (Punj, 2011). Researchers have shown that impulsive consumers have a positive relationship with their intention to purchase online (Zhang et al., 2006). This study assumes that the swiftness of online shopping will attract such consumers to adopt m-commerce activities. Thus, this study proposes that:

Hypothesis 12: Impulsiveness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Confused-by-over choices (choice overload) consumers are overwhelmed by the numerous brands and shops to choose from. As a result, they are likely to be overwhelmed in the marketplace. Such consumers find the marketplace confusing, view brands as alike, and seek assistance from acquaintances (Sproles & Kendal, 1986). To decrease the confusion from too much choice, they may ask for recommendations from others and rely on product reviews (Kang et al., 2014). Dennis et al. (2010) found that young women were motivated to shop online when websites provided more product shopping information. Confused-by-over choices consumers will find reviews offered by other online shoppers helpful for them to narrow down on their choices. Thus, consumers confused-by-over choices of products will, therefore, adopt m-commerce activities, and thus this study proposes that:

Hypothesis 13: Confused-by-over choices of mobile-phone users over shopping positively influences the adoption of m-commerce activities.

Habitual/loyal consumers are more likely to have favorite brands and stores and shop at the same stores while buying the same brands each time (Sproles & Kendal, 1986). Such consumers form habits relative to the brands they frequently pick (Kamaruddin & Mokhlis, 2003). According to Konus et al. (2008), brand/retailer/loyal consumers intentionally eliminate other options and concentrate only on their usual favorite brands or channels. Once a habitual/loyal consumer finds a favorite site to shop and a favorite brand to purchase online, they will adopt m-commerce activities. Therefore, this study proposes that:

Hypothesis 14: Habit/loyalty of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

3.3.3 Social Network-member Role Context

Social network-member role context generally refers to an individual interacting with others in a social network(s) that they are embedded. This perspective or role considers factors that relate to the user's environment and interactions with others important to them in their communities or spheres of influence (Catchapero & Park 2010; AlHinai et al. 2007). Haythornthwaite (1999) points out that individuals belong not only to one social network but to different social networks. In each of the networks an individual belongs to, various social relationships form, which is the basis of each of these networks, and social relationships define different networks. These social relations include friendship, family, and work colleagues, among many others. According to Granovetter (1985), the social structure of a relationship in a network affects individuals' behaviors, beliefs, and attitudes (Borgatti & Foster, 2003). AlHinai et al. (2007) also point out that perceptions, opinions, and actions are usually influenced by the network(s) individuals belong to. For example, network members can recommend excellent services to one another and at the same time alert one another about inadequate services. AlHinai et al. (2007) further point out that a decision to adopt or reject a particular service is not due to personal choice. However, it is influenced by others depending on an individual's level of interaction in one's network(s). M-commerce adoption research also shows that influences from the social network and individual adoption decisions influence adoption decisions and behaviors observed within the network (Catchapero & Park, 2010).

In the recent past, information systems researchers have extended the use of social networks to study technology-related phenomena in organizations (Sykes et al., 2009; Alavi & Kane, 2008). For example, Sykes et al. (2009) focused on networks that emerge through informal organizational interactions. Individuals use these networks to obtain help from others, learn how to use an information system, and support where individuals assist others in using new systems. For example, according to Sparrow et al. (2001), workplace advice networks are employees who search for and provide information, assistance, and expert knowledge to perform their jobs. Literature also supports the view that resources accessed through informal social networks in an organization can help employees learn new system features, therefore, gaining skills needed to use the new system (Sykes et al., 2009). Thus, this enhances employees' competence in using new information systems in the workplace, leading to greater use.

In life today, a mobile-phone has become an essential part of it. It is a necessity, a need, and a way of life. This research postulates that individuals using mobile technologies are embedded in

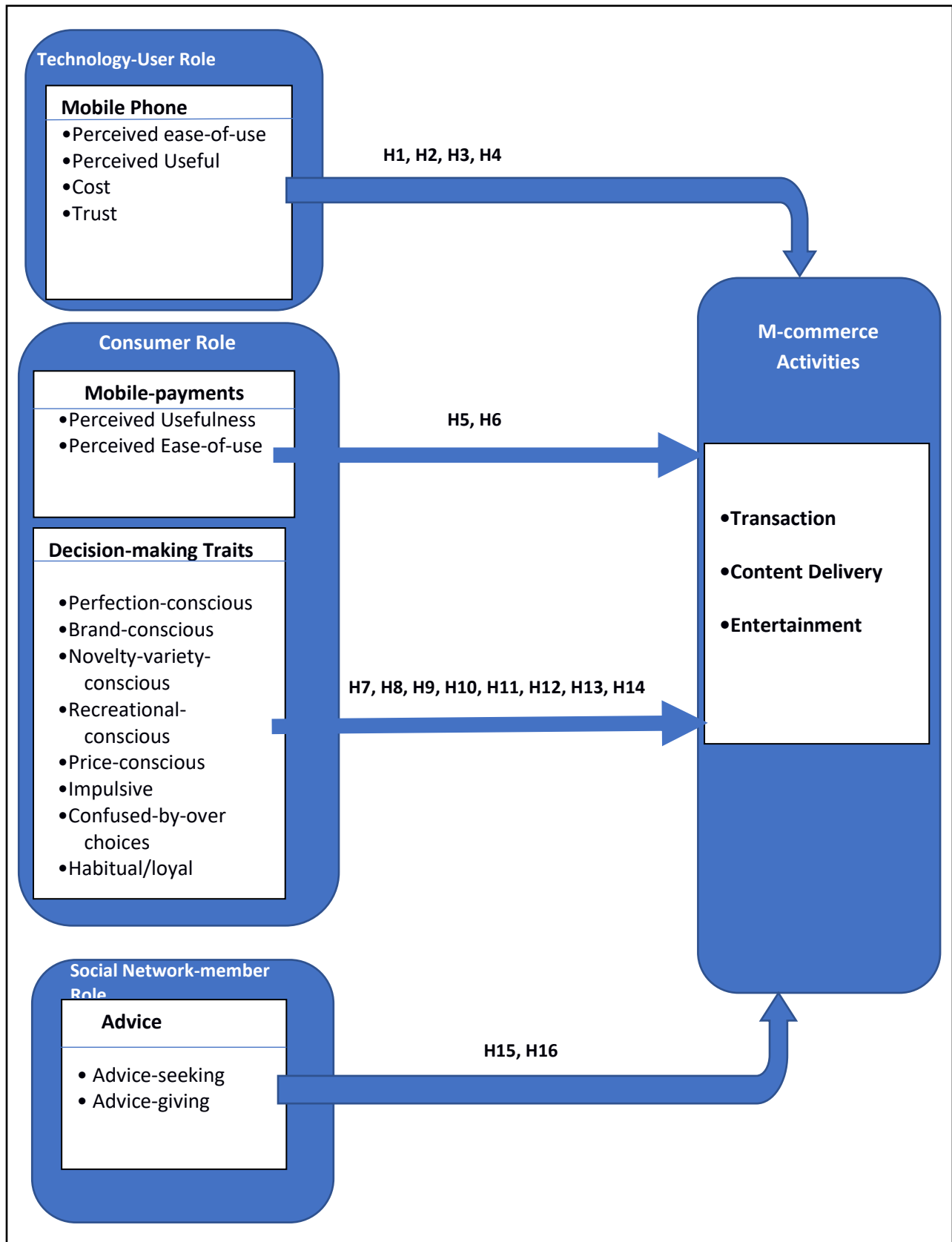
informal networks of friends, relatives, and kinships. Individuals use social relations they have built to seek and, at the same time, offer advice, help, information, and support when required to use a mobile-phone. In this study's proposed conceptual model, the social network-member role is defined by two variables: (1) advice-seeking; and (2) advice-giving. The advice-seeking variable will measure the extent to which individuals interact with their social network(s) to seek help or information about m-commerce activities from others (kin, close friends, and relatives) in their network. The second variable, advice-giving, entails measuring the extent to which individuals interact with others in their social networks(s) to offer information, help, or advice to facilitate others in their network to use m-commerce activities.

Given that individuals in organizations use informal networks to seek help and learn how to use an information system to perform their tasks, this study presumes that mobile-phone users will also seek and provide information or advice to network members. Advice networks will make network members adopt the m-commerce activities. Therefore, this study presents the following hypothesis:

Hypothesis 15: Advice-seeking of mobile-phone users in a social network(s) positively influences the adoption of m-commerce activities.

Hypothesis 16: Advice-giving of mobile-phone users in a social network(s) positively influences the adoption of m-commerce activities.

Figure 4 : M-commerce Activities Adoption Conceptual Model



3.4 Chapter Summary

As discussed in previous chapters, the main objective of this study was to examine the roles played by mobile-phone users and their influence on an individual's behavior to adopt m-commerce activities, content delivery, entertainment, and transactions. This study identifies three roles a mobile-phone user plays by examining the literature on m-commerce adoption, social networks, technology and technology adoption, consumer research, and consumer decision-making styles. These roles are technology-user, consumer, and social network-member. The study further proposed a conceptual model, as shown in Figure 4 above. Further, from the extant literature, this study identifies factors that will influence the dependent variable m-commerce activities adoption. Also, this chapter formulated hypotheses to study the causal relationships between the roles individuals play and the m-commerce activities adoption. The following chapter, Chapter Four, discusses the study's research methodology.

CHAPTER FOUR: RESEARCH METHODOLOGY

4.1 Introduction

The previous chapter identified three roles played by a mobile-phone user, i.e., social network-member role, consumer role, and technology-user role, and included them in the proposed conceptual model. That chapter further identified from the literature the factors this study proposes would influence the adoption of the dependent variable m-commerce activities. Finally, the chapter formulated hypotheses to study the causal relationships between the underlying constructs that will be used to test the proposed conceptual model.

The current chapter reviews the research methodology. The chapter starts by giving an overview of the information systems discipline and research. This is followed by discussing the social science research philosophical foundations and how information systems research is related to social science inquiry. The chapter further looks at the three widely used research philosophies (paradigms) in information systems inquiry and the choice of the research philosophy for the present study. This is followed by the research design processes, data collection and analysis of data, and questionnaire development process. Finally, ethical issues observed when executing this study are highlighted. The chapter concludes by presenting a summary of the discussions in this chapter.

4.2 Philosophical assumptions underpinning information systems research

From the information systems standpoint, positivist, interpretivist, and critical perspectives are the three broad philosophical foundations used to inform information systems studies (Orlikowski & Baroudi, 1991). Historically, a positivist philosophy has underpinned information systems research (Minger, 2001; 2002b). For example, a survey by Orlikowski and Baroudi (1991) on information systems between 1983 and 1988 indicated that most studies were done from the positivist perspective. The information systems field is interdisciplinary, borrows theories and methods, and addresses a range of topics. Since the 1980s, work streams have emerged based on different philosophies (Mumford et al., 1985).

The following section describes the philosophies that underpin much of the information systems research today and their criticism. This will be done from the perspective of Chua's three sets of

beliefs (1986), i.e., physical and social reality, knowledge, and the relationship between theory and practice

4.2.1 Positivist philosophy informing information systems research

With its roots in the natural sciences, the positivist research perspective has dominated information systems research (Orlikowski & Baroudi, 1991). The positivist paradigm holds a deterministic philosophy that the problems studied will a) assess the causes that influence the outcome, b) reality exists out there, and c) knowledge is developed through observation (Creswell, 2009). Blaikie (2010) also describes reality as discrete events that can be observed through the human sense, and knowledge of reality is through experience, and anything that is not experienced is meaningless. According to Blaikie (2010), social reality is a complex causal relation of events based on relations between variables. The causes of human behavior are seen to be external to the individual.

Positivist philosophical assumptions:

The positivist philosophical assumptions are examined using Chua's (1986) framework using the three sets of beliefs, physical and social reality, knowledge, and the relationship between theory and practice.

Beliefs about physical and social reality:

Ontologically, Information Systems research, from the positivist paradigm, undertakes a detached physical and social world that is well captured, categorized, and restrained outside of human existence (Burrell & Morgan, 1979). The researcher discovers social reality and objective physical. The researcher creates paradigms that recognize and estimate the extent of reality relevant to them. According to Chen and Hirschheim (2004), modeling and measurements are used to understand the phenomena by constructing precise devices that measure the phenomena. From the positivist paradigm, the researcher plays a passive and objective role in the investigation to not interfere with the phenomena. For example, Orlikowski and Baroudi (1991) argue that research investigating the relationship between IT and an organizational structure assumes the structure to be objective and the constructs measuring devices that represent the organizational structure.

Beliefs about knowledge:

Creswell (2009) posits that the basis of the positivist's quest for understanding is grounded in the ability of the theories to be empirically tested. The researcher starts with a theory and collects

data that will either support or refute the theory, a process referred to as the hypothetic-deductive explanation. Set methodologies are the sole source of valid understanding and are the only way valid knowledge can be obtained. The techniques used for primary data collection are surveys and experiments, and inferential statistics are used to analyze the methods used to discover causal laws. Orlikowski and Baroudi (1991) posit that positivist studies are based on *a priori* existence that is found within what is being examined. Crucial for the positivist is the validity and reliability of the instruments used to collect data.

Beliefs about the relationship between theory and practice:

The positivist philosophy undergirds a connection between theory and practice that is purely methodical. According to McCarthy (1978), “*if appropriate general laws are known, and the relevant initial conditions are manipulated, we can produce a desired state of affairs, natural or social*” (Pg. 9). It is believed that a researcher can unbiasedly examine and forecast actions or procedures as an impartial observer. Positivist researchers believe that they are disconnected from the object of observation. While this assertion has been made for the natural sciences, this cannot be said of social sciences.

Criticism of the positivist philosophy

Orlikowski and Baroudi (1991) outlined several criticisms of the positivist philosophy. First, the positivist philosophy tends to disregard that human actions could be caused or influenced by historical and contextual conditions. For example, the creation and subsequent usage of IT are fundamentally embedded in the social context, marked by time, environment, politics, and culture. Positivist researchers take no notice of the historical context of the phenomena, such as IT user satisfaction. The researcher ignores the historical context in which the systems could have been used which fundamentally affects the satisfaction level (Orlikowski & Baroudi, 1991).

Another criticism of the positivist philosophy is its tendency to assume that physical and social reality is not a result of conscious involvement (Orlikowski & Baroudi, 1991). Positivist researcher methods encourage a deterministic explanation of phenomena. Because of the focus on the legitimacy and control of the research actions, positivist philosophy has predefined and circumscribed procedures towards the phenomena under investigation.

4.2.2 Interpretivist philosophy of Information Systems research

The interpretivist worldview has mainly a constructionism presumption (Orlikowski & Baroudi, 1991). Interpretivism claims that reality and knowledge are social products and cannot be

understood independently of the social actors that develop and create an understanding of that reality. The interpretivist paradigm, according to Blaikie's (2010) reality, is a product of a process where actors negotiate meaning for actions and situations. He further points out that human behavior depends on how individuals interpret conditions they find themselves in, while everyday meaning and interpretations form the source of knowledge. An explanation of a phenomenon in the interpretivist paradigm consists of descriptions appropriate to the actor's culture. According to Guba and Lincoln (1994), the purpose of the paradigm is to find an agreement towards constructions people hold. The inquirer plays the participant and facilitator's role in understanding and reconstructing what people know. Knowledge is about people's constructions where there is a relative or near consensus about them.

Interpretivist Philosophical assumptions

The interpretivist philosophical assumptions are examined using Chua's (1986) framework of beliefs.

Physical and social reality beliefs

From the interpretive ontological point of view, the human being is constantly constructing and reconstructing reality. Significant to this process is the subjective meaning and social-political and symbolic action involved in that process (Morgan, 1983). Orlikowski and Baroudi (1991) posit that in this tradition, organizational structure or a social relation are not assumed to be objectively known and unproblematic as in the case of positivism. Instead, it tries to know the mechanics that give it status and meaning.

Information systems research, ontologically, assumes individuals, through their deeds and interactions, produce and reinforce the social world; hence, it is not just "given." Apart from humans, the non-existence of organizations, groups, and social systems cannot be apprehended, characterized, and measured objectively or universally. This goes against the positivist argument. A researcher is assumed to be the discoverer of objective social reality, and for the interpretivist, social reality can only be construed. Interpretive researchers also recognize that over some time, interpretation of reality may change as situations, goals, and populations change; meanings are formed, transferred, and used while at the same time negotiated (Orlikowski & Baroudi, 1991).

Beliefs about knowledge:

Rosen (1991) argues that the epistemological belief of the interpretivist is that the social process is not understood in assumptive deduction, co-variances, and levels of freedom. It instead

understands the social process involved in assuming the world of those creating it. According to the interpretivist, the human language used to describe social practices makes up those practices Olikowski and Baroudi (1991). To understand those practices, one must immerse oneself in that social world. This allows one to understand how traditions and meaning of language and implicit norms, shared by people working towards some shared goal, are formed and informed.

In order to generate valid interpretivist knowledge, field studies are the appropriate research methods employed to examine humans within their social setting. The researcher does not impose externally defined categories on a phenomenon; instead, constructs are derived from in-depth interviews and exposure to the phenomena. The social world is understood from the participant's perspective.

Theory and practice Beliefs:

According to Chua (1986), theories are used to explain the action and understand the creation and recreation of social order. Interpretive science does not seek to control empirical phenomena; it has no technical application but aims to enrich people's understanding of the meaning of their actions, thereby increasing mutual communication and influence (Chua, 1986).

Olikowski and Baroudi (1991) argue that in interpretive research, the researcher cannot assume a value-free stance because he/she is always implicated in the phenomena under study. The researchers' assumptions, beliefs, values, and interests they bring into the study shape the interpretivist research.

Criticism of the interpretive philosophy:

According to Olikowski and Baroudi (1991), the examination of the interpretivist point of view does not include the normal external conditions which bring about particular meanings. It fails to explain the unintended intentions of the humans' concerns, which frequently are a formidable force in constructing social reality. Unfortunately, fundamental diverges within society are not addressed by interpretivist philosophy. It does not address inconsistencies, which are part and parcel of social systems. It also disregards historical change — The evolution and definitions of social orders and their likely change over time.

4.2.3 Critical Theory of Information Systems Research

According to Guba and Lincoln (1994), critical theory aims to critique and transform the social, political, cultural, economic, ethnic, and gender structures that constrain and exploit humankind

from historical ignorance and misapprehension. Advocacy and activism are the key concepts in this philosophy.

Critical philosophical assumptions

These are examined in terms of Chua's (1986) three beliefs.

Physical and social reality Beliefs

Ontologically, critical philosophy posits that history plays a role in determining the dynamic social reality that human beings, organizations, and societies experience; that individuals can recognize their potential and capacity and work to change that reality (Chua, 1986)

Beliefs about knowledge

Critical perspective epistemological beliefs are entrenched in social and historical practices (Chua, 1986). Therefore, the research method of choice is long-term historical and ethnographic studies.

Beliefs about the relationship between theory and practice

The association between theory and practice is that the researcher's goal is to awaken the consciousness to the limitations of the status quo (Olikowski & Baroudi, 1991). According to Olikowski and Baroudi (1991), this ignites change in social relations and practices and eliminates alienation and domination.

Criticism of critical philosophy:

Critical philosophy has its critics as well. Social class is considered the primary determinate of antagonistic social relations, ignoring factors like race and gender, leading to dominating and repressive social relations (Olikowski and Baroudi (1991).

The above section has examined the philosophies underpinning information systems, their assumptions, and criticism; the following section presents the present study's research philosophy.

4.3 Research Philosophy Informing the Present Study

Due to the diversity in the information systems discipline, Robey (1996) argues that IS researchers should take responsibility for justifying their choices of research aims, theoretical foundations, and research methods and communicating their rationale. For that reason, this section justifies the philosophical foundation underpinning the present study.

4.3.1 The researcher's ontological stance

According to Burns (2000), scientific studies are pragmatic and impartial; therefore, the research questions posed in the present study may not be answered by subjective approaches. This study acknowledges a lack of inherent understanding of mobile-phone users' roles and their influence on the adoption of m-commerce activities, content delivery, entertainment, and transactions. Therefore, this study seeks to uncover knowledge on what influences m-commerce activities adoption through scientific methods. First, scientific discovery's precondition is objectivity; second, objective approaches decrease subjective interpretations of the results. This is achieved by documenting the study protocols, availing data, and the study methodology for inspection by other scientists, thus, allowing other researchers to have a chance to authenticate the results by trying to replicate them.

From an objectivist perspective, only one true reality exists. Hammersley (2000) argues that the researcher must be unbiased when trying to capture and present this single reality. This study adopts an objectivist perspective that admits that the world is structured regardless of people's understanding. However, the external environment drives subjective human behavior. In this regard, human behavior is best understood through observation and reasoning, and such understanding relies on sensory experiences obtained through observation and experimentation. This perspective is appropriate for the present study, which seeks to model and test the factors of m-commerce activities adoption. Measures are quantified, i.e., their selections are drawn from work highlighting accurate measures and analyzing target concepts influencing human behavior to adopt technology. The research questions allude to the testing of factors that influence mobile-phone users towards adopting m-commerce activities. Thus, answers to these inquiries require objectivity from the researcher. In pursuing objectivity, biases that are pegged on the researcher's beliefs will be eliminated. This will be achieved by providing protocols that are scientifically documented. These protocols can be used in replicating and validating the study's results. The use of a self-administered data collection instrument allows the elimination of the researcher's bias. Thus, respondents are presented with survey questions without the involvement of the researcher or an assistant. According to Nagel (1986), this approach allows for generalization that is context and time-free.

4.3.2 The Researcher's epistemological stance

4.3.2.1 Discharging other views from the study

This study discharges the interpretivist and critical theorist views as perspectives because they do not distinguish between personal experience, fact, and value judgment and science. Therefore, views of this nature may not definitively answer questions such as those posed in this study, unlike the positivist approach.

1. What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?
2. What influence does the technology-user role of a mobile-phone user have on the adoption of m-commerce activities?
3. What influence does the social network-member role of a mobile-phone user have on the adoption of m-commerce activities?

Thus, the positivist perspective is appropriate for responding to the abovementioned questions, given that the studied phenomenon has an objective reality. Straub et al. (2004) state that objective reality can be presented through causality and reported precisely.

4.3.2.2 Selecting the Positivist View for the study

In light of the earlier discussion on positivist and objectivist views, this study argues for objective reality and subscribes to a positivist epistemological point of view.

To achieve the study goals and respond to the questions above, positivism holds that universal laws govern m-commerce adoption. These universal laws are understood through the systematic observation and documentation of events of the phenomena within the research setting. The thorough working of the underlying principle that causes individuals' behavior towards adopting m-commerce activities is the next step in achieving the study goals. This approach aligns with the worldview that the phenomena have an objective reality, which can be conveyed in causal relationships and measured using data in a representative and precise method (Straub et al., 2004). The core of positivist research is to uncover the objective physical and social reality by modeling specific measures that will identify the dimensions of reality sought by the researcher (Orlikowski & Baroudi, 1991).

Furthermore, *a priori* fixed relationships within a given phenomenon are often examined with structured instruments to validate the theory, which helps to advance predictive knowledge of a

phenomenon (Orlikowski & Baroudi, 1991). The positivist doctrine asserts that a given phenomenon is structured and exhibits constancy. Thus, the researcher's goal is to identify the patterns and consistencies and then report them in the form of causation (Cecez-Kecmanovic, 2005). As such, causal laws are instructive in controlling and predicting technology use, user behavior, and attitudes towards technology (Cecez-Kecmanovic, 2005).

4.3.2.3 Application of the Positivist View in the Study

This study identifies factors from consumer behavior, information systems, social networks, and psychology literature to understand individuals' intent to adopt m-commerce activities. First, a survey will be used to collect mobile-phone users' responses. Subsequently, the study employs a quantitative approach in dealing with the multivariate data that assesses responses to examine *a priori* fixed relationships. The results will aid this study in revealing patterns and consistencies of individuals' behavior towards adopting m-commerce activities and report them as causation.

The characteristics of the positivist approach then lend themselves to this study's aims to predict individuals' behaviors towards adopting m-commerce activities. A testable model was then designed to examine the study's independent variables (social network-member role, technology user role, and consumer role) influence the dependent variables m-commerce activities (content delivery, entertainment, and transaction).

This section above has discussed philosophies underpinning social science research, their assumption, criticism, and the philosophy informing the present study; the following section presents a discussion on the research design.

4.4 Research Design

A research design is a blueprint indicating how data is collected, measured, and analyzed (Pinsonneault & Kraemer, 1993). Therefore, the researcher uses a plan to answer the questions or test the hypotheses that motivated the research in the first place. The research design essentially answers three key questions: what, why, and how:

1. What are the underlying assumptions for the research at hand (addressed in Section 4.3)?
2. How will the researcher be conducting the research? This requires specifying the data collection and analysis

3. Why is the chosen research plan best suited for the study at hand? This requires justifying the choice made.

This study employed a survey research design. Surveys allow information collection through oral or written questioning (Sarantakos, 2005). According to Neuman (2003), surveys are suitable for research questions about self-reported beliefs or behavior and are strong where answers to the research questions measure variables. Besides, they are also used in descriptive or explanatory research. He also points out that sampled respondents answer similar questions to measure several variables and test multiple hypotheses to infer temporal order from questions about past behavior, experiences, or characteristics. According to Creswell (2009), one can study a population sample to understand the quantitative description of a population's trends, attitudes, or opinions. The results are then generalized from the sample studied to the population. A survey research design is ideal where covering an entire population is not possible. With proper sampling methods, one can use an appropriate representative sample size drawn from the population. Advantages of using a sample instead of a population, the turnaround time for collecting data from a sample is shorter, and the method is cost-effective given scarce resources (Creswell, 2009).

4.5 Time Frame

Research questions and other research issues incorporate a time element in different ways, making the time dimension a critical aspect of research (Neuman, 2011). For example, Neuman (2011) points out that a study can give a picture of a fixed time point or other studies permit the following of events, people, or social relations over a specified period. Blaikie (2010) identifies three basic choices for a social researcher concerning time, cross-sectional studies, longitudinal studies, and historical studies. According to Blaikie (2010), cross-sectional studies capture a snapshot of aspects of social life at a given time, while longitudinal studies are a series of cross-sectional studies involved in taking a snapshot of events either two points in time before and after or at several points in time. Historical studies deal with social events or phenomena in the past. This study was a cross-sectional study, where data was collected from a selected sample representing a population to indicate what was happening to the population at that point in time. With a cross-sectional study, one can safely generalize findings from the sample to the population at the point in time the survey was conducted, though it limits making causal inferences given that the study is conducted at one point in time and temporal priority is difficult to establish (Pinosonneault & Kraemer, 1993).

4.6 Type of data collected

Blaikie (2010) distinguishes the types of data a researcher deals with as primary, secondary and tertiary. He states that primary data is generated by the researcher who applies methods they control to produce the data. In contrast, secondary data is a dataset generated by another researcher, achieved, and made available to other researchers for analysis. The researcher is one step removed from the data. Tertiary data is already analyzed data. Blaikie (2010) also identifies two primary forms of data that are in the form of words (qualitative data) or numbers (quantitative), which Neuman (2011) differentiates as soft data and hard data. According to Neuman (2005), these forms of data dictate different research strategies and data collection techniques and offer to give the difference between qualitative and quantitative research. Blaikie (2010) also argues that data in a research project can be changed between the two forms, commonly from words to numbers.

Creswell (2009) describes quantitative research as examining the relationship among variables by testing theories. He further says that quantitative studies use numbers analyzed using statistical measures. Simultaneously, qualitative research gathers data through observation and interviewing of participants, then uses inductive data analysis to build patterns, categories, and themes from the data.

4.7 Data collection

Since this was quantitative research, quantitative data were collected from respondents and were statistically analyzed to answer the study's research questions. Quantitative data offer the advantage of using numbers to quantify observations, make them more explicit and eventually make them easier to aggregate, summarize and compare data which can then be statistically analyzed. However, with quantitative data, there is a potential loss of richness in meaning compared to qualitative data (Babbie, 2007).

The data collection instrument suitable for collecting quantitative data is a questionnaire. Questionnaires enable data collection standardized, allowing inference of the results to the broader population when gathered from a representative sample.

Questionnaires offer the following advantages, according to Bryman (2012):

- i. They are economical to administer and offer advantages, especially when the sample is geographically widely dispersed.

ii. They allow for similar assertions and questions to respondents, thus making the data collection process consistent.

iii. The researcher is not part of the evidence collection; hence bias is mitigated.

However, using questionnaires for data generation assumes that the researcher and the respondents share underlying assumptions about language and similarly interpret statement wording. In addition, the use of closed questions restricts the depth of the participant's response. Qualitative data collection methods may be more appropriate when little is known about a phenomenon or subject area (Rattray & Jones, 2007).

4.8 Data analysis

The aim of the study determines the data analysis process appropriate for the questions to be answered, and this is determined by whether the study is exploratory, descriptive, explanatory, or predictive (Pinosonneault & Kraemer, 1993). Blaikie (2010) identifies four main categories of quantitative methods of data analysis. First, univariate descriptive methods are used to report the distribution of a sample or population and generate concise measures of the characteristics of such distribution, such as frequency counts, measures of central tendency, and measures of dispersion. Second, bivariate descriptive methods are used to establish the degree to which two variables covary. Third, explanatory methods are used to establish the influence of one or more independent variables on a dependent variable. Fourth, methods such as factor analysis, path analysis, and regression are employed. According to Creswell (2009), inferential analysis relates variables to draw inferences from the sample to a population. Bhattacharjee (2012) further points out that inferential statistics provide statistical procedures that conclusions can be arrived at about associations between variables when used. Inferential statistics differ from descriptive statistics in that they are used to describe, aggregate, and present the constructs of interest or associations between these constructs. Therefore, inferential statistics are designed explicitly to test hypotheses.

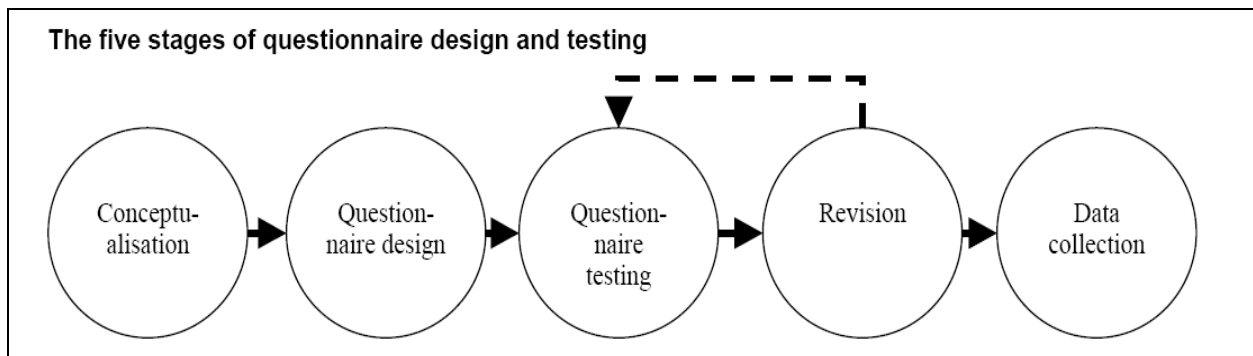
4.9 Questionnaire design and development

The instrument to measure the roles played by individuals through mobile phones in influencing them towards adopting m-commerce activities in Kenya was developed by reviewing the literature to identify constructs and variables to be used. Questionnaire design is a process and involves five stages as described and depicted below (Brancato et al., 2006):

- i. Conceptualization and operationalization – establishing the survey variables and translating them into observable variables. It is crucial to ensure that the concepts and indicators the study requires are compatible with what the respondents have in mind.
- ii. Questionnaire design – this starts with deciding the thematic sections of the questionnaire and the wording of each question that translates the target variables into concrete questions.
- iii. Questionnaire testing – is done to discover problems in the survey design, such as poorly-phrased questions.
- iv. Revision – to adjust the survey design accordingly based on the test findings and then test the revised questionnaire to ensure validity
- v. Data collection – implementation of the survey and terminating the instrument's iterative development and revision process

These stages are summarized in Figure 5 below:

Figure 5: Questionnaire development as a process



Source: Brancato et al., 2006

The constructs in the conceptual model (Figure 4) were operationalized from existing measures in previous studies. They were adapted and modified to fit the present study. Some items that could not be found in the literature were developed, but these new items were based on conceptualization and theories that existed in theories. Four main configurations were identified in this study: (i) consumer role, (ii) technology-user role, (iii) social network-member role, and (iv) m-commerce activities adoption. Construct dimensions, and their measures were derived from literature and existing questionnaires. Constructs were measured using multiple-item scales,

drawn from pre-validated measures in IS, and reworded to relate specifically to the context of m-commerce activities adoption.

4.9.1 Dependent variables

M-commerce Activities

Several studies investigating m-commerce adoption have been done from a broad perspective without providing details on the sorts of m-commerce activities individuals interact (Chan & Chong, 2013). Mahatanankoon et al. (2005) divided m-commerce applications into four categories: content delivery, transactions, location-based, and entertainment. As described earlier in the present study, content delivery is the use of m-commerce to perform activities such as surfing to search for information. In contrast, transaction activities deal with the financial exchange between customers and businesses. M-commerce entertainment activities include accessing music, videos, or games online through mobile devices. Chan and Chong (2013) point out that these m-commerce use activities have been empirically validated and align with a detailed literature review by Ngai and Gunasekran (2007). The significant uses of m-commerce, according to Wei et al. (2009), are entertainment and content browsing. This study adopted three of the m-commerce activities users interact with, namely: content delivery (5 items), transactions (4 items), and entertainment (3 items) (Chan & Chong, 2013). A five-point Likert-type scale with 1 - “Strongly disagree” to 5 - “Strongly agree” as the endpoint was used (see Appendix B). M-commerce activities were measured by the extent to which the mobile-phone user carries out these m-commerce activities. Table 7 below presents a summary of the questionnaire constructs and related details.

4.9.2 Independent variables

Technology-user role construct:

The construct technology-user role is a well-established phenomenon in IS research. It is in line with technology adoption research, and most factors studied relate to the technology or service characteristics and their use (Alhinai, 2007). Mobile-phone’s physical mobility makes possible usage behavior not generally associated with other traditional forms of computing (Scheepers et al., 2006). This study conceptualized the technology-user role as a role a mobile-phone user plays in their daily activities using a mobile-phone for communication and performing other actions. Five mobile-phone user beliefs about using mobile-phones were derived from literature and previous studies (Chong et al., 2012; Chan et al., 2013). The study measured the extent to which mobile-phone users believed mobile-phones were easy to use (EU1 – EU4), mobile-

phones were useful (U1 – U6), they could trust mobile-phones (T1 – T3), and were cost-effective (C1 – C5). A Likert-type scale of 1- “Strongly disagree” to 5 - Strongly agree” was used to measure mobile-phone users’ beliefs indicators (see Appendix B).

Consumer Role Construct

This study conceptualized the construct consumer role as the payments and decisions a mobile-phone user makes while performing m-commerce activities. As previously stated, the construct consumer role makes the fundamental difference between m-commerce adoption research and other traditional technologies adoption research (Alhina, 2007). Consumers pay to perform m-commerce activities and go through a decision-making process while engaging in m-commerce activities. The construct m-payment was derived from the literature (Schierz et al., 2010; Dahlberg et al., 2003; Mallat et al., 2004; Linck et al., 2006) and was measured by the extent mobile-phone users found m-payments were useful (UMP1 – UMP4) and m-payments were easy to use (EUP1 – EUP4). A five-point Likert-type scale with endpoints 1: “Strongly Disagree: to 5:” Strongly Agree” was used to measure m-payments indicators (see Appendix B). Likewise, the consumer decision-making style construct was derived from the literature (Sproule, 1985; Sproule & Kendall, 1986; Park, 2007; Bakewell & Mitchell, 2003). Consumer style inventory (CSI) dimensions by Sproule and Kendall (1986) measure eight mental characteristics of decision-making, perfectionist-conscious customer (PCC1 – PCC6), brand-conscious customer (BCC1 –BCC7), novelty-variety-conscious customer (NVC1 – NVC5), recreational shopping-conscious consumer (RSC1 – RSC5), price-conscious consumer (PCC1 –PCC3), impulsiveness-conscious consumer (ICC1 – ICC5), confused-by-over choices customer (COC1 – COC4), and habitual/loyal consumer (HLC1 – HLC4) were used. In their study, Bakewell and Mitchell (2003) altered the CSI question item wordings despite being done in English. This was to aid UK respondents’ comprehension and hence reduce measurement error. For this study, some of the original CSI items were re-phrased in line with Bakewell and Mitchell (2003) to aid Kenyan respondents in comprehending the question items easily. A term such as “store” was replaced with “shop.” A five-point Likert-type scale with 1- “Strongly disagree” to 5 - “Strongly Agree” as endpoints were used to measure the extent to which mobile-phone users perform the eight mental decision-making styles.

Social network construct

Researchers have previously argued that an individual’s social network(s) can explain how individuals accept technology (Sykes et al., 2009; Verbraken et al., 2012). Social networks’

construct in this study was conceptualized as a role a mobile-phone user plays in their daily activities as a member of a social network they are embedded as they interact with others (such as kin, relatives, close friends, and neighbors) in one’s social network(s). According to Sykes et al. (2009), network density and centrality are important structural characteristics that capture individuals' social exchange patterns and interactions. They can be used to model how an individual obtains help, the get-help network, and how individuals provide help to others, the give-help network. The study measured the extent of advice-giving and advice-seeking from other mobile-phone users. The advice-seeking construct was measured using six items (GET 1 – GET 6) using a Likert-type scale of 1 - “Strongly disagree” to 5 - “Strongly agree” (see Appendix B). Likewise, the construct’s advice-giving was measured using four items using a Likert-type scale of 1 - “Strongly disagree” to 5 - “Strongly Agree.”

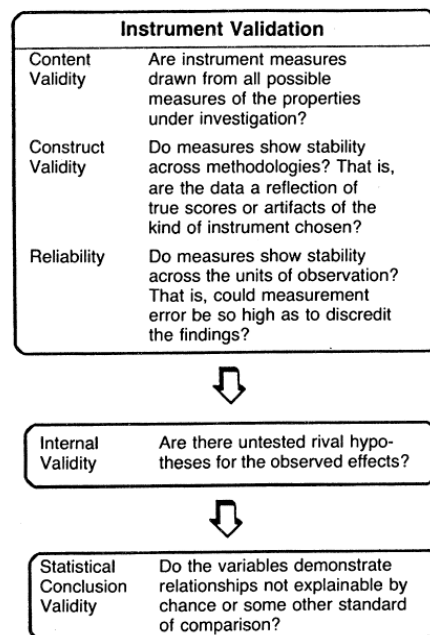
Table 7: Constructs, Dimensions, Items, and References

Technology-user role:	Mobile-phone beliefs <ul style="list-style-type: none"> • Perceived Ease-of-use • Perceived Usefulness • Trust • Cost 	4 items 6 items 3 items 5 items	Chong et al. (2012); Chan et al. (2013)
Consumer role:	Payment for products and services <ul style="list-style-type: none"> • M-payment Perceived Usefulness 	4 items	Bhattacharjee (2001), Devaraj et al. (2002), Heijden (2003)
	<ul style="list-style-type: none"> • M-payment Perceived Ease-of-Use 	4 items	Bhattacharjee (2001), Davis et al. (1989), Taylor & Todd (1995), Venkatesh & Davis (2000)
	Consumer decision-making styles <ul style="list-style-type: none"> • Perfection-conscious • Brand-conscious • Novelty-variety-conscious • Recreational-conscious • Confused-by-over choices • Price-conscious • Impulsiveness • Habitual/loyal consumer 	5 items 4 items 3 items 4 items 4 items 6 items 5 items 4 items	Sproles & Kendall (1986); Park, (2007); Bakewell & Mitchell (2003)
Social Network Member Role	Social interactions <ul style="list-style-type: none"> • Advice-seeking • Advice-giving 	6 items 4 items	Sykes (2015); Sykes et al. (2014); Sykes et al. (2009)
M-commerce Activities	M-commerce Activities <ul style="list-style-type: none"> • Content delivery • Transaction • Entertainment 	5 items 4 items 3 items	Chan & Chong (2013); Mahatanankoon et al. (2005); Ngai & Gunasekran (2007)

4.10 Study Instrument validation

Testing the data collection instrument for validity and reliability is important. According to Neuman (2011), reliability and validity are fundamental issues for all measurements. In order to maximize reliability and validity, it is recommended to use an existing data collection instrument (Straub et al., 2004; Kim, 2009; Straub, 1989). However, Straub (1989) argues that even though researchers often adopt instruments from previous studies, they risk adapting instruments previously not validated. At times, researchers could have made significant changes in the validated instrument without re-testing it. The present study did not have an existing instrument for collecting data, and the researcher developed one from literature and previous studies. Figure 6 below shows the different instrument validations and steps to be used.

Figure 6: Questions answered by the validities



Source: Straub, 1989

4.10.1 Reliability

It is important that reliability, that is, the dependability and consistency of a questionnaire in a study, be demonstrated. When a research instrument is reliable, it means that the results produced do not change because of the instrument used; measurements should be the same when repeated under the same conditions (Bryman, 2012, Neuman, 2011). The use of Cronbach's α statistic is a popular way to demonstrate a questionnaire's repeatability, stability, or internal consistency (Rattray & Jones, 2007). Inter-item correlation is used to determine whether

constituent items measure the same domain. It is also used to show if items show good internal consistency; Cronbach's α should be above 0.70 per construct for developing questionnaires and above 0.80 for established questionnaires (Bryman, 2012).

4.10.2 Validity

Validity has to do with how well the researcher conceptualizes the idea. It requires a fit between the researcher's constructs used to describe, theorize or analyze the social world and those in it (Neuman, 2011). According to Bhattacharjee (2012), this is the extent to which a measure sufficiently represents the underlying construct it is supposed to measure. Theoretical or empirical approaches are used to assess the validity; ideally, both approaches should be used. The theoretical assessment of validity focuses on how well the theoretical construct is translated or operationalized. This type of validity is called representational validity, which consists of face validity and content validity. According to Bhattacharjee (2012), face validity refers to whether an indicator seems to be a reasonable measure of its underlying construct "on its face." Hair et al. (2014) further posit that this form of validity determines the instrument's accuracy in capturing relevant data, which is an integral part of the data collection process.

A pilot test was conducted in one of the Sub-Counties, Kasarani, to check face validity. This was conducted to ensure that respondents:

- Understood the questionnaire instructions
- Satisfactorily interpreted the questions and answered them as expected
- Used the scale items appropriately
- Completed the questionnaire within the given time.

Thirty (30) responses were collected during the pilot for preliminary statistical analysis. Following the pilot study, item wording was changed for clarity and the time required to complete the survey.

Content validity assesses how well a set of scale items matches the construct's relevant content domain that it is trying to measure (Bhattacharjee, 2012). According to Boudreau et al. (2001), reviewing the literature can accomplish content validity. Boudreau et al. (2001) also propose using expert opinion. This study's survey instrument was presented for review to an IS Professor who also serves as an IS journal reviewer to ensure content validity. His feedback determined that the survey instrument was appropriate for the objective of this study.

Further, an empirical validity assessment examines how well a given measure relates to one or more external criteria based on empirical observations. This is referred to as criterion-related validity and includes convergent, discriminant, concurrent, and predictive validity. Bhattacharjee (2012) describes these validity tests as follows:

- Convergent validity — the closeness with which a measure relates to (or converges on) the construct that it purports to measure,
- Discriminant validity — the degree to which a measure does not measure (or discriminates from) other constructs that it is not supposed to measure,
- Predictive validity — is the degree to which a measure successfully predicts a future outcome that it is theoretically expected to predict and,
- Concurrent validity — examines how well one measure relates to another concrete criterion that gives the convergent validity results presumed to occur simultaneously.

Statistical techniques such as correlational analysis, exploratory factor analysis, and confirmatory factor analysis, among others, are used in this type of assessment based on quantitative analysis of observed data (Bhattacharjee, 2012). Section 5.7.1.1 of this study gives the study data's convergent and discriminant validity results.

4.11 Research site

Several factors determine the selection of a research site. First, this study was conducted in a sampled county (Nairobi), one of the 47 counties in the Republic of Kenya. Kenya is a developing economy with a population of 47.6 million people (KNBS, 2019). According to the Kenya Economic Report (KER) of 2013 by the Kenya Institute for Public Policy Research and Analysis (KIPPRA), 20.1 million people in the population were considered poor with relatively high levels of income inequalities by the year 2010 (KIPPRA, 2013). The report also shows that the dependence ratio in Kenya is estimated at 82.14%. In 2010, Kenya enacted a new constitution that saw 47 counties created. This was with the hope that the counties would play an important role in Kenya's economic development. The counties were envisaged to offer an enabling investment climate that would allow them to attract investments for development. They were also to help in poverty reduction and employment creation. These counties, however, have varied magnitudes of poverty, with a number registering upward of 70% poverty levels

compared to the national average of 46% (KIPPRA, 2013). With such high poverty levels, especially in the rural areas, the Kenya Economic Report (2013) indicates that the urban population is growing at 4% per annum. This can be attributed to people moving from rural areas to urban centers in search of opportunities.

As stated, Nairobi county was chosen as the data collection site. Kenya's economic hub comprises 11 Sub-Counties — Dagoretti, Embakasi, Kamukunji, Kasarani, Kibra, Lang'ata, Makadara, Mathare, Njiru, Starehe, and Westlands with a population of 4.39 million people as per the 2019 census (KNBS, 2019). According to UN-Habitat, 60% of Nairobi's population lives in slums (UNHABITAT, 2008).

4.12 Sampling

According to Bhattacharjee (2012), “sampling is a statistical technique of selecting a segment of a population of interest to examine and make statistical inferences about it” (Pg. 65). Sampling is a thorough process researchers follow to include all relevant details that will ensure the rigor and validity of the study's findings (Babbie, 1990). Additionally, it gives a researcher a perspective to select respondents to investigate a phenomenon of interest. The researcher, after that uses the participants' responses to generalize the results to the sampled population (Pinsonneault & Kraemer, 1993). The following section discusses the sampling processes employed in this study.

4.12.1 Sampling frame

According to Wright (2005), a sampling frame is a portion of the population from where a study's sample is taken. Bhattacharjee (2012) points out that this is a part of the population from which the study's sample can be obtained. In this study, the sampling frame constituted listing all mobile-phone subscribers in Nairobi. While the information for mobile-phone subscribers in Kenya is available through the Communication Authority of Kenya (CA), the listing was not readily available for this study to use for sampling purposes.

4.12.2 Sample Population (Unit of Analysis)

Bhattacharjee (2012) defines a sample population as “*all individuals or items possessing the characteristics that a researcher pursues to investigate.*” (Pg. 65). Blanche et al. (2006) posit that the unit of analysis in a study helps specify the element to be examined. This study focuses on determining m-commerce activities adoption using Kenya as a case and a mobile-phone user as the unit of analysis.

4.12.3 Sampling Procedure

Economic factors can divide a population into sub-populations (groups/strata). Therefore, it is expected that the measurement of interest to vary among the different sub-populations. This has to be accounted for when selecting a sample from the population. Therefore, the sample should represent the population and be achieved through stratified sampling. A stratified sample is obtained by taking samples from each stratum or sub-group of a population. When a population is sampled with several strata, each stratum's proportion should be the same as in the population. Stratified sampling techniques are generally used when the population is heterogeneous or dissimilar, where certain homogeneous or similar sub-populations can be isolated (strata).

As discussed above, this study picked Nairobi County as the research site clustered into 11 Administrative Sub-Counties. In each administrative Sub-Counties, the study stratified them into the upper and lower-income social-economic areas.

4.12.4 Population and sample size

The target population for this study was all registered mobile-phone subscribers in Nairobi. To be registered as a mobile-phone subscriber, one must have a national identification card issued upon attaining 18 years. This is the population this study has identified as the one that is likely to adopt m-commerce activities. The study population was 4.39 million Nairobi County residents. This study sample size was 500 Nairobi County residents, slightly over 380 respondents. According to Krejcie & Morgan (1970), as the population increases, the sample size increases at a diminishing rate, remaining constant at slightly more than 380 at a 95% confidence level with a margin of error of 5%, and does not change much for a population larger than 20,000. Krejcie & Morgan (1970) proposed the following formula to calculate the sample size

Equation 1: Sample Size Calculation Formula

$$S = \frac{X^2 NP(1 - P)}{d^2(N - 1) + X^2 P(1 - P)}$$

Source: Krejcie & Morgan (1970)

where:

S = required sample size

X² = the table value of Chi-square for 1 degree of freedom at the desired confidence value (3.8416)

Z = confidence level at 95% (standard value of 1.96)

P = the population proportion

N = the population size

d = the degree of accuracy expressed as a proposition (0.5)

4.13 Survey Instrument Administration

The study used a non-probability sampling method to select the study respondents. It is easier and cheaper to use though it may risk sampling bias. However, the study tried to have a representative of the population from the sample selected. This study's non-probability sampling method was convenience sampling, where respondents were selected from a group of people who were easy to contact or reach by intercepting them in a shopping center. The intercept method is cost-effective and guarantees prompt, high-quality, accurate data collection (Bush & Hair, 1985). Osah (2015) cites Case et al. (2013) and Thorgersen and Zhou (2012) as some of the researchers that have noted the above considerations as some of the advantages of using the intercept method.

In contrast, a fundamental constraint is that it can limit the generalization of findings. In order to mitigate this constraint, data was collected in all Nairobi Sub-Counties. Each Sub-County was thus stratified into the upper and lower classes. This study trained ten (10) research assistants to distribute the study's survey instrument to respondents. An equal proportion of respondents were selected in each of the sub-County strata. Intercepted respondents were not screened for any particular characteristics and were requested to participate in the study. Once they agreed, they were given a questionnaire to fill. No incentives were given for a respondent to participate in the study. Data collection for this research was conducted for two months between April 1st, 2016, and May 25th, 2016. A total of 500 questionnaires were distributed see Appendix A.

4.14 Ethical and confidentiality issues

Research ethics refers to a wide variety of values, norms, and institutional arrangements that help make up and control scientific activities (NESH, 2016). According to the Norwegian National Research Ethics Committees (NESH), research ethics codifies scientific morality in practice. According to Freed and Taylor (1994), social science involves investigating complex economic, legal, cultural, and political phenomena. Due to the complexity involved, social science research must ensure "moral integrity" to build confidence in the research process and the findings (Biber, 2005). Researchers have addressed ethical issues when conducting social science studies (Freed-Taylor, 1994; Biber, 2005; Mollet, 2005). These are part of social science research when dealing with human subjects. Issues covered in the present study included voluntary participation, anonymity, and confidentiality of respondents' information. In this study, participation was optional and voluntary. Respondents had a right not to respond to any questions. They could also withdraw their participation at any time. This study treated

respondents' information with confidentiality as this information was to be used for academic purposes only. Respondents' identity was anonymous see Appendix A.

4.15 Chapter summary

The chapter started by giving an overview of the information systems discipline and research. This was followed by discussing social science research's philosophical foundations and how information systems research relates to social science inquiry. The chapter further looked at the three widely used research philosophies in information systems inquiry and the choice of the research philosophy for the present study. This was followed by the research design processes, data collection and analysis of data, and questionnaire development process. Finally, the chapter highlighted ethical issues observed when executing this study. The next chapter presents the analysis and findings of the study's data.

CHAPTER FIVE: ANALYSIS AND RESULTS

5.1 Introduction

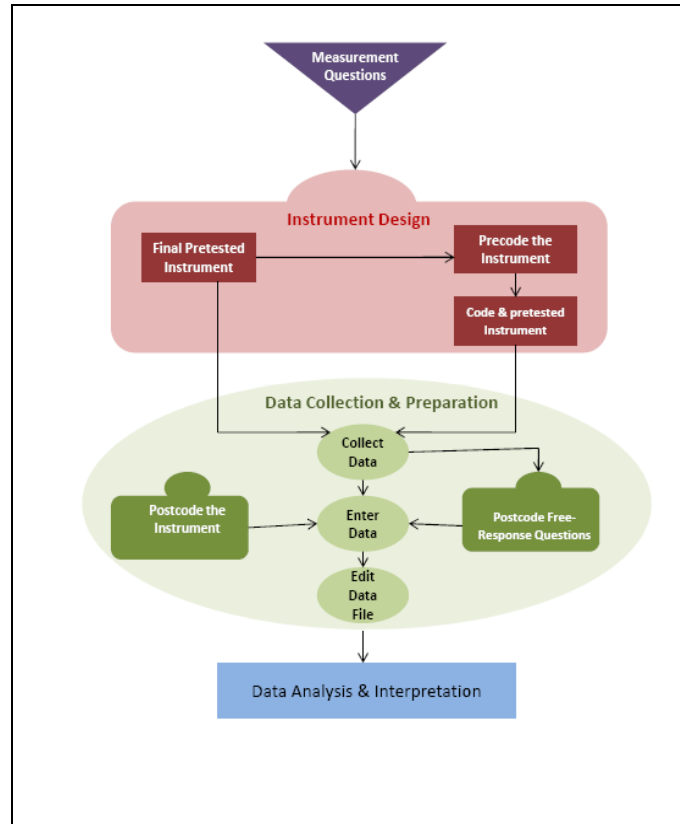
This chapter presents the data analysis results. The chapter further includes hypotheses testing results and validates the study's conceptual model. Section 5.2 presents the process for preparing this study's data for analysis, including data editing, coding, and screening. Section 5.3 presents preliminary data analysis, which gives descriptive statistics of the study's respondents. Further, section 5.4 presents independent sample t-tests, and ANOVA performed on the respondents' demographics to identify possible differences between respondents in this study about adopting m-commerce activities. Section 5.5 presents the research instrument reliability tests. Section 5.6 presents research model validation. Following this section is section 5.7, which reports the PLS-Structural Equation Modeling results. Finally, a summary of the chapter is presented in section 5.8.

5.2 Data Preparation

Of the 500 questionnaires distributed, 467 were returned, representing a response rate of 93.4%. Therefore, a total of 467 respondents participated in the study. Thirty-three questionnaires could not be accounted for. Mugenda and Mugenda (2003) indicate that a response rate of 70% is considered very good for data analysis. Therefore, this study's response rate of 93.4% was found to be satisfactory.

Data analysis involves reducing accumulated data to a manageable size, developing data summaries, looking at patterns, and applying statistical techniques to convert it into knowledge (Cooper & Schindler, 2006). The first step before analyzing data is data preparation. According to Cooper and Schindler (2014), "data preparation includes editing, coding, and data entry- it is the activity that ensures accuracy of the data and their conversion from raw form to reduced and classified forms that are more appropriate for analysis" (Pg. 376). Data preparation is a process that comes after data has been collected and before they are analyzed to examine them for completeness and validity (Hair et al., 2007). Once the research instrument has been designed and pre-tested, the next stage is data collection and preparation. Figure 7 below shows the steps used to prepare data for the present study.

Figure 7: Data preparation in the research process



Source: Cooper and Schindler (2014)

5.2.1 Data Editing and Coding

Before data can be used, they must be edited. Cooper and Schindler (2014) indicate that the aim of editing is “to guarantee that data are accurate, consistent with the intent of the questions and other information in the survey, uniformly entered, complete and arranged to simplify coding and tabulation.” (Pg. 377). This is performed to check whether the respondents understood the questions and followed the instructions regarding answering the questions (Hair et al., 2007). The data editing stage further checks to eliminate questionnaires with a significant proportion of missing data, where a questionnaire probably exceeds 10% of the missing data as a general rule of thumb.

In the present study, all the responses for the study were entered into the SPSS version 26 application. This allowed the data to be saved in SPSS format and as a CSV file, which other applications can use.

The coding process consists of assigning numbers, labels, and item codes to individuals' responses and grouping these into categories. In the present study, the coding procedure adopted was pre-coding, meaning an item code for each measurement statement in the questionnaire has already been assigned. The table in Appendix J shows item codes, measurement statements, and constructs used in this study.

5.2.2 Data screening

This is the process of checking for missing data and identifying outliers. First, data screening ensures that no data is missing and that all the data has been inputted accurately. Next, the process used to screen for missing data, outliers, and data normality for the study's sample data is outlined.

5.2.2.1 Missing data assessment

Data is deemed missing when participants or cases are not available for one or more variables of interest. Typically, this happens when respondents fail to answer some items on the questionnaire either accidentally, refuse to answer, or do not know the answer to some items. Hair et al. (2010) indicate that the "researcher's primary concern is to identify the patterns and relationships underlying the missing data to maintain as close as possible the original distribution of values when any remedy is applied" (Pg. 41). They further point out the importance of examining missing data from a practical and substantive perspective. Missing data reduces data available for analysis, and also any statistical results based on random missing data could be biased. In response to this, Hair et al. (2010) have recommended a four-step process to examine and identify missing data and recommended some remedies to apply as described below.

Step 1: Determine the type of missing data.

The first step is to identify the data that is missing. Two classifications have been provided for such data - ignorable and nonignorable. For ignorable missing data, specific remedies are unnecessary. In contrast, nonignorable missing data could be due to known or unknown reasons. Whatever the reason, the researcher must progress to the next step to assess the extent and impact of the missing data.

Step 2: Determining the scope of missing data

The second step is to determine the level of the data that is missing. This is done by examining the number of variables with missing data vis-à-vis the number of cases with missing data for each variable. According to Hair et al. (2010), it is generally suggested that any individual case

with more than 10% of missing data is to be removed as long as it occurs in a specific, non-random manner. The rule of thumb also suggests the need not to substitute the missing data where the number of responses is enough to carry out a chosen statistical analysis.

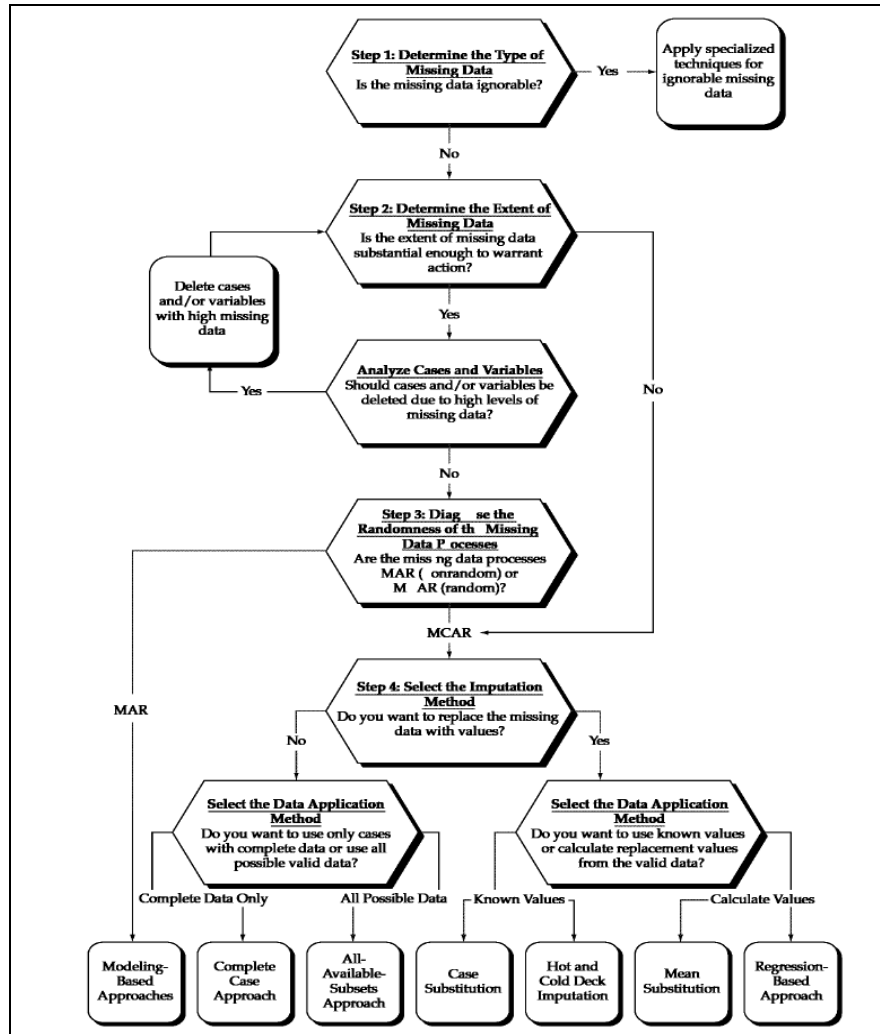
Step 3: Diagnosing the randomness of the missing data process

The third step is to check how random is the missing data. Hair et al. (2010) observe that the researcher needs to determine whether the data is missing at random (MAR). This is where the chances for data to be missing are entirely random. On the other hand, they also observe that data could be missing completely at random (MCAR). This is where there is an observed ordered connection between the chances of missing data and the observed data, but not the missing data.

Step 4: Elect the imputation methods.

Hair et al. (2010) suggest seven different imputation methods. These methods include model-based methods, the substitution of cases, hot and cold deck imputation, substituting using the mean, imputation through regression, and completing the data. All these methods have their advantages and disadvantages.

Figure 8: Missing data identification - a four-step process



Source: Hair et al., 2010

Figure 8 above illustrates a researcher's steps when faced with missing data. In the present study, it was expected that **Part A** – demographic data of the questionnaire would have missing data. Respondents are usually reluctant to provide information related to income. In addition, respondents are at liberty to refuse to respond to any background-related questions. Therefore, this did not require any remedy.

The main questionnaire sections in the present study were **Parts B** through **E**. It was assumed that the respondents would complete all the question items. However, on examining the data set, missing data were found. Therefore, the percentage of missing data per variable was examined, the variable with the highest missing data was 5.8%, occurring in a specific non-random manner, the missing data in **Parts B** through **E** in this study was ignored, and statistical software was to take care of them during analysis.

5.2.2.2 Assessment of Outliers

Checking for the presence of outliers is the beginning of studying the distribution of variables. Hair et al. (2010) define outliers as “observations with a unique combination of characteristics identifiable as distinctly from the other observations.” They posit that unique characteristics are usually judged by very high or very low scores, thus preventing the normal distribution of data. They further say that a decision must be made on whether to retain or remove an outlier. According to Roni (2014), outliers are data that are significantly distant from the rest in a data set. Outliers can happen by chance in any data distribution, and they are an indicator of either measurement errors or a sample having a tailed distribution. Hair et al. (2010) classified sources of outliers into three classes. (1) Procedural error - these are due to data entry error or mistake in coding; (2) extraordinary event - accounting for the uniqueness of the event; (3) extraordinary observation - a researcher has no explanation for and observations are falling within the ordinary range of values on each of the variable, unique in their combination (Roni, 2014).

Three outlier detection techniques are univariate, bivariate, and multivariate (Hair et al., 2014). This study used univariate and multivariate techniques to detect outliers in the sample data. First, using descriptive statistics, Z-scores were generated for the 467 cases. According to Hair et al. (2014), for a sample size of 80, if an outlier is detected with a standard score of 2.5 or greater, the rule of thumb is to exclude it. In addition, they recommend increasing the standard score's threshold for larger sample sizes up to 4. This threshold was also used in the present study, given that the study sample size was 467. Six cases with Z-scores of greater than four were detected - and deleted. Thus, for the remaining 461 (467-6) cases, descriptive statistics were then run to check for skewness and kurtosis and were within the suggested range of ± 2 and ± 3 , respectively.

Multivariate outliers are cases with an unusual combination of scores on different variables, and these can be detected by calculating and examining Mahalanobis D^2 . According to Field (2007), Mahalanobis D^2 “is the measure of the influence of a case by examining the distance of a case from the mean(s) of the predictor variable(s)” (Pg. 789). Therefore, the probability of Mahalanobis D^2 was also calculated to evaluate outliers. A high score of Mahalanobis D^2 shows that there are cases with extreme values in one or more of the variables. Therefore, researchers have recommended applying a conservative statistical significance test $p > 0.001$ while interpreting the Mahalanobis D^2 score (Hair et al., 2010). In this study, after generating Mahalanobis D^2 and the corresponding probabilities, cases with less than a probability of 0.01

were deleted. Using Mahalanobis D^2 , 42 cases were identified for deletion. Removing these cases reduced the sample size to 419 (461-42) cases.

5.2.2.3 Normality

In multivariate analysis, the primary assumption is normality (Hair et al., 2014). Normality refers to the shape of the data distribution to an individual metric variable and how it corresponds to the normal distribution. Hair et al. (2014) further say that sufficiently large variation from the normal distribution results in all statistical tests being invalid because normality is required in F and t statistic tests.

In multivariate normality, it means individual variables are normal, and when combined, they are also normal (Hair et al., 2014). According to Hair et al. (2010), skewness and kurtosis values can be used to determine sample normality. Skewness measures the distribution symmetry, with a symmetrical distribution having a skewness of 0. At the same time, kurtosis measures the degree to which scores cluster in the distribution tails (Field, 2007). Recommendations differ among researchers on assessing skewness and kurtosis values for normality. For example, acceptable limits for skewness and kurtosis have been suggested as a maximum of <2 and <7, respectively (Hair et al., (2010).

On the other hand, Hair et al. (2003) give satisfactory levels of (-1 to +1 for skewness) and (-3 to +3) for kurtosis, while Azzalini (2005) suggests values of (-2 to +2 for skewness) and (-3 to +3) for kurtosis. Given the differing acceptable values for skewness and kurtosis, this research adopted ± 2 and ± 3 values as an average of the ranges given. Descriptive statistics on all variables for this study were within the mentioned range. Therefore, this study retained 419 cases for further analysis after the data preparation. Table 8 below gives a summary of the descriptive statistics.

Table 8: Research Variables Descriptive Statistic

Descriptive Statistics (N=419)						
	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Content Delivery	1.60	5.00	3.9666	0.72918	-0.969	1.208
Transaction	1.00	5.00	3.8795	0.79497	-0.678	0.229
Entertainment	1.00	5.00	3.4622	1.06255	-0.405	-0.501
Mobile-phone Perceived Ease-of-use	1.00	5.00	4.0334	0.72873	-0.615	0.393
Mobile-phone Perceived Usefulness	1.50	5.00	4.0418	0.63442	-0.427	0.170
M-payment Perceived Usefulness	2.00	5.00	4.3025	0.56560	-0.710	0.968
M-payment Perceived Ease-of-Use	2.00	5.00	4.0430	0.68034	-0.571	0.381
Perfection Conscious	1.00	5.00	4.3002	0.68159	-1.375	3.442
Brand Conscious	1.00	5.00	3.3369	0.77116	-0.281	0.260
Novelty-Variety Conscious	1.00	5.00	3.4458	0.80024	-0.019	-0.261
Impulsive Conscious	1.00	5.00	3.5811	0.77063	-0.168	-0.197
Habitual/Loyalty Conscious	1.00	5.00	3.7160	0.83394	-0.602	0.320
Advice-seeking	1.33	5.00	3.6444	0.73533	-0.608	0.487
Advice-giving	1.67	5.00	3.8632	0.65690	-0.425	0.248

5.3 Preliminary data analysis

The following section provides the preliminary data analysis of the study results.

5.3.1 Respondents' characteristics

This section provides the characteristics of the survey respondents and their background information. Respondents in this study were individuals residing in Nairobi County who had attained 18 years of age and owned a mobile-phone. Kenya laws require that one possesses a national identity card to own a mobile-phone legally. Therefore, this study's respondents were those who had an identification card and owned a mobile-phone. The respondents also resided in Nairobi county when the interview was conducted. Tables 9, 10, 11, and 12 below show respondents' demographic profiles.

5.3.2 Respondents' Profile

Demographics, income, gender, age, and education level are used to segment a sample and give similarities and differences. Demographics capture possible patterns that may provide insights into the phenomena under study. Technology adoption and use researchers have shown the relevance of including demographics in studies (Pedersen, 2005; Dwivedi & Lal, 2007; Tellis et al., 2009; Chong et al., 2012; Chan & Chong, 2013; Niiranen, 2016). Some of the variables that have been included as demographics are Age (Rogers, 1995; Chong et al., 2012; Chan & Chong, 2013), Gender (Rogers, 1995; Chong et al., 2012; Chan & Chong, 2013), Education (Rogers, 1995; Chong et al., 2012; Chan & Chong, 2013), and Income (Rogers, 1995; Chong et al., 2012; Chan & Chong, 2013). Demographics were included in this study in line with the studies mentioned above.

5.3.2.1 Age distribution

Those aged between 18 and 40 constituted the largest proportion of the study respondents – 91%. From table 9 below, 46% of the total respondents were between 18 and 25 years, while 45% were between ages 26 and 40.

Table 9: Respondents' Age Profiles

Demographic Profile Age	Number of Respondents N=419	Percentage %
18 to 25yrs	197	46%
26 to 40yrs	189	45%
41 to 55yrs	18	4%
56yrs and above	2	1%
Missing	16	4%

5.3.2.2 Gender distribution

Regarding the respondents' distribution by gender, 54% of the respondents in this study were male, while 41% were female, as shown in Table 10.

Table 10: Respondents' Gender Profiles

Demographic Profile Gender	Number of Respondents N=419	Percentage %
Male	227	54%
Female	172	41%
Missing	20	5%

5.3.2.3 Education level distribution

The study also looked at the respondents' highest level of education. 20% of the respondents had attained secondary school education, while 40% and 29% had attained college and university education, respectively, as shown in Table 11 below.

Table 11: Respondents' Level of Education Profile

Demographic Profile Highest Level of Education	Number of Respondents N=419	Percentage %
Primary	15	4%
Secondary	84	20%
College	167	40%
University	120	29%
Missing	33	8%

5.3.2.4 Monthly income distribution

Regarding income distribution, most respondents (71%) earned below Kshs.50,000.00 per month, with 41% earning below Kshs. 20,000.00 per month, as shown in Table 12 below.

Table 12: Respondents' Monthly Income Profile

Demographic Profile Monthly Income	Number of Respondents N=419	Percentage %
Below Kshs. 20,000	172	41%
Kshs. 20,000 - 49,999	127	30%
Kshs. 50,000- 99,999	30	7%
Kshs. 100,000 and above	22	5%
Missing	68	16%

The section above has provided the respondents' background. The following section compares individuals' demographic factors in adopting m-commerce activities.

5.4 Comparing Respondents' Demographic on M-commerce Activities Adoption

Previous research has examined respondents' demographic profiles to understand technology adoption (Cutler et al., 2003; Chan & Chong, 2013). For example, Chan and Chong (2013) suggest segmenting users according to their demographic profiles to understand how they interact with various m-commerce activities. This section looks at the respondents' age, gender, income level, and educational attainment to describe differences in m-commerce activities adoption by demographics. This research data was subjected to an independent samples t-test and one-way ANOVA.

In order to establish how different two groups of a dependent variable are, the t-test is performed on the study data. The t-test is used to determine whether the means of the two groups are different (Field, 2007). Statistical significance demonstrates the likelihood that a difference between the samples means actually represents a difference in the population. In this study, an independent sample t-test was performed to compare whether there was a difference between males and females in adopting m-commerce activities and if the difference was enough to be practically significant.

5.4.1 Gender

Studies have shown that males are more interested in technology when compared to females because of being confident in exploring new technologies and having higher self-efficacy when it comes to technology (Teo, 2001; Igarria & Chakrabarti, 1990; Dwivedi & Lal, 2007; Thompson, 2009; Niiranen, 2016; Dixon et al., 2014; José Liébana-Cabanillas et al., 2014). In Teo's (2001) study, technology usage patterns differed between genders. Whereas communication was the motive for internet use for females, males used the internet for downloading and purchasing. However, other researchers have shown that gender barriers no longer matter in some technologies such as m-commerce (Chan & Chong, 2013). This study examined whether m-commerce activities adoption differed by mobile-phone users' gender. In order to compare the mean value between the gender of respondents to the average value of the dependent variable m-commerce activities, an independent sample t-test was performed on the study data. The following section presents the analysis results to compare if there is a difference between males and females in adopting different m-commerce activities.

5.4.1.1 Gender vs. M-commerce Activities

The t-test results revealed that there was no statistically significant difference in the adoption of m-commerce activities between males and females on average. The results also suggest that a mobile-phone user's gender does not significantly affect the m-commerce activities adoption. These results corroborate the Chang and Chong (2013) study. Both males and females browse the internet and search for information. The results are presented below:

The p-value for Levene's test for equality of variance was greater than 0.05. This implies the adoption of the assumption of equal variances ($F = 0.192$, $P=0.662$). The t-test for the significant differences for m-commerce activities amongst the gender was $t(397) = 1.581$; $p=.115$. Since the p-value for the t-test was greater than 0.5, it implies no statistically significant difference in m-

commerce activities between the male and female respondents (or amongst the gender). A summary of the independent sample t-test results of gender vs. m-commerce activities is presented in Tables 13 and 14 below.

Table 13: Independent T-test Groups Statistics – Gender and M-commerce Activities

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
M-commerce Activities	Male	227	3.7720	.62925	.04177
	Female	172	3.8702	.59298	.04521

Table 14: Independent Sample T-test – Gender and M-commerce Activities

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper	
M-commerce Activities	Equal variances assumed	.192	.662	-1.581	397	.115	-.09813	.06206	-.22013	.02388	
	Equal variances not assumed			-1.594	378.697	.112	-.09813	.06155	-.21916	.02290	

A one-way ANOVA test was carried out on this study’s sample data. One-way ANOVA is used to compare the means of three or more samples to make inferences about the population means (Field, 2007). As described earlier in this study, mobile-phone users’ demographics were segmented into income, education, and age to better understand their characteristics regarding m-commerce activities adoption.

Further, this study looked at whether the adoption of m-commerce activities differed by mobile-phone users’ age. The results of the analysis are presented next.

5.4.2 Age

According to Finch (1986), age can explain a particular social class, process, or behavior of an individual or a group, whether explicit or implicit. Cutler et al. (2003) found that younger people used the internet or computers more often than older people, and internet usage was found to

differ in different age groups as they used them for different purposes. In their study, Venkatesh et al. (2000) also found that age groups 15yrs — 17yrs dominated the adoption of computers in the United States, followed by 26yrs to 35yrs. This study sort to determine whether the m-commerce activities adoption differed with a mobile-phone user’s age. This study’s respondents were categorized into the following four brackets; 18yrs – 25yrs, 26yrs – 40yrs, 41yrs – 55yrs, and 56yrs and above. Presented next are the results of the analysis.

5.4.2.1 Age vs. M-commerce Activities

The ANOVA test results indicated no statistically significant difference in m-commerce activities amongst the different age groups ($F_{(3,399)} = 1.392, p = .245$). The results are presented in Table 15 below.

Therefore, the study’s results indicate that an individual’s age does not affect m-commerce activities adoption. Regardless of age, all adopt m-commerce activities. The table below shows a summary of the results.

Table 15: One-Way ANOVA Descriptive – Age and M-commerce activities

ANOVA					
M-commerce Activities					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.595	3	.532	1.392	.245
Within Groups	152.423	399	.382		
Total	154.018	402			

5.4.3 Education

According to Chan and Chong (2013), contradictory findings have been given regarding the relationship between computer adoption and an individual level of education. However, the level of education was a factor in adopting online transactions (Kim, 2004; Chinn & Fairlie, 2006). In Kim's (2004) study, internet use was higher amongst those with a higher level of education. Better knowledge of computers or mobile devices was given as the reason. Those with a higher education level were more likely to use them to carry out online transactions. Chan and Chong (2013) found that educational attainment positively correlated with transactions and location-based m-commerce activities.

This study sought to find out whether m-commerce activities adoption differed with a mobile-phone user’s education level. Therefore, this study’s educational attainment was categorized into the following four brackets; Primary School, Secondary School, College, and University. Presented below are the results of the analysis.

5.4.3.1 Level of Education vs. M-commerce Activities

ANOVA test was performed between the variable education and m-commerce activities. This test was carried out to examine whether there was a statistically significant difference in adopting m-commerce activities among the different user’s education levels. The ANOVA test results revealed a statistically significant difference in m-commerce activities adoption amongst the different education levels ($F_{(3,382)} = 9.853, p = .000$). Furthermore, there existed a difference in m-commerce activities among different education levels: primary school, secondary school, college, and university. Thus, the study’s sample results suggest that an individual’s level of education did affect m-commerce activities adoption. A summary of the results is presented in Tables 16 and 17 below.

Table 16: One-Way ANOVA Descriptives — Level of Education and M-commerce Activities

ANOVA					
M-commerce Activities					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.859	3	3.620	9.853	.000
Within Groups	140.327	382	.367		
Total	151.185	385			

Since there was a statistical significance difference in m-commerce activities across different levels of education, the results of multiple comparison test using Tukey HSD showed that m-commerce activities for those respondents with a primary level of education were statistically and significantly different from those respondents with a secondary level of education ($p=0.001$), with college-level of education ($p=0.000$), and with the university level ($p=0.000$). However, the m-commerce activities with other levels of education were not statistically different.

Table 17: One-Way Anova Descriptives — Level of Education and M-commerce Activities

Multiple Comparisons						
Dependent Variable: M-commerce Activities						
Tukey HSD						
(I) Highest Level of Education	(J) Highest Level of Education	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Primary School	Secondary School	-.63948*	.16989	.001	-1.0779	-.2011
	College	-.83955*	.16337	.000	-1.2611	-.4180
	University	-.68333*	.16599	.000	-1.1116	-.2550
Secondary School	Primary School	.63948*	.16989	.001	.2011	1.0779
	College	-.20007	.08107	.067	-.4093	.0091
	University	-.04385	.08622	.957	-.2663	.1786
College	Primary School	.83955*	.16337	.000	.4180	1.2611
	Secondary School	.20007	.08107	.067	-.0091	.4093
	University	.15622	.07253	.138	-.0309	.3434
University	Primary School	.68333*	.16599	.000	.2550	1.1116
	Secondary School	.04385	.08622	.957	-.1786	.2663
	College	-.15622	.07253	.138	-.3434	.0309

*. The mean difference is significant at the 0.05 level.

5.4.4 Income

Income levels indicate socio-economic status (Jung et al., 2001; Jung, 2008). According to Jung (2008), individuals with higher income are more likely to have access to the internet and better utilize it than their counterparts. Chabossou et al. (2008) point out that developing economies differ in their levels of technology adoption, and usage and income is a factor that influences adoption and usage. They argue that income vastly enhances mobile adoption and is the primary explanatory variable for usage.

This study sought to determine whether the adoption of m-commerce differed by a mobile-phone user's monthly income level. Respondents' monthly income level in this study was categorized into the following four brackets; Below Ksh20,000, Ksh20,000 – Ksh49,999, Ksh50,000 – 99,999 and Ksh100,000 and over. The results of the analysis are presented below.

5.4.4.1 Monthly income vs. M-commerce activities

ANOVA test was performed between an individual's monthly income level and m-commerce activities. This test was conducted to determine whether there was a difference in adopting m-commerce activities among different users' monthly income levels. The ANOVA test results

indicated no statistically significant difference in the adoption of m-commerce activities amongst the different levels of individuals' incomes ($F_{(3,347)} = 0.201$, $p = .896$). Therefore, the study's results indicate that an individual's income does not affect m-commerce activities adoption. Table 18 below gives a summary of the results.

Table 18: One-Way ANOVA Descriptive - Monthly Income and M-commerce Activities

ANOVA					
M-commerce Activities					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.242	3	.081	.201	.896
Within Groups	139.368	347	.402		
Total	139.610	350			

5.5 Model Validation

Model validation is where researchers run PLS algorithms to determine whether the measurement and structural models fulfill the quality criteria for the study's empirical work (Urbach & Ahlemann, 2010). A two-step process is performed, which entails assessing (1) the measurement model and (2) the structural model. The following section discusses structural equation modeling (SEM), focusing on Partial Least Square - Structural Equation Modeling (PLS-SEM).

5.6 Structural Equation Modeling (SEM)

Structural equation modeling (SEM) is a second-generation multivariate analysis method advanced due to limitations in the first-generation multivariate data analysis techniques (Hair et al., 2021). SEM analyzes the inter-relationships between multiple variables in a model expressed in a series of single and multiple regression equations. In SEM, two sub-models, the structural and measurement models, are identified, making the structural equation model. In addition, the SEM method incorporates quantitative data and correlational or causal assumptions into the model.

According to Urbach and Ahlemann (2010), one strength of SEM is its support for latent variables (LVs). Bentler (1980) opines that latent variables are "hypothetical constructs invented by a researcher to understand a research area." Latent variables are not observable and cannot be

measured directly. However, researchers use empirically measurable indicators (Manifest variables), observable ones, to estimate latent variables in a research model. Therefore, using latent variables provides a way to model theoretical constructs that are not easily measured directly, for example, variables such as perceptions, benefits, and intentions. Chin (1998) distinguishes between two types of indicators, reflective and formative. According to Chin (1998), reflective indicators are “effects” of the latent variable, i.e., the latent variables cause or form the indicators, while formative indicators cause or form the latent variable. Urbach and Ahlemann (2010) point out that few researchers have applied formative measurements in their studies, while the use of reflective indicators is prevalent. Another advantage of SEM is its ability to simultaneously estimate a series of inter-relationships among latent constructs in a model. Therefore, it is the most efficient method to handle the confirmatory factor analysis (CFA) for the measurement model, analyze the causal relationships among latent constructs in a structural model, estimate their variance and covariance, and test the hypotheses for mediators and moderators in a model. Also, structural equation modeling (SEM) use is extensive in empirical IS studies (Urbach & Ahlemann, 2010).

This study selected WarpPLS version 8.0 to perform confirmatory factor analysis (CFA) to assess the measurement and structural models. WarpPLS 8.0 applies the partial least square (PLS)-based SEM technique (PLS-SEM). Researchers have made an argument for choosing partial least squares (PLS) SEM over covariance-based (CB) SEM is a statistical means of testing structural equation models, which has become increasingly popular (Urbach & Ahlemann, 2010). The reasons for this choice are:

- PLS makes fewer demands regarding sample size than other methods (ten times rule at least 100)
- PLS does not require normal-distributed input data
- PLS can be applied to complex structural equation models with many constructs (more than six constructs and 50 ties).
- PLS can handle both reflective and formative constructs
- PLS is better suited for theory development than theory testing
- PLS is especially useful for the prediction
- PLS can be applied to various associated indicators for latent variables (1 to 20 and more).

Table 19 below shows the difference between PLS and CB SEM.

Table 19: PLS and Covariance-Based SEM

Criteria	PLS	CBSEM
Objective	Prediction-oriented	Parameter-oriented
Approach	Variance-based	Covariance-based
Assumption	Predictor specification (nonparametric)	Typically multivariate normal distribution and independent observations (parametric)
Parameter estimates	Consistent as indicators and sample size increase (i.e., consistency at large)	Consistent
Latent variable scores	Explicitly estimated	Indeterminate
Epistemic relationship between an LV and its measures	Can be modeled in either formative or reflective mode	Typically only with reflective indicators. However, the formative mode is also supported.
Implications	Optimal for prediction accuracy	Optimal for parameter accuracy
Model complexity	Large complexity (e.g., 100 constructs and 1,000 indicators)	Small to moderate complexity (e.g., less than 100 indicators)
Sample size	Power analysis based on the portion of the model with the largest number of predictors. Minimal recommendations range from 30 to 100 cases.	Ideally based on power analysis of specific model—minimal recommendations range from 200 to 800.
Type of optimization	Locally iterative	Globally iterative
Significance tests	Only by means of simulations; restricted validity	Available
Availability of global Goodness of Fit (GoF) metrics	Are currently being developed and discussed	Established GoF metrics available

Adapted from Urbach and Ahlemann, 2010

5.7 PLS Approach Results

Anderson and Gerbing (1988) outlined a two-step method to evaluate the measurement and the structural model. The measurement model tests the instrument's reliability and validity, while the structural model analyzes and tests the study's hypothesis. First, the researcher examines the relationship between manifest variables and their proposed theoretical constructs. Then this is followed by making a distinction between reflective and formative latent variables to assess the measurement model (Urbach & Ahlemann, 2010). After that, the structural model's exogenous (independent) and endogenous (dependent) constructs are examined.

5.7.1 Stage One: Assessing the Measurement Model

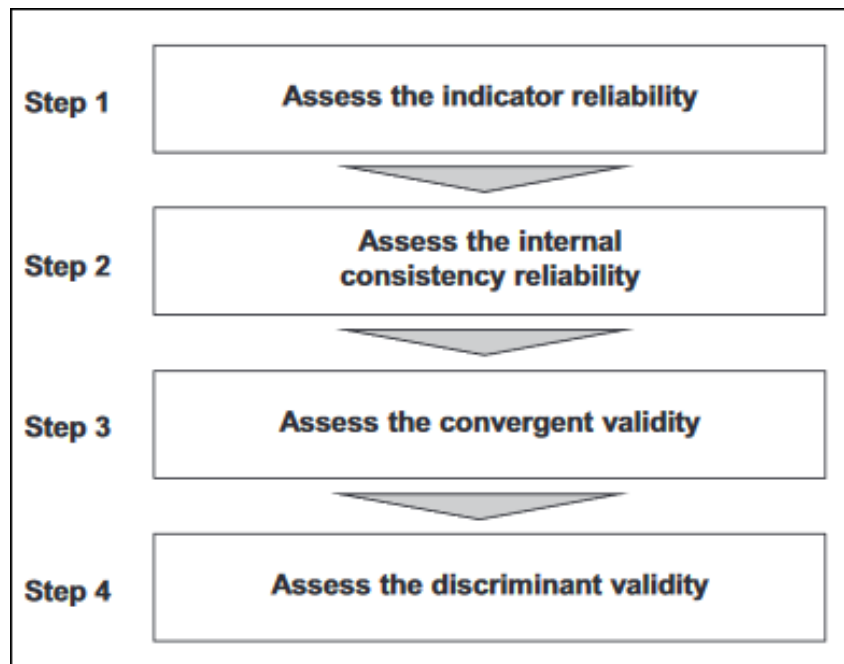
Hair et al. (2014) define the measurement model as “an SEM model that (a) specifies the indicators for each construct, and (b) enables an assessment of the construct validity” (Pg. 609).

Therefore, it aims to specify the measurement items and how they relate to the latent variables and, as indicated above, distinguish between reflective and formative models.

5.7.1.1 Assessment of Reflective Measurement - lower-order constructs

Straub et al. (2004) provide guidelines for evaluating reflective measurement models for internal consistency reliability, indicator reliability, convergent validity, and discriminant validity. According to Sarstedt et al. (2021), assessing reflective measurement models includes examining the reliability of measures, both at the indicator level (indicator reliability) and at the construct level (internal consistency reliability). In addition, the validity assessment focuses on each measure's convergent validity using the AVE. Furthermore, the heterotrait–monotrait (HTMT) ratio of correlations allows assessing a reflectively measured latent variable's (LV) discriminant validity compared to other LV measures in the same model. Figure 9 below shows reflective measurement model assessment steps.

Figure 9: Reflective measurement model assessment steps



Source: Source: Sarstedt et al. (2022)

Indicator Reliability

Indicator reliability is the first step in assessing the reflective measurement model. According to Chin (1998), indicator reliability describes a variable or set of variables to determine if they are

consistent with what they intend to measure. In order to compute an indicator's explained variance, a square of the indicator loading is taken, this being the bivariate correlation between indicator and construct. Therefore, indicator reliability shows the communality of an indicator. Loadings above 0.708 are recommended as significant at least at the .050 level, which means the construct or LV explains more than 50% of the indicator's variance and, therefore, provides acceptable indicator reliability. According to Hulland (1999), low indicator loading (<0.708) is typical for measurement models in social science studies, particularly with newly developed scales. While the recommendation is that indicator loading between 0.40 and 0.7 should be considered for removal, this should be done if it increases internal consistency reliability or convergence validity. However, indicators below 0.40 should be removed from the study. This study removed items with loading that was less than the recommended value of 0.4. Table 20 shows all items with a loading value of > 0.5 , as Hair et al. (2014) recommended. Therefore, this shows a reasonable level of item reliability among the measurement items. For table abbreviations, see Appendix J.

Table 20: Indicator Reliability - Loading and Cross loading

	Perceived Ease of Use of Mobile Phone	Perceived Usefulness of Mobile Phone	Trust	Cost	Perceived Usefulness of M-payments	Perceived Ease of Use of Mobile Payments	Perfection-conscious	Brand-conscious	Novelty-Variety-conscious	Recreational-conscious	Price-conscious	Impulsive	Confused-by-over Choices	Habitual/loyal	Advice-seeking	Advice-seeking	M-commerce Activities
EU1	0.818	0.098	0.016	0.019	-0.040	0.095	0.089	-0.046	0.004	0.05	-0.09	0.047	-0.053	0.054	0.005	0.049	-0.017
EU3	0.856	-0.082	-0.025	-0.012	-0.015	-0.079	-0.065	0.047	-0.011	-0.027	0.08	-0.001	0.036	-0.053	0.005	-0.021	0.029
EU4	0.878	-0.019	0.009	-0.008	0.056	-0.019	-0.026	0.000	0.007	-0.025	0.013	-0.047	0.018	-0.002	-0.01	-0.029	-0.012
U1	0.163	0.661	0.100	-0.004	-0.015	-0.108	0.009	-0.105	0.02	-0.032	0.055	0.075	0.088	0.015	0.045	-0.172	-0.035
U2	-0.062	0.816	-0.039	-0.013	-0.059	0.007	-0.022	0.007	0.017	-0.013	-0.052	0.008	-0.043	0.006	-0.01	0.006	0.080
U3	0.045	0.742	-0.037	0.095	-0.076	0.076	-0.021	0.116	-0.06	0.047	-0.062	-0.067	0.055	-0.053	0.009	-0.013	-0.050
U4	-0.112	0.686	-0.041	0.026	-0.056	0.071	0.003	-0.018	-0.119	0.094	0.062	-0.01	0.047	0.047	0.085	-0.054	-0.191
U5	0.121	0.813	0.021	0.014	0.089	-0.045	-0.059	0.037	0.097	-0.015	-0.038	0.066	-0.026	-0.048	-0.032	0.019	-0.009
U6	-0.148	0.722	-0.002	-0.085	0.069	0.018	0.089	-0.048	-0.02	-0.036	0.065	-0.072	-0.061	0.046	-0.043	0.135	0.097
T3	-0.045	0.043	0.619	0.424	0.103	-0.181	0.033	0.075	-0.061	-0.072	-0.040	0.097	-0.101	0.136	0.132	-0.142	0.078
T1	0.048	-0.047	0.529	-0.459	-0.111	0.195	-0.036	-0.081	0.066	0.078	0.043	-0.105	0.11	-0.147	-0.143	0.154	-0.085
C1	-0.062	0.106	0.028	0.504	0.358	-0.202	-0.03	-0.100	0.088	0.153	-0.062	0.174	0.089	-0.195	-0.077	-0.121	-0.007
C2	0.121	-0.055	-0.085	0.512	0.244	-0.142	0.231	-0.219	-0.054	0.112	-0.142	0.150	0.078	-0.100	-0.061	-0.007	0.014
C5	-0.002	-0.021	0.006	0.950	-0.138	0.079	-0.029	0.063	-0.016	-0.06	0.040	-0.072	-0.037	0.070	0.031	0.035	0.000
UMP1	0.016	-0.036	-0.036	0.003	0.848	-0.101	0.093	-0.089	0.042	0.037	-0.027	0.008	-0.019	0.079	-0.067	0.053	0.009
UMP2	0.058	-0.042	-0.078	-0.072	0.893	-0.002	-0.03	0.094	-0.015	0.003	0.001	-0.071	0.067	0.020	0.031	-0.012	-0.026
UMP3	0.144	-0.114	0.088	0.027	0.814	-0.044	-0.055	-0.027	-0.045	0.045	0.002	0.057	-0.017	-0.040	0.078	-0.116	-0.011
UMP4	-0.207	0.183	0.035	0.044	0.811	0.144	-0.013	0.021	0.014	-0.082	0.025	0.012	-0.033	-0.063	-0.036	0.065	0.027
EUP1	0.076	-0.043	-0.05	-0.026	0.016	0.845	0.121	-0.013	-0.069	0.017	-0.038	0.077	-0.008	0.049	-0.021	0.031	-0.015
EUP2	-0.043	0.059	-0.023	-0.025	-0.045	0.866	-0.036	-0.034	0.023	0.016	0.047	0.014	0.005	-0.085	-0.066	0.064	-0.001
EUP3	0.001	-0.029	0.028	0.027	-0.005	0.888	-0.078	0.041	-0.018	0.003	0.015	-0.064	0.003	0.012	0.049	-0.058	0.040
EUP4	-0.037	0.016	0.046	0.024	0.035	0.866	-0.006	0.004	0.068	-0.038	-0.024	-0.025	0.001	0.022	0.035	-0.034	-0.027
PCC1	0.079	-0.049	0.041	-0.057	0.088	0.038	0.796	-0.123	0.019	0.047	0.067	0.056	0.024	-0.110	-0.081	0.027	-0.076
PCC2	-0.004	-0.025	-0.025	-0.076	-0.03	0.011	0.863	-0.082	-0.071	0.035	-0.003	0.082	0.041	-0.016	0.017	-0.008	-0.025
PCC3	0.003	-0.006	0.029	-0.044	-0.037	-0.027	0.879	-0.021	0.002	-0.047	-0.014	-0.022	0.000	-0.008	0.036	0.027	-0.033
PCC4	0.007	-0.039	-0.022	0.044	-0.072	-0.005	0.849	0.073	0.021	-0.005	-0.013	-0.072	-0.037	-0.012	0.023	0.033	0.049
PCC5	-0.072	0.100	-0.018	0.107	0.041	-0.015	0.773	0.123	0.023	-0.027	-0.032	-0.035	-0.021	0.123	0.006	-0.066	0.068
BCC1	-0.014	0.011	-0.048	-0.024	0.053	0.028	0.179	0.899	-0.048	0.01	-0.008	0.006	-0.008	0.015	-0.035	0.007	-0.026
BCC5	0.006	-0.059	0.074	0.021	-0.004	-0.028	-0.148	0.819	0.040	-0.015	-0.007	-0.021	-0.023	-0.065	0.035	0.037	0.038
BCC6	0.049	0.149	-0.015	0.048	-0.261	-0.043	-0.4	0.487	0.105	0.003	0.067	0.04	0.123	0.152	0.059	-0.165	0.002

	Perceived Ease of Use of Mobile Phone	Perceived Usefulness of Mobile Phone	Trust	Cost	Perceived Usefulness of M-payments	Perceived Ease of Use of Mobile Payments	Perfection-conscious	Brand-conscious	Novelty-Variety-conscious	Recreational-conscious	Price-conscious	Impulsive	Confused-by-over Choices	Habitual/loyal	Advice-seeking	Advice-seeking	M-commerce Activities
NVC1	-0.057	0.095	0.002	-0.024	0.043	-0.093	-0.196	0.162	0.683	-0.147	-0.076	0.028	0.040	-0.003	0.108	-0.076	-0.069
NVC2	-0.054	0.111	0.064	0.006	0.011	-0.008	-0.281	0.247	0.718	-0.021	-0.034	-0.037	0.083	-0.026	-0.019	-0.092	-0.059
NVC3	-0.050	-0.058	0.079	0.003	-0.054	0.098	-0.065	0.027	0.819	-0.011	0.051	-0.089	0.023	-0.063	-0.022	0.009	0.107
NVC4	0.139	-0.063	-0.054	0.079	0.027	0.018	0.146	-0.178	0.792	-0.108	-0.055	0.075	-0.117	0.087	-0.011	-0.027	-0.003
NVC5	-0.043	0.026	-0.084	-0.101	0.002	-0.094	0.221	-0.075	0.658	0.283	0.079	0.029	0.043	-0.010	-0.015	0.142	-0.060
RSC1	-0.087	0.003	0.228	-0.163	0.136	0.029	0.240	-0.200	-0.172	0.420	-0.009	-0.028	-0.133	-0.167	0.128	-0.101	-0.079
RSC2	0.008	-0.035	-0.039	0.026	0.043	0.007	-0.031	0.022	0.041	0.965	-0.019	0.017	-0.042	0.005	-0.054	0.044	0.026
RSC4	0.049	0.123	-0.058	0.048	-0.276	-0.051	-0.099	0.094	0.001	0.546	0.077	-0.038	0.271	0.129	0.086	-0.071	-0.026
PCD1	0.039	-0.120	-0.012	0.082	-0.139	0.024	-0.217	0.184	0.162	-0.011	0.757	-0.213	0.080	-0.086	0.048	-0.098	0.163
PCD3	-0.038	0.119	0.011	-0.081	0.138	-0.024	0.216	-0.183	-0.161	0.011	0.761	0.211	-0.079	0.085	-0.047	0.098	-0.162
ICC1	0.122	-0.029	-0.015	-0.082	0.114	-0.115	0.061	-0.004	-0.097	0.123	0.031	0.856	0.042	-0.191	-0.062	0.057	-0.021
ICC4	-0.110	0.142	0.091	0.060	-0.285	0.030	-0.126	0.121	0.177	-0.324	0.019	0.440	0.141	0.367	0.017	-0.137	0.079
ICC5	-0.124	-0.074	-0.053	0.095	0.045	0.181	0.002	-0.100	0.019	0.065	-0.073	0.605	-0.202	0.021	0.098	0.019	-0.033
COC1	0.021	-0.068	0.067	0.003	0.002	-0.168	0.023	0.049	-0.112	0.043	0.17	0.083	0.637	-0.093	0.066	0.146	-0.045
COC2	-0.155	0.046	-0.007	-0.085	-0.038	0.025	-0.070	0.034	0.100	-0.027	0.137	0.057	0.712	-0.032	-0.028	0.085	-0.040
COC3	0.139	-0.120	-0.031	0.066	0.075	0.027	0.036	0.027	-0.058	0.040	-0.156	-0.011	0.846	0.011	-0.006	-0.058	0.05
COC4	-0.071	0.170	0.019	-0.019	-0.076	0.023	0.000	-0.097	0.050	-0.055	0.015	-0.079	0.785	0.061	0.001	-0.069	-0.013
HLC1	-0.042	0.026	0.03	-0.032	0.067	0.090	0.016	0.059	0.159	-0.015	-0.112	0.007	-0.112	0.753	-0.067	0.04	-0.096
HLC2	0.023	-0.037	0.015	0.010	0.033	-0.046	0.091	-0.134	-0.020	-0.001	0.045	-0.044	-0.002	0.875	-0.026	-0.001	0.044
HLC3	0.018	0.034	-0.076	0.029	-0.169	-0.044	-0.208	0.181	-0.202	0.026	0.08	0.079	0.176	0.511	0.156	-0.058	0.057
GET1	-0.002	-0.114	-0.083	-0.054	-0.031	0.104	0.073	0.044	-0.021	0.025	-0.015	0.027	-0.068	-0.063	0.832	-0.056	0.091
GET3	0.115	0.060	0.072	0.111	0.024	-0.132	-0.087	-0.092	0.025	-0.088	0.043	-0.060	0.091	-0.017	0.625	0.123	-0.037
GET4	-0.094	0.108	0.055	-0.018	0.023	-0.033	-0.028	0.016	0.008	0.039	-0.015	0.013	0.019	0.102	0.803	-0.025	-0.096
GIV1	0.114	-0.065	0.062	0.133	-0.150	0.079	0.090	-0.097	-0.053	0.062	0.068	-0.001	-0.113	0.096	0.040	0.685	-0.063
GIV2	0.108	-0.016	-0.029	0.013	0.071	0.012	-0.004	0.005	-0.091	0.074	-0.03	0.091	-0.027	-0.001	-0.158	0.801	-0.037
GIV4	-0.204	0.069	-0.019	-0.119	0.042	-0.075	-0.066	0.071	0.138	-0.127	-0.022	-0.096	0.117	-0.074	0.137	0.708	0.088
CD	-0.037	0.001	-0.021	0.057	0.025	-0.012	0.105	-0.124	0.101	-0.061	-0.088	-0.071	-0.085	0.041	0.061	0.051	0.819
TX	-0.029	0.039	0.042	-0.066	0.070	0.041	-0.037	0.087	-0.157	0.067	0.058	0.059	0.057	-0.013	-0.155	-0.038	0.827
BE	0.153	-0.096	-0.052	0.026	-0.225	-0.072	-0.153	0.076	0.146	-0.020	0.062	0.021	0.057	-0.064	0.232	-0.024	0.554

Notes: Loadings are unrotated, and cross-loadings are oblique-rotated. SEs and P values are for loadings. P values < 0.05 are desirable for reflective indicators.

Internal Consistency Reliability

The second step in the reflective measurement model assessment is assessing internal consistency reliability. Internal consistency reliability measures to what extent indicators measuring the same construct are associated with each other. Cronbach's alpha traditionally has been used to assess internal consistency reliability. However, composite reliability (CR) is an alternative measure to Cronbach's alpha, and Chin (1998) recommends it as a measure since it overcomes Cronbach's alpha shortcoming. According to Urbach and Ahlemann (2010), Cronbach's alpha assumes that all indicators have equal reliability and hence tends to underestimate the internal consistency reliability of constructs in PLS-SEM models.

On the other hand, CR considers that indicators have different loadings. Composite reliability (CR) is one of the primary measures in PLS-SEM. Nonetheless, for exploratory studies, values between 0.60 and 0.700 are acceptable, while values between 0.70 and 0.90 are considered satisfactory to good. When values are greater than 0.90, they are considered problematic - signifying that the indicators are redundant with a potential common method bias (CMB), thus having the potential to reduce construct validity. In this study, Composite reliability ranged between 0.710 to 0.923 except for the Trust construct with 0.496. Table 21 presents results for Cronbach alpha and composite reliability for the study.

Table 21: Internal Consistency Reliability - Composite reliability & Cronbach's alpha coefficients

	Composite reliability coefficients	Cronbach's alpha coefficients
Ease of Use of Mobile Phone	0.887	0.809
Usefulness of Mobile Phone	0.880	0.838
Trust	0.496	-1.027
Cost	0.710	0.611
Usefulness of Mobile Payments	0.907	0.863
Ease of Use of Mobile Payments	0.923	0.889
Perfection-consciousness	0.919	0.889
Brand-consciousness	0.791	0.668
Novelty-variety Consciousness	0.855	0.795
Recreational-consciousness	0.776	0.565
Price-consciousness	0.731	0.264
Impulsive-consciousness	0.765	0.432
Confused-by-over choices	0.835	0.754
Habitual/loyalty -consciousness	0.765	0.548
Advice-seeking	0.778	0.635
Advice-giving	0.776	0.571
M-commerce Activities	0.783	0.612

Indicator Multicollinearity

Kock (2011) defines the variance inflation factor (VIF) as “a measure of the degree of multicollinearity among the LVs [latent variables] that are hypothesized to affect another LV” (Pg. 14). According to Kock (2011), high variance inflation factors occur for pairs of latent predictor variables that measure the same thing, hence calling for their removal from the model. The VIF in the present study was assessed for the sixteen (16) predictor variables pointing to latent variable M-commerce activities. VIF calculated for the predictor variables are estimates of the multicollinearity among the predictor latent variables. More conservatively, researchers have recommended that the VIF values be lower than 5.0 or a more relaxed criterion lower than 10 (Knock, 2011; Hair et al., 2007; Kline, 1998). As shown in Table 22 below, the VIFs were all lower than 5.0, indicating low collinearity among predictor variables.

Table 22: Indicator Multicollinearity - Variance Inflation Factors (VIF)

Exogenous Variables	VIF
Ease of Use of Mobile Phone	2.061
Usefulness of Mobile Phone	1.966
Trust	1.073
Cost	1.158
Usefulness of Mobile Payments	2.007
Ease of Use of Mobile Payments	1.798
Perfection-consciousness	1.51
Brand-consciousness	1.409
Novelty-variety Consciousness	1.798
Recreational-consciousness	1.381
Price-consciousness	1.367
Impulsive-consciousness	1.207
Confused-by-over choices	1.187
Habitual/loyalty -consciousness	1.325
Advice-seeking	1.367
Advice-giving	1.387

Convergent Validity

Assessment of convergent validity is the third step in evaluating the quality of reflective measurement model estimates in PLS-SEM. Convergent validity refers to the closeness with which a measure relates to (or converges on) the construct it purports to measure (Bhattacharjee, 2012). The average variance extracted (AVE) is a commonly applied convergent validity

criterion proposed by Fornell and Larcker (1981). An AVE value of at least 0.500 indicates that a construct can, on average, explain more than half of the variance of its indicators and, thus, demonstrates sufficient convergent validity. Thus, the AVE measures the variance captured by the indicators relative to measurement error (Barclay et al., 1995). The AVEs' in this study were within the 0.473 (rounds to 0.5) and 0.750 range except for the Trust latent variable with 0.331. Therefore, those above 0.5 showed adequate measurement model convergence validity for this study (Hair et al., 2014; Fornell & Larcker, 1981; Nunnally, 1994). Table 23 shows the results of the average variance extracted.

Table 23: Convergent Validity – Average variance extracted (AVE)

	AVE
Ease of Use of Mobile Phone	0.725
Usefulness of Mobile Phone	0.551
Trust	0.331
Cost	0.473
Usefulness of Mobile Payments	0.709
Ease of Use of Mobile Payments	0.750
Perfection-consciousness	0.694
Brand-consciousness	0.571
Novelty-variety Consciousness	0.542
Recreational-consciousness	0.648
Price-consciousness	0.576
Impulsive-consciousness	0.625
Confused-by-over choices	0.561
Habitual/loyalty -consciousness	0.531
Advice-seeking	0.476
Advice-giving	0.538
M-commerce Activities	0.554

Discriminant Validity

Discriminant validity assessment is the fourth step in evaluating the quality of reflective measurement model estimates in PLS-SEM. Discriminant validity refers to how a measure does not measure (or discriminates from) other constructs that it is not supposed to measure. According to Henseler (2015), two popular approaches used to evaluate discriminant validity are the FornellLarcker criterion and cross-loading examination. In this study, discriminant validity

was assessed on the study data. According to Hair et al. (2014) and Kock (2015), the diagonal values (AVE's square roots) must be greater than the values in the matching row and column.

Discriminant Validity - FornellLarcker criterion

To assess discriminate validity, the squares of AVE for the construct should be greater than its correlation with all the other constructs (Fornell & Larcker, 1981). For any latent variable, the variance shared with its block of indicators is greater than the variance it shares with any other latent variable. The square root of AVE in this study, as shown in Table 24, the square root of AVE for constructs was found to be greater than the correlation with other constructs and therefore establishing a strong discriminant validity.

Table 24: Discriminant Validity for the Measurement Constructs

Correlations among I.vs. with sq. rts. of AVEs

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Ease of Use of Mobile Phone	0.851															
2. Usefulness of Mobile Phone	0.664	0.742														
3. Trust	0.089	0.081	0.576													
4. Cost	-0.224	-0.188	-0.111	0.688												
5. Usefulness of Mobile Payments	0.453	0.429	0.078	-0.145	0.842											
6. Ease of Use of Mobile Payments	0.490	0.451	0.086	-0.173	0.578	0.866										
7. Perfection-consciousness	0.261	0.263	0.143	-0.105	0.403	0.34	0.833									
8. Brand-consciousness	0.163	0.14	0.042	-0.022	0.271	0.257	0.437	0.756								
9. Novelty-variety Consciousness	0.249	0.222	0.052	-0.057	0.286	0.282	0.4	0.424	0.736							
10. Recreational-consciousness	0.126	0.093	0.028	-0.007	0.135	0.165	0.175	0.223	0.491	0.805						
11. Price-consciousness	0.265	0.237	0.022	-0.009	0.375	0.323	0.218	0.251	0.339	0.21	0.759					
12. Impulsive-consciousness	0.166	0.131	0.041	0.054	0.294	0.23	0.128	0.223	0.22	0.098	0.265	0.791				
13. Confused-by-over choices	0.009	-0.021	0.024	0.212	0.140	0.036	0.014	0.031	0.136	0.152	-0.004	0.075	0.749			
14. Habitual/loyalty - consciousness	0.229	0.207	-0.017	-0.029	0.334	0.31	0.226	0.194	0.293	0.278	0.301	0.053	0.167	0.729		
15. Advice-seeking	0.179	0.211	0.104	0.031	0.317	0.269	0.186	0.17	0.279	0.098	0.24	0.227	0.204	0.127	0.690	
16. Advice-giving	0.264	0.256	0.191	-0.041	0.371	0.318	0.216	0.153	0.197	0.087	0.233	0.199	0.138	0.239	0.405	0.733

Note: Square roots of average variances extracted (AVEs) are shown on diagonal.

Discriminant Validity - Cross-loadings

Gefen and Straub (2005) indicate that “discriminant validity is shown when each measurement item correlates weakly with another construct except with the ones to which it is theoretically associated.” According to Henseler et al. (2015), discriminant validity is established if there is a high correlation between items of the same construct and a very weak correlation with items of a different construct. Chin (1998) notes that item loadings are higher when going down a particular construct column than the cross-loadings. Therefore, while scanning a particular item row, items are expected to be more strongly related to its construct column than any other. That being the case, a discriminant validity at the item level is established. Table 25 below shows that each item loads more highly on their own construct than on other constructs and that all constructs share more variance with their measures than with other constructs; hence discriminant validity is established. For table abbreviations, see Appendix J.

Table 25: Discriminant Validity –Loading and Cross Loading

	Perceived Ease of Use of Mobile Phone	Perceived Usefulness of Mobile Phone	Trust	Cost	Perceived Usefulness of M-payments	Perceived Ease of Use of Mobile Payments	Perfection-conscious	Brand-conscious	Novelty-Variety-conscious	Recreational-conscious	Price-conscious	Impulsive	Confused-by-over Choices	Habitual/loyal	Advice-seeking	Advice-seeking	M-commerce Activities
EU1	0.818	0.098	0.016	0.019	-0.040	0.095	0.089	-0.046	0.004	0.050	-0.090	0.047	-0.053	0.054	0.005	0.049	-0.017
EU3	0.856	-0.082	-0.025	-0.012	-0.015	-0.079	-0.065	0.047	-0.011	-0.027	0.080	-0.001	0.036	-0.053	0.005	-0.021	0.029
EU4	0.878	-0.019	0.009	-0.008	0.056	-0.019	-0.026	0.000	0.007	-0.025	0.013	-0.047	0.018	-0.002	-0.010	-0.029	-0.012
U1	0.163	0.661	0.100	-0.004	-0.015	-0.108	0.009	-0.105	0.020	-0.032	0.055	0.075	0.088	0.015	0.045	-0.172	-0.035
U2	-0.062	0.816	-0.039	-0.013	-0.059	0.007	-0.022	0.007	0.017	-0.013	-0.052	0.008	-0.043	0.006	-0.010	0.006	0.080
U3	0.045	0.742	-0.037	0.095	-0.076	0.076	-0.021	0.116	-0.060	0.047	-0.062	-0.067	0.055	-0.053	0.009	-0.013	-0.050
U4	-0.112	0.686	-0.041	0.026	-0.056	0.071	0.003	-0.018	-0.119	0.094	0.062	-0.010	0.047	0.047	0.085	-0.054	-0.191
U5	0.121	0.813	0.021	0.014	0.089	-0.045	-0.059	0.037	0.097	-0.015	-0.038	0.066	-0.026	-0.048	-0.032	0.019	-0.009
U6	-0.148	0.722	-0.002	-0.085	0.069	0.018	0.089	-0.048	-0.020	-0.036	0.065	-0.072	-0.061	0.046	-0.043	0.135	0.097
T3	-0.045	0.043	0.619	0.424	0.103	-0.181	0.033	0.075	-0.061	-0.072	-0.040	0.097	-0.101	0.136	0.132	-0.142	0.078
T1	0.048	-0.047	0.529	-0.459	-0.111	0.195	-0.036	-0.081	0.066	0.078	0.043	-0.105	0.110	-0.147	-0.143	0.154	-0.085
C1	-0.062	0.106	0.028	0.504	0.358	-0.202	-0.030	-0.100	0.088	0.153	-0.062	0.174	0.089	-0.195	-0.077	-0.121	-0.007
C2	0.121	-0.055	-0.085	0.512	0.244	-0.142	0.231	-0.219	-0.054	0.112	-0.142	0.150	0.078	-0.100	-0.061	-0.007	0.014

	Perceived Ease of Use of Mobile Phone	Perceived Usefulness of Mobile Phone	Trust	Cost	Perceived Usefulness of M-payments	Perceived Ease of Use of Mobile Payments	Perfection-conscious	Brand-conscious	Novelty-Variety-conscious	Recreational-conscious	Price-conscious	Impulsive	Confused-by-over Choices	Habitual/loyal	Advice-seeking	Advice-seeking	M-commerce Activities
C5	-0.002	-0.021	0.006	0.950	-0.138	0.079	-0.029	0.063	-0.016	-0.060	0.040	-0.072	-0.037	0.070	0.031	0.035	0.000
UMP1	0.016	-0.036	-0.036	0.003	0.848	-0.101	0.093	-0.089	0.042	0.037	-0.027	0.008	-0.019	0.079	-0.067	0.053	0.009
UMP2	0.058	-0.042	-0.078	-0.072	0.893	-0.002	-0.03	0.094	-0.015	0.003	0.001	-0.071	0.067	0.020	0.031	-0.012	-0.026
UMP3	0.144	-0.114	0.088	0.027	0.814	-0.044	-0.055	-0.027	-0.045	0.045	0.002	0.057	-0.017	-0.040	0.078	-0.116	-0.011
UMP4	-0.207	0.183	0.035	0.044	0.811	0.144	-0.013	0.021	0.014	-0.082	0.025	0.012	-0.033	-0.063	-0.036	0.065	0.027
EUP1	0.076	-0.043	-0.050	-0.026	0.016	0.845	0.121	-0.013	-0.069	0.017	-0.038	0.077	-0.008	0.049	-0.021	0.031	-0.015
EUP2	-0.043	0.059	-0.023	-0.025	-0.045	0.866	-0.036	-0.034	0.023	0.016	0.047	0.014	0.005	-0.085	-0.066	0.064	-0.001
EUP3	0.001	-0.029	0.028	0.027	-0.005	0.888	-0.078	0.041	-0.018	0.003	0.015	-0.064	0.003	0.012	0.049	-0.058	0.040
EUP4	-0.037	0.016	0.046	0.024	0.035	0.866	-0.006	0.004	0.068	-0.038	-0.024	-0.025	0.001	0.022	0.035	-0.034	-0.027
PCC1	0.079	-0.049	0.041	-0.057	0.088	0.038	0.796	-0.123	0.019	0.047	0.067	0.056	0.024	-0.110	-0.081	0.027	-0.076
PCC2	-0.004	-0.025	-0.025	-0.076	-0.030	0.011	0.863	-0.082	-0.071	0.035	-0.003	0.082	0.041	-0.016	0.017	-0.008	-0.025
PCC3	0.003	-0.006	0.029	-0.044	-0.037	-0.027	0.879	-0.021	0.002	-0.047	-0.014	-0.022	0.000	-0.008	0.036	0.027	-0.033
PCC4	0.007	-0.039	-0.022	0.044	-0.072	-0.005	0.849	0.073	0.021	-0.005	-0.013	-0.072	-0.037	-0.012	0.023	0.033	0.049
PCC5	-0.072	0.100	-0.018	0.107	0.041	-0.015	0.773	0.123	0.023	-0.027	-0.032	-0.035	-0.021	0.123	0.006	-0.066	0.068
BCC1	-0.014	0.011	-0.048	-0.024	0.053	0.028	0.179	0.899	-0.048	0.010	-0.008	0.006	-0.008	0.015	-0.035	0.007	-0.026
BCC5	0.006	-0.059	0.074	0.021	-0.004	-0.028	-0.148	0.819	0.040	-0.015	-0.007	-0.021	-0.023	-0.065	0.035	0.037	0.038
BCC6	0.049	0.149	-0.015	0.048	-0.261	-0.043	-0.400	0.487	0.105	0.003	0.067	0.040	0.123	0.152	0.059	-0.165	0.002
NVC1	-0.057	0.095	0.002	-0.024	0.043	-0.093	-0.196	0.162	0.683	-0.147	-0.076	0.028	0.040	-0.003	0.108	-0.076	-0.069
NVC2	-0.054	0.111	0.064	0.006	0.011	-0.008	-0.281	0.247	0.718	-0.021	-0.034	-0.037	0.083	-0.026	-0.019	-0.092	-0.059
NVC3	-0.050	-0.058	0.079	0.003	-0.054	0.098	-0.065	0.027	0.819	-0.011	0.051	-0.089	0.023	-0.063	-0.022	0.009	0.107
NVC4	0.139	-0.063	-0.054	0.079	0.027	0.018	0.146	-0.178	0.792	-0.108	-0.055	0.075	-0.117	0.087	-0.011	-0.027	-0.003
NVC5	-0.043	0.026	-0.084	-0.101	0.002	-0.094	0.221	-0.075	0.658	0.283	0.079	0.029	0.043	-0.010	-0.015	0.142	-0.060
RSC1	-0.087	0.003	0.228	-0.163	0.136	0.029	0.240	-0.200	-0.172	0.420	-0.009	-0.028	-0.133	-0.167	0.128	-0.101	-0.079
RSC2	0.008	-0.035	-0.039	0.026	0.043	0.007	-0.031	0.022	0.041	0.965	-0.019	0.017	-0.042	0.005	-0.054	0.044	0.026
RSC4	0.049	0.123	-0.058	0.048	-0.276	-0.051	-0.099	0.094	0.001	0.546	0.077	-0.038	0.271	0.129	0.086	-0.071	-0.026
PCD1	0.039	-0.120	-0.012	0.082	-0.139	0.024	-0.217	0.184	0.162	-0.011	0.757	-0.213	0.080	-0.086	0.048	-0.098	0.163
PCD3	-0.038	0.119	0.011	-0.081	0.138	-0.024	0.216	-0.183	-0.161	0.011	0.761	0.211	-0.079	0.085	-0.047	0.098	-0.162
ICC1	0.122	-0.029	-0.015	-0.082	0.114	-0.115	0.061	-0.004	-0.097	0.123	0.031	0.856	0.042	-0.191	-0.062	0.057	-0.021

	Perceived Ease of Use of Mobile Phone	Perceived Usefulness of Mobile Phone	Trust	Cost	Perceived Usefulness of M-payments	Perceived Ease of Use of Mobile Payments	Perfection-conscious	Brand-conscious	Novelty-Variety-conscious	Recreational-conscious	Price-conscious	Impulsive	Confused-by-over Choices	Habitual/loyal	Advice-seeking	Advice-seeking	M-commerce Activities
ICC4	-0.110	0.142	0.091	0.060	-0.285	0.030	-0.126	0.121	0.177	-0.324	0.019	0.440	0.141	0.367	0.017	-0.137	0.079
ICC5	-0.124	-0.074	-0.053	0.095	0.045	0.181	0.002	-0.100	0.019	0.065	-0.073	0.605	-0.202	0.021	0.098	0.019	-0.033
COC1	0.021	-0.068	0.067	0.003	0.002	-0.168	0.023	0.049	-0.112	0.043	0.170	0.083	0.637	-0.093	0.066	0.146	-0.045
COC2	-0.155	0.046	-0.007	-0.085	-0.038	0.025	-0.070	0.034	0.100	-0.027	0.137	0.057	0.712	-0.032	-0.028	0.085	-0.040
COC3	0.139	-0.120	-0.031	0.066	0.075	0.027	0.036	0.027	-0.058	0.040	-0.156	-0.011	0.846	0.011	-0.006	-0.058	0.050
COC4	-0.071	0.170	0.019	-0.019	-0.076	0.023	0.000	-0.097	0.05	-0.055	0.015	-0.079	0.785	0.061	0.001	-0.069	-0.013
HLC1	-0.042	0.026	0.03	-0.032	0.067	0.090	0.016	0.059	0.159	-0.015	-0.112	0.007	-0.112	0.753	-0.067	0.040	-0.096
HLC2	0.023	-0.037	0.015	0.010	0.033	-0.046	0.091	-0.134	-0.020	-0.001	0.045	-0.044	-0.002	0.875	-0.026	-0.001	0.044
HLC3	0.018	0.034	-0.076	0.029	-0.169	-0.044	-0.208	0.181	-0.202	0.026	0.080	0.079	0.176	0.511	0.156	-0.058	0.057
GET1	-0.002	-0.114	-0.083	-0.054	-0.031	0.104	0.073	0.044	-0.021	0.025	-0.015	0.027	-0.068	-0.063	0.832	-0.056	0.091
GET3	0.115	0.060	0.072	0.111	0.024	-0.132	-0.087	-0.092	0.025	-0.088	0.043	-0.060	0.091	-0.017	0.625	0.123	-0.037
GET4	-0.094	0.108	0.055	-0.018	0.023	-0.033	-0.028	0.016	0.008	0.039	-0.015	0.013	0.019	0.102	0.803	-0.025	-0.096
GIV1	0.114	-0.065	0.062	0.133	-0.150	0.079	0.090	-0.097	-0.053	0.062	0.068	-0.001	-0.113	0.096	0.040	0.685	-0.063
GIV2	0.108	-0.016	-0.029	0.013	0.071	0.012	-0.004	0.005	-0.091	0.074	-0.030	0.091	-0.027	-0.001	-0.158	0.801	-0.037
GIV4	-0.204	0.069	-0.019	-0.119	0.042	-0.075	-0.066	0.071	0.138	-0.127	-0.022	-0.096	0.117	-0.074	0.137	0.708	0.088
CD	-0.037	0.001	-0.021	0.057	0.025	-0.012	0.105	-0.124	0.101	-0.061	-0.088	-0.071	-0.085	0.041	0.061	0.051	0.819
TX	-0.029	0.039	0.042	-0.066	0.070	0.041	-0.037	0.087	-0.157	0.067	0.058	0.059	0.057	-0.013	-0.155	-0.038	0.827
BE	0.153	-0.096	-0.052	0.026	-0.225	-0.072	-0.153	0.076	0.146	-0.020	0.062	0.021	0.057	-0.064	0.232	-0.024	0.554

Notes: Loadings are unrotated and cross-loadings are oblique-rotated. SEs and P values are for loadings. P values < 0.05 are desirable for reflective indicators.

Discriminant Validity - Heterotrait-monotrait ratio of correlations (HTMT)

Hair et al. (2019) posit that the Heterotrait-monotrait ratio of correlations (HTMT) is a new approach for assessing discriminant validity. This was introduced by Henseler et al. (2015). Hair et al. (2019) further indicate that the Fornell Larcker criterion does not work well when the item loadings on a latent variable differ even by a small margin (e.g., item loadings are between 0.65 and 0.85). Therefore, HTMT ratios are a replacement. Hair et al. (2019) define HTMT as "the mean value of the item correlations across constructs relative to the (geometric) mean of the average correlations for the items measuring the same construct." If HTMT values are > 0.90 , there are discriminant validity problems, which happens when structural models with constructs are conceptually very similar. In this study data, the HTMT ratios were less than 0.85 except for one latent variable, Impulsive-Consciousness. Hence, confirming discriminant validity was established for the other variables.

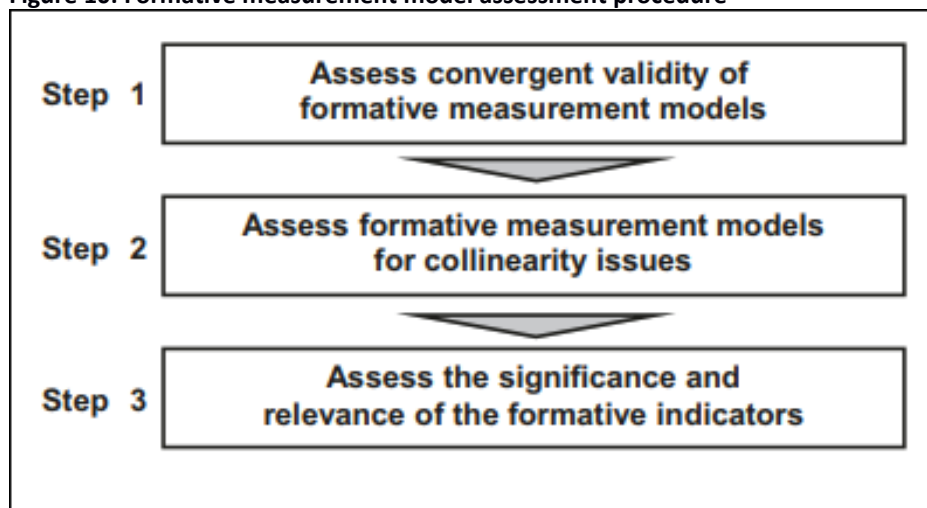
Table 26: Discriminant Validity – Heterotrait – Monotrait Ratio (HTMT)

HTMT ratios (good if < 0.90 , best if < 0.85)																
	1	2	3	4	5	6	7	8	9	10	11	12	D_COC	D_HLC	E_GET	E_GIV
1. Ease of Use of Mobile Phone																
2. Usefulness of Mobile Phone	0.800															
3. Trust	0.132	0.103														
4. Cost	0.246	0.201	0.562													
5. Usefulness of Mobile Payments	0.541	0.491	0.095	0.159												
6. Ease of Use of Mobile Payments	0.577	0.517	0.157	0.233	0.659											
7. Perfection-conscious	0.306	0.293	0.153	0.133	0.455	0.381										
8. Brand-consciousness	0.191	0.169	0.119	0.140	0.293	0.264	0.456									
9. Novelty-variety Conscious	0.290	0.254	0.089	0.134	0.328	0.310	0.443	0.611								
10. Recreational-consciousness	0.181	0.168	0.203	0.221	0.212	0.231	0.311	0.424	0.71							
11. Price-consciousness	0.574	0.499	0.116	0.217	0.784	0.667	0.453	0.641	0.717	0.585						
12. Impulsive-consciousness	0.241	0.257	0.312	0.359	0.461	0.422	0.228	0.568	0.498	0.433	0.921					
13. Confused-by-over choices	0.050	0.089	0.098	0.399	0.165	0.074	0.039	0.153	0.200	0.349	0.213	0.346				
14. Habitual/loyalty -consciousness	0.322	0.291	0.129	0.157	0.456	0.426	0.348	0.360	0.413	0.523	0.781	0.413	0.288			
15. Advice-seeking	0.260	0.297	0.168	0.082	0.429	0.340	0.239	0.248	0.383	0.236	0.560	0.483	0.322	0.224		
16. Advice-giving	0.389	0.351	0.254	0.096	0.517	0.449	0.307	0.235	0.276	0.134	0.610	0.410	0.235	0.424	0.712	

5.7.1.2 Assessment of Formative Measurement - Validating Higher-Order Construct

According to Hair et al. (2019), when formative constructs are included in a PLS path model, PLS-SEM is the preferred approach for assessment. Figure 10 outlines steps used to evaluate formatively specified constructs, and this includes assessment of convergent validity, indicator collinearity, statistical significance, and indicator weights relevance.

Figure 10: Formative measurement model assessment procedure



Source: Sarstedt et al. (2022)

M-commerce activities in the study is a higher-order formative construct based on three lower-order (LOC) constructs Content Delivery, Transactions, and Entertainment. M-commerce activities in this study model were defined as a formative latent variable with content delivery, transaction, and entertainment measuring different facets of the M-commerce activities, and therefore they should be non-redundant.

In order to establish the M-commerce activities, higher-order construct (HOC) validity, Outer Weights, Outer Loadings, and VIF were assessed. The outer weights were significant (Hair et al., 2019). Furthermore, outer Loadings and VIF were found to be > 0.50 for each of the lower order constructs (Sarstedt et al., 2019). According to Kock (2022) and Petter et al. (2007), the VIF threshold of 3.3 has been recommended in PLS-based SEM when discussing formative latent variable measurements with a conservative capping at 2.5 for indicators used in formative measurement, leading to improved estimate stability. More conservatively, it is recommended that VIFs be lower than 5 (Hair et al., 2017). The analysis provided indicator weight loading

signs (WLS) for all latent variables. A negative WLS for an indicator means that it contributes negatively to the R^2 and according to Kock (2015), this suggests the existence of a Simpson's paradox instance. Since all criteria were met, the HOC validity was established.

Table 27: Higher order construct validity

HOC	LOC	Outer Weight	P Values	Outer Loadings	VIF	WLS	ESS
M-commerce Activities	Content Delivery	0.521	<0.001	0.820	1.280	1	0.427
	Transaction	0.541	<0.001	0.826	1.254	1	0.446
	Entertainment	0.228	<0.001	0.554	1.156	1	0.126

Measurement Model Review (Stage One)

Observed measurement items (variables) examined the model's constructs in stage one. In order to assess reflective latent variables' reliability and validity, individual item, convergent, and discriminant validity were examined. Convergent validity was also examined, and the values exceeded the levels recommended - Composite reliability, 0.70, except for one construct Trust with Composite reliability of 0.496. Finally, the square root of AVE - Fornell Larcker, construct loading and cross-loading, and HTMT ratios were used to examine discriminant validity. The findings showed that the measurement model factors were empirically distinguishable, as shown in Table 26. Finally, formative latent variables were also assessed for convergent validity, indicator collinearity, statistical significance, and relevance of the indicator weights. Results are presented in Table 27. Therefore, the above results were satisfactory for study model reliability and validity. Therefore, stage two (2) examines the structural model assessment to determine the study's model predictive power.

5.7.2 Stage Two: Structural Model Assessment

Evaluation of the structural model involves examining the model's predictive capabilities and the relationship between constructs (Hair et al., 2014). Urbach and Ahlemann (2010) give four different considerations when assessing a PLS model's structural level. First, the principal criteria for assessing the structural model in PLS-SEM are the path coefficients (β) significance amongst the latent variables (LVs'). In addition, according to Huber et al. (2007), as cited by Urbach and Ahlemann (2010), the path coefficient direction and degree are also considered. Second, the effect size (f^2) measures whether the independent latent variable substantially

impacts the latent dependent variable. Values of .020, .150, and .350 indicate the predictor variable's low, medium, or significant effect in the structural model (Cohen, 1988; Chin 1998b). Third, the predictive relevance (Q^2) – measures the predictive relevance of a block of manifest variables. A higher Q^2 means that the model's predictive relevance is high, and modifications to a model may be evaluated by comparing the Q^2 values. The proposed threshold value is $Q^2 > 0$ (Hair et al., 2019; Urbach & Ahlemann, 2010). Finally, the coefficient of determination (R^2) - attempts to measure the explained variance of an LV relative to its total variance. According to Chin (1998), values about 0.670, 0.333, and 0.190 are considered substantial, moderate, and weak, respectively.

This study's conceptual model presented in Figure 11 was subjected to path analysis with WarpPLS. SEM package, WarpPLS 8.0, has several linear and non-linear algorithms for analyzing structural models, specifically nonlinear relationships among variables of a theorized model (Kock, 2013). The causal structure of the model was examined by estimating the model's path coefficient (β), the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). Table 28 shows the hypotheses for this study, where sixteen (16) causal paths were presented.

Table 28: Proposed Hypotheses for this study

Study Hypotheses
Hypothesis 1: The perceived ease-of-use of the mobile phone positively influences the adoption of m-commerce activities.
Hypothesis 2: The perceived usefulness of the mobile phone positively influences the adoption of m-commerce activities.
Hypothesis 3: The perceived high cost of mobile technology negatively influences the adoption of m-commerce activities.
Hypothesis 4: The perceived trust of mobile technology positively influences the adoption of m-commerce activities.
Hypothesis 5: The perceived ease-of-use of m-payments positively influences the adoption of m-commerce activities.
Hypothesis 6: The perceived usefulness of m-payments positively influences the adoption of m-commerce activities.
Hypothesis 7: Perfection-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.
Hypothesis 8: Brand-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.
Hypothesis 9: Novelty-variety-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.
Hypothesis 10: Recreational-consciousness of mobile-phone users toward shopping positively influences the adoption of m-commerce activities.
Hypothesis 11: Price-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Hypothesis 12: Impulsiveness shopping of a mobile-phone user positively influences the adoption of m-commerce activities.

Hypothesis 13: Confused-by-over choices of mobile-phone users over shopping positively influences the adoption of m-commerce activities.

Hypothesis 14: Habitual/loyalty of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

Hypothesis 15: Advice-seeking of mobile-phone users in a social network(s) positively influences the adoption of m-commerce activities.

Hypothesis 16: Advice-giving of mobile-phone users in a social network(s) positively influences the adoption of m-commerce activities.

Coefficient of Determinants R^2 Assessment

The coefficient of the determinant (R^2) determines the predictive power of a model. R^2 also measures the latent variable (LV) relationship explaining variances to its total variance. Values of approximately 0.670, 0.333, and 0.190 are considered substantial, moderate, and weak, respectively (Chin 1998). Warp-PLS 8.0 provided the R^2 for the dependent variable to be 0.38. Therefore, this study's coefficient of the determinant (R^2) can be considered moderate. Figure 11 shows the study's R^2 .

Effect Size f^2 Assessment

Effect size measures the impact of the independent latent variable on the latent dependent variable (Chin, 1998; Cohen, 1992). Urbach and Ahlemann (2010), citing Chin (1998), "the effect size is calculated as the increase in R^2 of the latent (LV) to which the path is connected, relative to the LV's proportion of unexplained variance" (Pg. 21). The f^2 values of the predictor LV (exogenous LV) are considered to have a small (0.020 and 0.150), moderate (0.150 and 0.350), and significant (> 0.350) effect on an endogenous latent variable (Gefen et al., 2000; Cohen, 1992). The proposed model in this study has sixteen exogenous variables measured against the endogenous variable, m-commerce activities. Table 29 gives the f^2 of the endogenous variables of the study's model. The variables had an f^2 on the endogenous variable m-commerce activities that ranged between 0.003 and 0.089. Since the f^2 ranged from 0.003 to 0.089, it implies that the exogenous variables have a small effect on the endogenous latent variable.

Table 29: Effect Size, f² of Exogenous LV's on M-commerce Activities

Exogenous Variables	f ²
Ease of Use of Mobile Phone	0.055
Usefulness of Mobile Phone	0.089
Trust	0.003
Cost	0.015
Usefulness of Mobile Payments	0.072
Ease of Use of Mobile Payments	0.025
Perfection-consciousness	0.023
Brand-consciousness	0.017
Novelty-variety Consciousness	0.019
Recreational-consciousness	0.004
Price-consciousness	0.012
Impulsive-consciousness	0.001
Confused-by-over choices	0.004
Habitual/loyalty -consciousness	0.012
Advice-seeking	0.021
Advice-giving	0.010

Predictive Relevance Q² Assessment

Urbach and Ahlemann (2010) suggest that a Q² coefficient > 0 is the acceptable predictive validity for an endogenous latent variable. The Q² indicates how well the model and its parameter estimates reconstruct observed values with Q² > 0, confirming the model's predictive relevance. When Q² < 0, it shows that the model does not have predictive relevance. For example, the predictive relevance of the endogenous variable m-commerce activities is 0.360 and positive, indicating that the proposed model possesses predictive relevance. Since the predictive relevance coefficient value was more significant than 0, it implies that the model had an acceptable predictive relevance.

Path Coefficients (β) Assessment

The path coefficients (β) for the proposed relationships of the models in this study are, as shown in Table 30 below, at significance levels of p<0.1, p<0.05, and p<0.01. For the sixteen (16) paths to m-commerce activities, five (5) were supported, while eleven (11) were not supported. Respectively, each path matches the proposed hypotheses tested in this study. After testing each study's hypotheses, the sign, magnitude, and path coefficient (β) significance between

independent and dependent variables are noted. Higher path coefficients indicate that the independent variable significantly affects the dependent variable.

Table 30: Proposed Model Path Coefficients Results

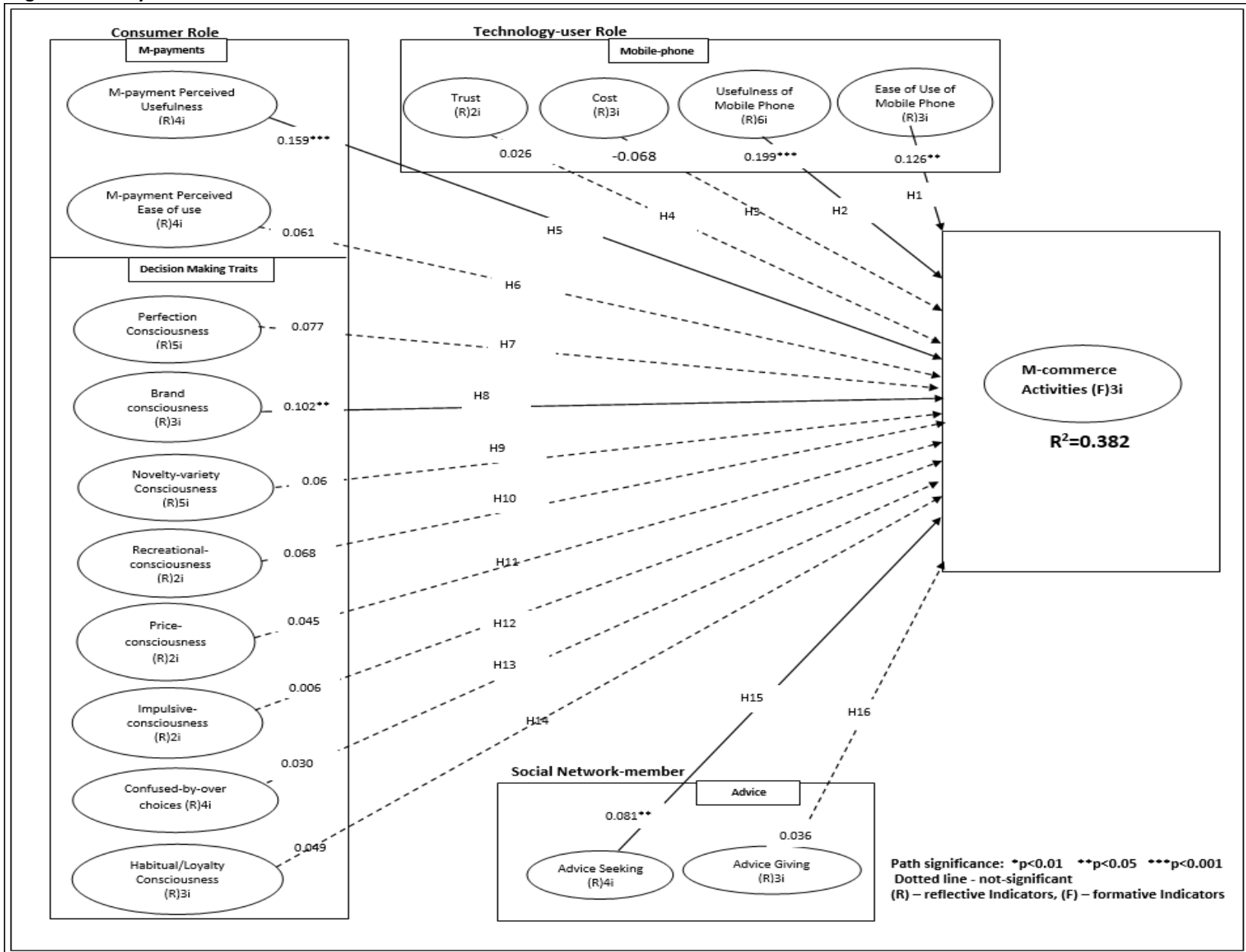
Path	Path coefficients	p-Values	
Ease of Use of Mobile Phone	0.126	0.005	Supported
Usefulness of Mobile Phone	0.199	<0.001	Supported
Trust	0.026	0.296	Not Supported
Cost	-0.068	0.083	Not Supported
Usefulness of Mobile Payments	0.159	<0.001	Supported
Ease of Use of Mobile Payments	0.061	0.105	Not Supported
Perfection-consciousness	0.077	0.056	Not Supported
Brand-consciousness	0.102	0.018	Supported
Novelty-variety Consciousness	0.068	0.081	Not Supported
Recreational-consciousness	0.026	0.296	Not Supported
Price-consciousness	0.045	0.179	Not Supported
Impulsive-consciousness	0.006	0.450	Not Supported
Confused-by-over choices	0.03	0.269	Not Supported
Habitual/loyalty -consciousness	0.049	0.157	Not Supported
Advice-seeking	0.081	0.048	Supported
Advice-giving	0.036	0.230	Not Supported

The following measures in Table 31 below were used to examine this study's proposed structural model.

Table 31: Assessment of the Structural Model in this Thesis

Criteria	Description
Coefficient of Determinant, R ²	Values of approximately .670, .333, and .190 are considered substantial, average, and weak, respectively (Urbach & Ahlemann, 2010; Chin, 1998; Hair et al., 2019)
Effect Size, f ²	Considers predictor LVs (exogenous LV) small (0.020 and 0.150), moderate (0.150 and 0.350), and significant (> 0.350 effect on an endogenous LV (Urbach & Ahlemann, 2010; Cohen, 1992; Hair et al., 2019).
Path Coefficient	It is analyzed in terms of direction, magnitude, and path coefficient significance (Urbach & Ahlemann, 2010; Hair et al., 2014).
Predictive Relevance, Q ²	Q ² > 0 confirms the model's predictive relevance in relation to a particular construct (Urbach & Ahlemann, 2010; Hair et al., 2019).

Figure 11: Study's Structural Model



5.8 Chapter Summary

Preparing the data is the first stage before the data analysis exercise is undertaken. First, the data collected through the study's questionnaire were edited. After that, the question items were coded. Next, data screening was carried out before preliminary data analysis was undertaken to assess for missing data and outliers. Once this was done, the respondents' response rate, characteristics, profile age, income, gender, and education level demographics were analyzed. Next, tests were made to determine possible differences among the respondents regarding m-commerce activities adoption. Finally, respondents' demographics, age, gender, income, and education level were subjected to an independent sample t-test and one-way ANOVA to determine differences in the studied population demographics factors.

The second part of the data analysis performed structural equation modeling (SEM) to assess the measurement and structural models. First, the measurement model (Stage one) was assessed for construct reliability and validity. Factor loading was also assessed to test the individual item reliability of the data collection instrument. Next, confirmation of the validity of each construct was done. In order to accomplish this, an assessment of convergent, composite reliability, and average variance extracted (AVE) was done. Next, all the constructs were further examined for discriminant validity and were confirmed as valid and reliable and, therefore, suitable for further analysis to perform the model's structural assessment. Finally, the study's conceptualized structural model (Stage two) was then assessed. The next chapter discusses the results to answer this study's research questions outlined in Chapter One.

CHAPTER SIX: DISCUSSIONS

6.1. Introduction

Chapter Five analyzed the study's data and the results obtained. In this chapter, this study presents an interpretation of the results and discussions around the findings.

As discussed earlier, this study focuses explicitly on mobile-phone users from their roles as technology users, consumers, and social network-member in their day-to-day activities. Therefore, it is crucial to understand these users from the perspective of the three roles and how they influence the adoption of m-commerce activities.

This chapter fulfills the aims of this study by answering the research questions (RQs) outlined in Chapter 1. These are:

1. What influence does the technology-user role of a mobile-phone user have on the adoption of m-commerce activities?
2. What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?
3. What influence does the social-network member role of a mobile-phone user have on the adoption of m-commerce activities?

The study's main objective was to identify the factors influencing mobile-phone users to adopt m-commerce activities. A literature review revealed that a limited number of studies over recent years triangulated the three perspectives of technology-user roles, consumer roles, and social network-member roles to study m-commerce activities adoption. Information systems literature and literature from extant fields, marketing, consumer, consumer behavior, and social networks, provided constructs that informed the study's research model. The study's constructs were operationalized and hypothesized to have relationships. From the study's research model, hypotheses were formulated. A cross-sectional survey study was then designed. Multivariate quantitative methods were applied to the study's data to analyze the relationship between the dependent and independent variables. Therefore, the following section presents a discussion of the findings to answer the research questions posed in this study.

6.2. Technology-user role of a mobile-phone user and its influence on m-commerce activities

As stated previously, the present study recognizes that after individuals become mobile-phone users, they will then decide on adopting m-commerce or not (Chi, 2018; Rajabion, 2015, Huo et al., 2011; AlHinai et al., 2007). Therefore, information systems adoption literature was used to identify factors to answer this study's research question: *What influence does the technology-user role of a mobile-phone user have on the adoption of m-commerce activities?* The following factors, perceived ease-of-use, perceived usefulness, cost, and trust, were identified to answer the above research question. The following section discusses these factors and their relationship with m-commerce activities.

6.2.1. Perceived ease-of-use of a mobile phone and the m-commerce activities adoption

Perceived ease-of-use refers to *“the degree to which an individual believes that using a technology would be free of physical and mental effort.”* Empirical data support perceived usefulness and perceived ease-of-use as primary predictors of mobile technology adoption (Phan & Daim, 2011; Conci et al., 2009; Hong et al., 2008; Sarker & Wells, 2003). Therefore, a relationship between perceived ease-of-use and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that perceived ease-of-use was found to have a statistically significant positive influence ($\beta = 0.126$, $p < 0.005$) on m-commerce activities. Hence, hypothesis 1: *the perceived ease-of-use of the mobile-phone positively influences the adoption of m-commerce activities* was supported. Thus, a one-unit increase in mobile phone perceived ease-of-use leads to a 0.126 unit increase in m-commerce activities adoption. Furthermore, a mobile phone's perceived ease-of-use in conducting business was found in this study as the third strongest predictor of m-commerce activity.

The mobile-phone perceived ease of use allowed the majority of users to find it easy not only to make calls but also to send text messages and perform money transfer activities. With time, individuals become more familiar with mobile-phone devices as they learn to use them, and they become easy to use. They also become useful to users by allowing them to conduct transactions without time and space constraints. Information systems researchers have argued that perceived usefulness and perceived ease-of-use positively influence the intention to use the technology

adoption (Pipitwanichakarn & Wongtada, 2020; Chong, 2013; Faqih & Jaradat, 2015). Therefore, mobile-phone users will adopt m-commerce activities because of the perceived ease-of-use and usefulness.

6.2.2. Perceived usefulness of a mobile phone and the m-commerce activities adoption

As discussed above information systems researchers have identified perceived ease-of-use of a technology and perceived usefulness as important factors in the technology acceptance model (TAM) to predict the acceptability of an information system (Davis, 1989; Venkatesh & Davis, 2003, Lee et al., 2003). Davis (1989) defines perceived usefulness as “*the degree to which a person believes that using a particular system would enhance his or her job performance.*” This factor has been extensively used in information systems studies to explain an individual’s behavior towards a new technology (Hong et al., 2008; Venkatesh et al., 2003). Therefore, a relationship between perceived usefulness and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that perceived usefulness was found to have a statistically significant positive influence ($\beta = 0.199$, $p < 0.001$) on m-commerce activities. Hence, hypothesis 2: *the perceived usefulness of the mobile-phone positively influences the adoption of m-commerce activities* was supported. Thus, a one-unit increase in mobile phone perceived usefulness leads to a 0.199 unit increase in m-commerce activities adoption. Mobile phone perceived usefulness in conducting business was found in this study as the strongest predictor of m-commerce activity.

Researchers have indicated that people will appropriate technology if they find it useful and easy to use and if it fits their daily lives (Carroll et al., 2003). Chong (2013) argues that mobile technology users are becoming more familiar with mobile devices as they become useful in performing various tasks and are easy to use. For instance, Morawczynski (2007, 2008) carried out studies in Kenya that showed a population already using mobile-phones and embracing them for other use such as money mobile money transfers. The mobile-phone was also used in other innovative ways as a money store for future use, making payments for utility and school fees (Kiringai et al., 2010; Morawczynski, 2007). Mobile-phone users in Kenya found mobile money useful technology and helped save time; it provided a secure method of sending money and a cheaper means to transfer money considering what was previously used. This study data has

shown that mobile-phone users' perceived usefulness positively influences the adoption of m-commerce activities.

6.2.3. Perceived cost and the m-commerce activities adoption

Researchers have argued that perceived price or cost is a major component required in the operation of m-commerce (Dongmo et al., 2020; Cedeno, 2019; Yadav et al., 2016; Wei et al., 2009). It is one reason that can slow down the m-commerce uptake (Wei et al. 2009). Wei et al. (2009) define perceived cost as the degree to which an individual perceives IT as costly. A relationship between cost and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that cost was found to have a negative influence ($\beta = -0.068$, $p = 0.083$) on m-commerce activities. However, this influence was not statistically significant. Hence, hypothesis 3: *the perceived high cost of mobile technology negatively influences the adoption of m-commerce activities*, was not supported.

Luarn and Lin (2005) identified cost as the initial purchase of the handset, usage, subscription, service, communications, maintenance, and upgrade costs. Anil et al. (2003) also found cost to be one of the factors that influenced the adoption of m-commerce in Singapore. Other researchers, such as Wei et al. (2009), also argued that cost could be an obstacle to the effective progression of m-commerce. Dongmo et al. (2020) also found that perceived cost significantly influences behavioral intention, therefore, the individual's intention to adopt m-commerce. Perceived cost negatively influenced the behavioral intention to take the adoption decision. This study identified cost as playing an important role in the adoption of m-commerce activities as it can discourage mobile-phone users from adopting m-commerce activities. However, the study data did not corroborate the study's hypothesis that the perceived high cost of mobile technology negatively influences the adoption of m-commerce activities.

6.2.4. Trust and the m-commerce activities adoption

Trust is an important predictor of technology adoption (Chong, 2013; Wei et al., 2009; Cho et al., 2007). Trust is “*a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another*” (Rousseau et al., 1998). McKnight (2012) points out the importance of trust. He argues that trust helps individuals prevail over perceptions of uncertainty and risk. Gefen et al. (2008) also argue that trust helps build an

appropriate and favorable expectation of performance and other desired benefits. A relationship between trust and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that trust was found to have a positive influence ($\beta = 0.026$, $p = 0.296$) on m-commerce activities. However, this influence was not statistically significant. Hence, hypothesis 4: *the perceived trust that mobile technology positively influences the adoption of m-commerce activities* was not supported

Researchers have pointed out the uncertainty and risk associated with the m-commerce environment (Nguyen and Huynh, 2018; Chong, 2013; Gefen et al., 2008; Cho et al., 2007). In an m-commerce environment, buyers and sellers transact without meeting face-to-face; therefore, trust becomes important compared to traditional commerce. Cho et al. (2007) also recognize information asymmetry when transacting in m-commerce environments. According to Pavlou (2003), information asymmetry is the difference in the amount of information possessed between the buyer and seller. Cho et al. (2007) say that this can lead to opportunistic behavior. For example, a buyer may misrepresent a product's quality to the seller, leading to mistrust. M-commerce users also fear their personal information and payments being intercepted and later used without their knowledge (Luarn & Lin, 2005). Some studies on m-commerce adoption show that trust is a key factor in adopting m-commerce (Mashagba et al., 2013; Chong, 2013). For example, Chong (2013) points out that privacy risks and security in m-commerce can be pretty high as mobile devices store users' personal information, and vendors can access this information. Perceived trust has been shown as positively related to the intention to use m-commerce (Pipitwanichakarn and Wongtada, 2018), to adopt e-payments and m-payments (Nguyen and Huynh, 2018; Shin, 2009), to use e-banking (Sanchez-Torres et al., 2018; Zhang et al., 2018), to adopt m-banking (Shaikh et al., 2015). Therefore, this study espoused trust as a crucial element in adopting m-commerce activities. However, the study data did not corroborate the study's hypothesis that the perceived trust in mobile technology positively influences the adoption of m-commerce activities.

The section above discussed the findings on the technology-user role's influence on the adoption of m-commerce activities. The following section discusses the relationship between consumer role and the adoption of m-commerce activities.

6.3. Consumer role of a mobile-phone user and its influence on the m-commerce activities

As stated earlier, mobile-phone users play a consumer role, which makes the fundamental difference between m-commerce adoption studies and most traditional technology adoption studies (Chi, 2018; Rajabion, 2015, Huo et al., 2011; AlHinai et al., 2007). An individual must first subscribe to a mobile telephone service provider and make payment before becoming a mobile phone user. Then, in turn, decide whether or not to use m-commerce.

This study sought to answer the research question: *What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?* Previously described in this study, the consumer role as a part a mobile-phone user plays in their daily activities to purchase goods and services and make purchase-related decisions. This entailed:

- (i) Making payments through the mobile-phones (m-payments) - measured using two (2) factors, m-payments perceived ease-of-use and m-payment perceived usefulness.
- (ii) Making decisions - measured using eight (8) factors, perfection-conscious, novelty-variety-conscious, brand-conscious, habitual/loyalty-conscious, impulsive-conscious, recreational-conscious, price-conscious, and confused-by-over choices.

The following section discusses the relationship between m-payments and the adoption of m-commerce activities.

6.3.1. M-payment Activity

In this study, m-payment perceived usefulness and m-payment perceived ease-of-use were used to measure m-payment, which a mobile-phone user performs while playing the consumer role. M-payment perceived usefulness measured the extent to which mobile-phone users found making m-payments useful. In contrast, m-payment perceived ease-of-use gauged the degree to which mobile-phone users found making m-payments easy to use in business.

6.3.1.1. M-payment perceived usefulness and the m-commerce activities adoption

This study hypothesized that mobile-phone users play a consumer role; making m-payments is one of their many activities. Therefore, a relationship between m-payment perceived usefulness and m-commerce activities were analyzed.

The results from PLS-SEM in Table 30 show that m-payment perceived usefulness was found to have a statistically significant positive influence ($\beta = 0.159$, $p < 0.001$) on m-commerce activities. Therefore, hypothesis 5: *the m-payment perceived usefulness positively influences the adoption of m-commerce activities* was supported by the study data. Thus, a one-unit increase in m-payment perceived usefulness leads to a 0.159 unit increase in m-commerce activities adoption. Furthermore, m-payment's perceived usefulness in conducting business was found in this study as the second strongest predictor of m-commerce activity. Therefore, from the study data, it can be argued that if a mobile-phone user playing the consumer role finds m-payment more useful, this will positively influence them to adopt the m-commerce activities.

It is worth discussing these exciting facts revealed by the study results. First, the study findings show that m-payment perceived-usefulness impacts m-commerce activities adoption. Payments are required to use the internet and access a good portion of services and content, such as news articles, digital newspapers, magazines, journal articles or reports, software and apps, and particular websites. Despite a growing notion that the bulk of news and entertainment content on the web is free, reports have shown that a good part of the content available on the internet requires payment (API, 2015). Researchers have also indicated that charging for online content is common (Lopes & Galletta, 2006). A study by Pew Research Center shows that 65% of internet users in the US paid to access or download content from the web (Jansen, 2010). Research conducted by Media Insight Project in 2015 also indicated that 40% of the millennial generation in the US paid for news and other services out of their pocket (API, 2015). In sub-Saharan Africa, however, access to news and information is less common than socializing and entertainment (Pew Research Center, 2018). The Pew Research Center (2018) report indicates that in SSA, there are far fewer individuals accessing news and information from the internet using mobile-phones at 53%. The report further shows that this is followed by those accessing health and medical information at 41%, compared to 85% who use the mobile-phone for social and entertainment purposes - staying in touch with family and friends. Even though this is the case, payments are required for internet connections to access content, and m-payment becomes useful to facilitate the transaction. Pew Research Center (2018) report further says that adult mobile-phone users in SSA are more likely to use mobile-phones for making and receiving payments. For example, 79% of individuals in Kenya use basic/feature phones to make

payments. In South Africa, the figures are slightly lower, with 25% using basic phones and 54% using smartphones to make payments.

Today, mobile-phone users are accessing various services, including social media applications such as WhatsApp, Twitter, Telegram, Instagram, TikTok, and Facebook, which are rapidly used for content delivery. The content keeps users informed and connected with friends and relatives. Though there is no direct payment for social media applications, payment is required for an internet connection to access them, including the content. Therefore, the need for mobile-phone users to make payment for the internet connection to have access to content.

Over-the-top (OTT) media content in Kenya is becoming popular. As discussed in this thesis, factors attributed to its increased popularity include the availability of low-cost, mobile data-enabled phones and affordable mobile data bundles. It is also influenced by the ease of making m-payment to purchase mobile data bundles to access these services. Also discussed earlier, Kenya's number of internet users has been steadily growing and now stands at 49.9 million, with 99.9% on mobile data (CA, 2019). Google's Consumer Barometer report (2016) indicated that smartphone uptake in Kenya was at 44%, up from 27% in 2014. Today, reports indicate that smartphone penetration has been growing over the past five years due to the influx of inexpensive phones (Pew Research Center (2018)). Thus, this shows a shift from using feature/basic phones that have dominated mobile devices in Kenya. The growth in the uptake of smartphones and the increase in internet users indicate that more and more Kenyans are going online and consuming online content. These developments also show that much of the online content consumed today in Kenya is happening on the go through low-cost data-enabled phones. Mobile-phone users in Kenya today are better placed to consume online content with the proliferation of better technology such as smartphones and increased bandwidth at a cheaper cost, coupled with a maturing m-payment platform.

Online entertainment over the mobile-phone is now becoming popular in sub-Saharan Africa. As stated above, mobile devices are more used for social and entertainment purposes than for information-seeking (Pew Research Center, 2018). Initially introduced as ringtones, but today with the improvement of internet bandwidth and affordable smartphones, streaming videos, music, and gaming entertainment over the mobile-phone is an everyday activity. The Pew Research Center (2018) report further indicates that more than three-quarters of sub-Saharan

Africans who go online also use social media and access entertainment content such as music, movies, and sports. The report further shows that 61% of those who go online consume entertainment in music and movies, followed by sports at 57%. Much of the online entertainment content mobile-phone users stream over the mobile-phone device is accessible for free over the internet. While mobile-phone users may not be making direct payments to purchase online entertainment content they consume, they make payments for connecting to the internet to access the content. In Kenya, for example, the Communications Authority of Kenya (CA, 2019) quarterly report shows sharing of messages, photos, videos, and information is on the rise among people in Kenya. Researchers have also cited that sharing photos and videos among friends and relatives is entertainment (Sponcil & Gitimu, 2012; Sheldon, 2008). Mobile-phone users also create entertainment content using social media applications such as WhatsApp, Twitter, Instagram, and TikTok and share it with friends and relatives. Therefore, researchers have argued that entertainment is a leisure activity (Hew et al., 2016). Mobile-phone users interact with service providers, utilize wireless telecommunication networks, and incur transaction costs during usage. Transaction costs may not necessarily be direct but paid through the internet connection.

Researchers have, therefore, indicated the critical role m-payment plays in the success of m-commerce (Teo et al., 2015). As m-commerce increases in popularity to offer content and entertainment, m-payments are required to facilitate secure online commercial transactions between organizations or individuals (Ondrus & Pigneur, 2006). Other researchers have also indicated that m-payments enable feasible and convenient m-commerce transactions (Mallat, 2007). Provision of m-payments to customers can help m-commerce organizations to achieve competitive advantage and, therefore, issues associated with appropriate m-payment usage are of critical importance (Au & Kauffman, 2008; Mallat, 2007; Ondrus & Pigneur, 2006). Chang et al. (2009) argue that functional m-payment systems are those built around established habits and practices of the users – that is, they should be able to support users' routine day-to-day activities. For example, m-payments in Kenya support various payment activities individuals are engaged in; they offer some benefits over traditional payment methods, i.e., mobility, safety, and efficiency. These advantages make m-payments more practical than traditional payment modes, such as cash, checks, credit cards, and e-payments to complete transactions.

In conclusion, from the above discussion, m-payments are critical for the success of m-commerce activities, and this study found m-payments perceived usefulness to influence m-commerce activities positively. This study's results are consistent with the theoretical perspective of the technology acceptance model, which identifies perceived usefulness as a prime factor influencing the adoption of new technology. The results of this study are also consistent with what other researchers have argued about the critical importance of m-payments for the success of m-commerce (Teo et al., 2015; Gao et al., 2005). Nambiar and Lu (2005) have also indicated that m-payments' play a central role in m-commerce as physical payments give way to virtual payments bringing enormous benefits to individuals and merchants.

The relationship between m-payment perceived usefulness and the adoption of m-commerce activities has been discussed above. The following section discusses findings of the relationship between m-payment perceived ease-of-use and m-commerce activities adoption.

6.3.1.2. M-payment perceived ease-of-use and the m-commerce activities adoption

M-payment perceived ease-of-use in this study measured the extent to which mobile-phone users found making m-payments easy to use in conducting business. This study examined a relationship between m-payment perceived ease-of-use and m-commerce activities.

The results from PLS-SEM in Table 30 in this study found m-payment perceived ease-of-use had a non-significant influence ($\beta = 0.061$, $p = 0.105$) on m-commerce activities. Therefore, hypothesis 6: *Perceived usefulness of m-payments positively influences the adoption of m-commerce activities* was not supported. This means that the adoption of m-commerce activities is not influenced by the m-payment perceived ease of use to conduct business.

A possible explanation could be that most m-payment users may have already adopted the m-payment platform to make payments for various services and goods and find it easy to use. For example, according to Wamuyu (2014), mobile money and m-payments in Kenya were spontaneous – that is, it was simple to understand and did not require the user to learn a complete set of new skills. Transactions could be completed using simple steps on basic/feature phones. M-payments in Kenya, for instance, are today used to pay for an array of services. These services range from helping others pay for medical expenses, school fees, or payments related to work,

both casual and regular labor contracts, rental payments, and different business transactions (Johnson, 2014). Studies conducted in Kenya have shown the ease with which money circulates in the economy, and individuals can remit payments anytime and anywhere for business transactions (Tiwari & Deepti, 2013). Thus, individuals today are capable of quickly making m-payments for a range of products and services. These m-payments are done irrespective of whether a person is banked or not. M-payments are also linked to banks, making it easy to transfer money to and from a bank account. Thus, the range of transactions that m-payment can perform is increasing, and so is the amount transacted through the m-payment platform.

Statistics show that worldwide m-payment revenue in 2015 was 450 billion U.S. dollars and surpassed 1 trillion U.S. dollars in 2019 (Statista Inc., 2020). In Kenya, statistics indicated that during the same period in 2015, over 40% of the country's GDP flowed through the M-Pesa m-payment platform (Friedlander, 2016). Furthermore, transactions worth Ksh 1.9 trillion of goods and services were transacted in the third quarter of 2018/2019 (CA, 2019). This transaction level indicates that most Kenyans make much of the micropayment transactions through mobile phones. It, therefore, can be argued that the perceived ease of use in making m-payments for business and financial transactions contributes to the phenomenal use of m-payments, thus promoting m-commerce activities. However, this study found no statistically significant causal relationship between m-payment perceived ease-of-use and the adoption of m-commerce activities. Therefore, m-payments may be easy to use for a majority to make payments for goods and services and is no longer a significant factor contributing to the adoption of m-commerce service.

However, this study's results are inconsistent or contrary to what researchers have said in previous studies. For example, M-payments are critical to the success of m-commerce (Teo et al., 2015). Other researchers, Nambiar and Lu (2005), have also indicated that for individuals to perform m-commerce, it will be influenced by m-payment perceived ease-of-use

To answer this study's research question, "*What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?*" This study argued that as consumers, mobile-phone users make payments. Therefore, mobile-phone users should find m-payments useful and easy to use, influencing them to adopt m-commerce activities. This study found that

the consumer role of mobile-phone users influences them towards adopting m-commerce activities when they find m-payments useful in conducting business.

The section above looked at the relationship between perceived usefulness and perceived ease-of-use of m-payments in conducting business and their influence on adopting m-commerce activities. The following section discusses the relationship between decision-making activities performed by mobile-phone users when playing the consumer role and the adoption of m-commerce activities.

6.3.2. Consumer decision-making

In this study, consumers are considered to differ considerably in the way they make decisions while shopping. Sproles and Kendal (1986) posit that consumer decision-making styles are viewed as mental, cognitive orientation towards purchasing and shopping. Along the same lines, Scott and Bruce (1995) also claim that consumer decision-making styles can be habitual patterns learned, dominate consumers' choices, and constitute a relatively enduring consumer personality. Consumer decision-making styles then describe how consumers shop.

Sproles and Kendal (1986) put eight consumer-related traits together to form the consumer decision-making styles: perfection-conscious, brand-conscious, novelty-variety conscious, habitual/loyal, impulsive-conscious, confused-by-over-choice conscious, and price value-conscious. In the next section, this study discusses the causal effect of consumer decision-making traits on m-commerce activities.

6.3.2.1. Perfection-conscious trait and the m-commerce activities adoption

This study postulated that mobile-phone users play a consumer role, and making decisions is one activity individuals engage in when buying goods and services. Therefore, the perfection-conscious trait in this study was used to measure the extent to which mobile-phone users made decisions concerning quality and systematically searched for the best quality products possible. In addition, a relationship between perfection-conscious decision-making traits and m-commerce activities was analyzed.

The results in Table 30 show that the perfection-conscious trait was not found to have a statistically significant positive influence ($\beta = 0.077$, $p = 0.056$) on m-commerce activities. Hence, hypothesis 7: *Perfection-consciousness of mobile-phone users towards shopping*

positively influences the adoption of m-commerce activities is not supported by the study data. Thus, a one-unit increase in perfection-conscious traits will lead to a 0.077 unit increase in the adoption of the m-commerce activities. Therefore, one could argue that if mobile-phone users playing the consumer role possess a perfection-conscious decision-making trait, this will not influence them towards adopting m-commerce activities.

Since the inception of the internet, it has revolutionized the world at unprecedented speed, and today the mobile-phone is the primary tool supporting its rapid acceleration. At the touch of a button, it provides life-enhancing information and services available to users. For most individuals, mobile-phones offer the only method of accessing the internet - so growth in internet access drives digital inclusion, especially in developing economies. The GSMA (2019) report shows that almost half of the world's population is connected to the internet, and of these, 40% live in developing economies compared to 75% who live in high economies. For example, Kenya's telecommunications market has been undergoing considerable changes that have seen the cost of broadband access fall by 90%, making access to broadband internet affordable to a large population. CA (2019) sector statistics show that 99.9% of internet subscribers in Kenya accessing the web use a 3G/4G connection. This increased subscription shows that more and more Kenyans are getting online to search for content. Secondly, inexpensive smartphones are now readily available in the Kenyan market today. Most Kenyans are, therefore, using mobile-phones for content delivery. Mobile technology, for that reason, gives consumers a platform to engage in a more detailed search for products and services so that they can make informed decisions before purchasing. Individuals can seek information across website sites to find suitable alternatives to goods and services while enjoying the advantages of anytime and anywhere content availability through mobile-phones.

Mobile-phone users characterized as perfection-conscious consumers now have a platform they can use to seek more information about products and services to meet their quality requirements. They are likely to conduct extensive comparisons and can do this everywhere, anytime, without the limitations of time and space. Past studies have pointed out that individuals with perfection-conscious traits shop more carefully and systematically (Park & Gretzel, 2010). They are often not satisfied with good enough when it comes to products and services and, therefore, require engaging in a more refined search. Researchers Wesley et al. (2006) have also argued that

individuals with high perfectionism are associated with substantial planned expenditure, emphasizing product quality instead of price. This study found that the perfection-conscious trait had a statistically non-significant positive influence on m-commerce activities adoption. This study's findings support other findings that have shown that consumers who are perfection conscious, i.e., those who seek high-quality pursuits, negatively influence online shopping (Lim et al., 2016). They argue that these consumers are more suspicious of online shopping because they may not have full details of the quality of their purchasing products, thus cutting down their online shopping enthusiasm.

6.3.2.2. Brand-conscious trait and the m-commerce activities adoption

Brand-conscious consumers are those who are concerned with getting the most expensive, more so well-known brands. This study used the brand-conscious trait to measure the extent to which mobile-phone users were concerned with getting the most expensive well-known brands. In addition, a relationship between brand-conscious decision-making traits and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that the brand-conscious trait was found to have a statistically significant positive influence ($\beta = 0.102$, $p = 0.018$) on the m-commerce activities. Hence, hypothesis 8: *Brand-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities*, was supported by the study data. Thus, a one-unit increase in brand consciousness leads to a 0.102 unit increase in m-commerce activities adoption. Furthermore, consumer brand consciousness was found in this study as the fourth-strongest predictor of m-commerce activity. Hence, one could argue that if a mobile-phone user playing the consumer role possesses a brand-conscious decision-making trait, they will be influenced to adopt the m-commerce activities.

According to Winkler and Buckner (2006), individuals who purchase well-known, expensive, and widely advertised brands are likely to find the latest trending brands in the entertainment media, such as music videos, movies, and online games. This is because entertainment media makes a platform where branded products convey a sense of realism to a set or scene (Balasubramanian, 1994; Chang et al., 2009; Homer, 2009). Marketers, therefore, purposefully integrate and position product brands into an entertainment medium as a marketing technique

designed to influence the audience and result in commercial benefit. Today, marketers use music videos, movies, and online games to promote brands.

Studies have indicated a relationship between brand consciousness and entertainment (Nelson & McLeod, 2005; Keum et al., 2004). For example, in the study by Keum et al. (2004), they argue that brand-conscious individuals look to and appreciate the entertainment media and celebrities for information related to the latest fashions, trends, and brands. Likewise, Nelson and McLeod (2005) found, in their study on adolescent brand-consciousness and product placement, that high brand-conscious adolescents showed greater awareness of product placement, which is now commonplace in electronic games, movies, TV shows, and music. They also point out that specific behaviors such as web browsing and online gaming could offer more brand-related material than others such as chatroom and email.

However, a survey by Procter & Gamble in 2016 revealed that a paltry 1% of Kenyan retail sales went through e-commerce, citing logistical and operational challenges online shoppers face. According to Sun and Chi (2017), companies sell apparel brands through mobile websites in major countries such as the United States. In countries like China, small and medium-sized companies have to sell through national reputable online platforms where a higher percentage of Chinese m-commerce users search and find what they want through these popular platforms. In addition, these platforms provide an additional quality warranty to shoppers through agreements with product suppliers. Japan is the second-largest luxury market after the United States and has 9% of all global luxury sales in the country (Flora, 2017). Brands may not sell online in such a country partly because brick-and-mortar remains a popular luxury shopping outlet. In Kenya, reputable online platforms are yet to be established, streamlining logistical and operational challenges online shoppers face and providing an additional quality warranty to online shoppers. However, this study found that brand-conscious traits statistically influence the adoption of m-commerce activities. This study's findings support Nelson and McLeod's (2005) findings. Consequently, this study concludes that a mobile-phone user with a brand-conscious trait is likely to be influenced towards adopting the m-commerce activities.

6.3.2.3. Novelty-Variety-Conscious trait and the m-commerce activities adoption

Novelty-conscious consumers prefer novel and innovative products and are excited by looking out for new items (Sproles & Kendal, 1986). They are mindful of new styles and trends. A

relationship between novelty-variety-conscious decision-making trait and the m-commerce activities were analyzed.

The result from PLS-SEM in Table 30 shows that the novelty-variety-conscious trait was found to have a statistically non-significant positive influence ($\beta = 0.068$, $p = 0.081$) on the adoption of m-commerce activities. Hence, hypothesis 9: *Novelty-variety-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities* is not supported by the study data. Therefore, one could argue that if a mobile-phone user playing the consumer role possesses a novelty-variety-conscious decision-making trait, this will not influence them to adopt m-commerce activities.

As discussed previously, entertainment media sources such as movies, music videos, and online gaming provide consumers with a platform for new trends, brands, and best prices and a place to check out new fashion items from time to time. Studies have also shown that online auctions found that individuals needing to find novel products influence perceived shopping value and behaviors related to online shopping (Vishwanath & Barnett, 2005; Peters & Bodkin, 2007; Lee et al., 2009). Novelty-variety-conscious consumers, therefore, can take advantage of online sources for content delivery on a novel and a range of information. Previous studies have shown that novelty-variety-conscious influences online shopping positively (Coward & Goldsmith, 2007). Furthermore, before online shoppers purchase goods and services, they can use online content delivery media to access information about services and products, which helps them build a knowledge base before purchasing. The m-commerce activities, therefore, provide novelty-variety-conscious individuals the added advantage of accessing information anywhere, anytime, and everywhere on trending and a variety of products and services.

As more Kenyans are getting online, they can access wireless entertainment content such as movies, music videos, and online gaming, which updates them on novel and variety trends as they unfold in the fashion market worldwide. Entertainment media sources such as movies, music video, and online gaming provides a platform for information that novelty-variety-conscious consumers require. Therefore, it is surprising that this study found that a mobile-phone user with a novelty-variety-conscious trait will not be influenced towards adopting the m-commerce activities. The results of this study, therefore, are not consistent with other studies that have found that an individual with the need to find novel products influences perceived shopping

value and behaviors related to online shopping (Vishwanath & Barnett, 2005; Peters & Bodkin, 2007; Lee et al., 2009).

6.3.2.4. Recreational-conscious and the m-commerce activities adoption

Also discussed earlier, recreational-conscious consumers are those shoppers who seek satisfaction in shopping and do it just for fun (Lysonski & Durvasula, 2013; Sproles & Kendal, 1986). According to Kang et al. (2014), shoppers with this decision-making style consider shopping pleasurable, entertaining, and enjoyable. Therefore, a relationship between recreational-conscious and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that recreational-conscious was found not to have a statistically significant influence ($\beta = 0.0026$, $p = 0.296$) on m-commerce activities. Hence, hypothesis 10: *Recreational-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities* was not supported.

Recreational-conscious consumers often make unplanned purchases from different stores and browse products at length to enhance the shopping journey (Rezaei, 2016). This decision-making style has also been tied to how frequent online purchases are made and the amount of money spent online (Coward and Goldsmith, 2007). Dennis et al. (2010) found that consumers who took pleasure in shopping online had a positive approach towards shopping through websites and were likely to spend more time on the visited websites. This study argued that mobile-phone users with a positive attitude towards shopping through websites would adopt m-commerce activities. However, the study data did not corroborate the hypothesis that the recreational consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities.

6.3.2.5. Price-conscious and the m-commerce activities adoption

Price-conscious consumers are those concerned with getting the lowest prices in the marketplace (Rezaei, 2015; Kang et al., 2014). They are considered comparison shoppers and are associated with finding preferred items at the best prices possible (Park & Gretzel, 2010). A relationship between price-conscious and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 show that price-conscious consumers were found not to have a statistically positive influence ($\beta = 0.0045$, $p = 0.179$) on m-commerce activities. Hence,

hypothesis 11: *Price-consciousness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities* was not supported.

As earlier discussed, research shows that price-conscious consumers endeavor to acquire the best value for their money (Cowart & Goldsmith, 2007; Bakewell & Mitchell, 2003). Shim and Koh (1997) point out that price-conscious consumers form utilitarian shoppers. Dennis et al. (2010) noted that social shopping websites gave utilitarian shoppers the advantage of comparing prices and discounts. Today, comparison shoppers are likely to use a mobile-phone to check for prices online and thus adopt m-commerce activities. However, this study's data do not corroborate other studies that have found that price-conscious consumers will be influenced toward adopting m-commerce activities.

6.3.2.6. Impulsive-conscious and the m-commerce activities adoption

Impulsive consumers are those who never plan their shopping and tend to buy spontaneously. They are not concerned about how much money they spend (Sproles & Kendal, 1986). A relationship between impulsive-conscious and the m-commerce activity was analyzed. The present study shows that the impulsive-conscious trait does not predict the adoption of m-commerce activities.

Thus, the results from PLS-SEM in Table 30 demonstrate that the impulsive-conscious trait ($\beta = 0.006$, $p = 0.450$) was found not to have a statistically significant influence on the m-commerce activity. Hence, hypothesis 12: *Impulsiveness of mobile-phone users towards shopping positively influences the adoption of m-commerce activities* is not supported by the study data. In this case, the adoption of the m-commerce activities is not influenced by the impulsiveness of mobile-phone users.

Therefore, the results of this study are inconsistent with other studies, such as Zhang et al. (2006), that have shown that impulsive consumers have a positive relationship with their intention to purchase online. Furthermore, Punj (2011) also argues that impulsive consumers perceive the m-commerce experience as valuable and enjoyable and enjoy a variety-seeking purchasing experience. Therefore, this study's data do not corroborate other researchers that have argued that the swiftness of online shopping will attract such consumers to adopt m-commerce activities.

6.3.2.7. Confused-by-over choices (choice overload) and the m-commerce activities adoption

Confused-by-over choices (choice overload) consumers are overwhelmed by the numerous brands and shops to choose from. As a result, they are likely to be overwhelmed in the marketplace. Such consumers find the marketplace confusing, view brands as alike, and seek assistance from acquaintances (Sproles & Kendal, 1986). A relationship between confused-by-over choices of mobile-phone users and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 demonstrate that Confused-by-over choices (choice overload) was found not to have a statistically positive influence ($\beta = 0.030$, $p = 0.269$) on m-commerce activities. Hence, hypothesis 13: *Confused-by-over choices of mobile-phone users over shopping positively influences the adoption of m-commerce activities* is not supported by study data.

Researchers Kang et al. (2014) argue that to decrease the confusion from too much choice and confused-by-over choices (choice overload), consumers may ask for recommendations from others and rely on product reviews. For example, a study by Dennis et al. (2010) found that young women were motivated to shop online when websites provided more shopping information on products. Therefore confused-by-over choices, consumers will find reviews offered by other online shoppers helpful in narrowing down their choices. However, this study's data do not corroborate other studies that have found that consumers' confused-by-over choices will influence the adoption of m-commerce activities.

6.3.2.8. Habitual/Loyalty-Conscious and the m-commerce activities adoption

Habitual/loyal consumers have specific products they purchase and rely on conventional shopping channels for purchasing and thus have formed habits around their purchases and shopping channels. Therefore, a relationship between habitual/loyalty-conscious decision-making traits and m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 demonstrate that the habitual/loyal-conscious trait was found not to have a statistically positive influence ($\beta = 0.049$, $p = 0.157$) on m-commerce activities. Hence, hypothesis 14: *Habitual/loyalty of mobile-phone users towards shopping positively influences the adoption of m-commerce activities* is not supported by the study data. One could argue that if a mobile-phone user playing the consumer role possesses a

habitual/loyalty-conscious decision-making trait, they will not be influenced to adopt m-commerce activities. This study's data do not corroborate other studies that have found that consumers with habitual/loyalty decision-making styles are positively influenced towards performing online transactions such as online travel shopping (Park, 2007).

Mobile-phones connect habitual/loyal-conscious individuals on the go to their favorite brands, stores, and or websites where they shop. Therefore, content delivery provides habitual/loyal-conscious individuals with information on brands, stores, and websites. Literature shows habitual/loyal consumers have favorite brands, stores, or websites from which they purchase items (Konus et al., 2008; Kamaruddin & Mokhlis, 2003; Sproles & Kendal, 1986). Usually, habitual/loyal consumers rely on specific products and familiar shopping channels, and they do not readily switch. According to Bettman and Sujan (1987), previous experience forms the basis of their information search and decision-making processes.

To answer this study's research question, "*What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?*" This study argued that as consumers, mobile-phone users make payments, and they also make decisions. Of the eight (8) consumer decision-making traits, brand consciousness positively influenced mobile-phone users towards adopting m-commerce activities. The study further found that m-payments' perceived usefulness plays an essential role in m-commerce activities adoption. Therefore, the consumer role of a mobile-phone user influences the adoption of m-commerce activities through m-payment usefulness and brand-conscious trait.

6.4. Social Network-member role of a mobile-phone user and its influence on the m-commerce activities

This perspective considers factors that relate to an individual's surroundings and interactions with other people in his/her network of family, friends, colleagues, and other close people (Chi, 2018; Rajabion, 2015; Huo et al., 2011; AlHinai et al., 2007). Social network member role context generally refers to an individual interacting with others in a social network they are embedded in. Social network(s) individuals create for advice-seeking or advice-giving to others was used to answer the present study's research question: *What influence does the social network-member role of a mobile-phone user have on adopting m-commerce activities?*

6.4.1. Social Network-member activity

This study describes a social network-member as a role that individuals perform while engaging with others in a social network(s). This study used advice-seeking and advice-giving measures to measure social network-member. Advice-seeking measured the extent mobile-phone users received information, advice, or help from kin, relatives, and friends. At the same time, advice-giving measured the extent to which mobile-phone users provided information, advice, or help to kin, relatives, and friends.

The following section discusses the findings of the relationship between advice-seeking and the adoption of m-commerce activities.

6.4.1.1. Advice-seeking and the M-commerce activities adoption

The advice-seeking in this study measured the extent to which mobile-phone users got information, advice, or help when interacting with others in a social network(s). In addition, a relationship between advice-seeking and m-commerce activities was analyzed.

The results in Table 30 revealed that advice-seeking was found to have a statistically significant positive influence ($\beta = 0.081$, $p < 0.048$) on the m-commerce activities. Hence, hypothesis 15: *Advice-seeking of mobile-phone users in a social network(s) positively influences the adoption of m-commerce activities* is supported by the study data. Thus, a one-unit increase in advice-seeking leads to a 0.081 unit increase in the adoption of m-commerce activities. Advice-seeking was found in this study as the fifth strongest predictor of m-commerce activity. One could argue that if mobile-phone users seek advice more from their social network(s), they will be influenced to adopt m-commerce activities.

Seeking information is a behavior that arises from the need for information (Wilson, 1999). Reading materials such as books, magazines, and journals have traditionally been seen as sources of information. The information-seeking behavior of these sources is different from information-seeking behavior about online resources, such as social media (Balakrishnan & Gan, 2016; Borrego & Anglada, 2016; Khoo, 2014). According to Osatuyi (2013), social media is vital in sharing information and conveys different types of information, which could be sensational, political, sensitive, or casual. Information shared through social media is real-time; hence, the information sought in social media consists of the most recent and up-to-date information.

Researchers have argued that the reasons for seeking information through such platforms are diverse (Lin and Lu, 2011; Osatuyi, 2013; Whiting and Williams, 2013). These reasons include social interaction, information seeking, passing the time, entertainment, relaxation, expression of opinion, information sharing, and surveillance/knowledge about others.

As stated earlier in this study, mobile-phone users interact with members of their social network(s) to seek information/advice/help. Researcher Wilson (1999) argues that information seeking arises from the need perceived by information users. Hamid et al. (2015) posit that a person or a system is required to fulfill this need. In their study, Hamid et al. (2015) argue that social media is an information source that is being used daily. It is vital in delivering different types of content on health, education, culture, institutions, and teachers.

Researchers have also indicated that mobile phones are central in providing entertainment to their users (Akanferi et al., 2014; Smith, 2011). Most mobile-phone users listen to music, watch videos, and perform mobile gaming activities. For example, Akanferi et al. (2014) point out that the youth's increased use of mobile-phone for entertainment purposes in Ghana. Simultaneously, the mobile-phone is used today in building social relations (Wei & Lo, 2006). The mobile-phone keeps people in touch with their social network-members of friends and peers through messaging and social platforms such as WhatsApp, Twitter, and Facebook. Through these networks, individuals, especially the youth, talk and share common interests such as music, movies, and mobile gaming.

Furthermore, these networks can influence those who seek advice and information from their social networks to adopt entertainment through their shared subjects of interest. According to Kuss and Griffiths (2011), today, individuals find hours of enjoyment in sharing thoughts, pictures, and videos in the context of building a network of friends. They further point out that sharing thoughts, pictures, and videos becomes the vehicle for connection building with others. This study's results, therefore, corroborate other studies that have found that advice-seeking influences the adoption of m-commerce activities. Therefore, it is not surprising that this study found that advice-seeking had a statistically significant positive influence on m-commerce activities.

6.4.1.2. Advice-giving and m-commerce activities adoption

This study used advice-giving to measure how mobile-phone users gave information, advice, or help to others in their social network(s). In addition, a relationship between the advice-giving and the m-commerce activities was analyzed.

The results from PLS-SEM in Table 30 revealed that the advice-giving was found to have a statistically non-significant influence ($\beta = 0.036$, $p = 0.230$) on the m-commerce activities. Hence, hypothesis 16: *Advice-giving of mobile-phone users in a social network(s) positively influences the adoption of m-commerce activities* is not supported by the study data. In this case, the adoption of m-commerce activities is not influenced by one's ability to provide information/advice/help in a social network.

According to Rogers (2003), there are individuals whom others reach out to for information, advice, or help in a social system. These individuals possess technical competency and social accessibility. Compared to other social system members, they are more exposed to all forms of external communication, are more cosmopolitan, have higher social status, and are more innovative. A striking characteristic of these individuals is their unique and influential position in a social system's communication structure; they are at the center of the interpersonal communication network. Researchers have argued that social networks are often vital information sources about new products (Rogers 2003; Manchanda et al. 2008; Iyengar et al. 2011; Conley & Udry 2016). Cosmas and Sheth (1980) have argued that an opinion leader is someone whose opinions are highly respected and utilized by the respondents to help decide various situations. These opinions include, for example, what clothes to wear, where to have major household items repaired, how to discipline children, and for whom to vote in political elections. These people can be anyone with whom the respondents have personal contacts (a friend, priest, member of a social group, relative, or someone in public life whose advice is derived from his/her public statements).

Conversely, Berelson and Steiner (1964) described opinion leaders as trusted and informed people in virtually all primary groups. They are models for opinions in their group who listen and read for information from the media and then pass on information to influence their circle of relatives, friends, and acquaintances. Also, Katz and Lazarsfeld (1955) argue that opinion leaders have been seen as mediators between mass media and mass audiences.

As described earlier in this study, social media applications such as WhatsApp, Twitter, Telegram, Instagram, and Facebook are technologies rapidly being used for content delivery. Mobile-phone users who give information, help, or advice in their social network would have adopted these technologies ahead of others to access external information and stay informed of what is happening around them. They are expected to be the early adopters of technology. They listen to and read from the media and then pass on the information and influence others in their circle of relatives, friends, and acquaintances. According to Rogers (2003), individuals with a higher degree of opinion leadership in a social system are among the early adopters of technology.

As described above, mobile-phone users who give information, advice, or help in a social system are seen as opinion leaders. As opinion leaders, they tend to be early adopters of technology to stay ahead of other social system members. They can encourage others to adopt or not to adopt a technology (Rogers, 2003). The present study found that advice-giving did not influence the adoption of m-commerce activities. Those seen as opinion leaders in a social network are relatively few, and this group of individuals may already have adopted technologies such as m-commerce activities.

Similarly, opinion leaders and early adopters of technology stay ahead of other social system members. As a distinct feature of early adopters, according to Rogers (2003), they play a crucial role as opinion leaders. In addition, they have a higher social status, a higher level of education, and, frequently, a higher income compared to others in a social network.

With advances made in delivering content in Kenya through mobile-phones, it is expected that the users in a social network(s) who look for advice, information, or help will be influenced toward adopting the m-commerce activities. However, findings from this study revealed that advice-giving of a mobile-phone user in a social network, thus seen as opinion leaders in their social network(s), are not likely to be influenced to adopt m-commerce activities. This study's findings are somewhat surprising. A possible explanation could be that mobile-phone users involved in advice-giving in a social network(s) may have adopted the m-commerce activities.

The section above discussed the findings of the relationship between mobile-phone users' social network-member role and the adoption of m-commerce activities. This study postulated that

when individuals create a social network(s), they consider factors related to their surroundings. In addition, they also consider interactions with other people in their network of family, friends, colleagues, and other close people. Therefore, there is advice-seeking during interactions in a social network(s), and at the same time, advice-giving is provided by opinion leadership in a social network(s). This study's findings revealed that advice-seeking had a statistically significant positive influence on m-commerce activities, while advice-giving did not influence the adoption of m-commerce activities.

To answer this study's research question, "*What influence does the social network-member role of a mobile-phone user have on the adoption of m-commerce activities?*" This study found that mobile-phone users' social network-member role influences them towards adopting m-commerce activities through advice-seeking in one social network(s).

6.5. Overview of the Findings

This study contributes to our understanding of mobile-phone users' roles in adopting m-commerce activities. Mobile-phone users play the technology-user, consumer role, and social network-member role, and these roles potentially influence the adoption of m-commerce activities. Based on the results presented in this study, 38.2% of the variance in m-commerce activities was explained by the predictors (i.e., technology-user, consumer, and social network-member) in this study's research model. Thus, this means that the predictors identified in this study's model could not account for 61.8% of the variance m-commerce activities. These were accounted for by other factors not included in the present study's model.

6.6. Chapter Summary

This chapter presented an interpretation of the study's results and discussions around the findings. This next chapter provides the study's conclusion.

CHAPTER SEVEN: CONCLUSION, RESEARCH CONTRIBUTIONS, LIMITATIONS, AND FUTURE RESEARCH

7.1 Introduction

The previous section presented a discussion of the current study's research findings. Based on these results, this section presents the study's conclusion. The subsequent section presents this study's research contribution, followed by limitations of the study and suggestions for future research to close the chapter.

As discussed earlier, this study focuses on the roles mobile-phone users play – as technology-users, consumers, and social network-members (Chi, 2018; Rajabion, 2015, Huo et al., 2011; AlHinai et al., 2007). Focusing on these roles in their day-to-day activities will help us better understand and explain the adoption of m-commerce activities. Therefore, it is essential to understand mobile-phone users from the perspective of these three roles and how they influence the adoption of m-commerce activities. This study identifies mobile-phone users' m-commerce activities: content delivery, transactions, and entertainment (Chang & Chong, 2013; Chong et al., 2012; Rahman, 2013; Ngai & Gunasekaran, 2007). This chapter also fulfills the aims of this study by responding to the study's research questions (RQs). These include:

1. What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?
2. What influence does the technology-user role of a mobile-phone user have on the adoption of m-commerce activities?
3. What influence does the social network-member role of a mobile-phone user have on the adoption of m-commerce activities?

The study's primary objective was to identify the factors influencing mobile-phone users toward adopting m-commerce activities. A literature review revealed that mobile-phone users play the technology-user, consumer, and social network-member roles. Information systems literature and literature from extant fields, marketing, and social networks provided constructs that informed the study's research model. The constructs were operationalized and postulated to have relationships. From the study's research model, hypotheses were formulated. A cross-sectional

survey study was then designed, followed by a questionnaire to collect data to test the proposed study's hypothesis and answer the study's research questions. Finally, multivariate quantitative methods were applied to analyze the relationship between the dependent and independent variables. Therefore, the following section presents a conclusion of this study's findings to answer the research questions posed.

7.2 Conclusion

The present study concludes that, in general, mobile-phone users' roles (i.e., the technology-use role, the consumer role, and the social network-member role) have a significant influence on the adoption of m-commerce activities.

This study further posed the first research question: *What influence does the technology-user role of a mobile-phone user have on the adoption of m-commerce activities?* This study postulated that mobile-phone users are technology-users, and in their daily activities, they will find mobile phones easy to use and useful. Furthermore, the study findings revealed that these two factors, perceived easy-to-use, and perceived usefulness, influenced m-commerce activities adoption. This study, therefore, concludes that the technology-user role of mobile-phone users influences the adoption of m-commerce activities.

This study posed the second research question: *What influence does the consumer role of a mobile-phone user have on the adoption of m-commerce activities?* The study further hypothesized that mobile-phone users are consumers, and in their day-to-day activities, they make m-payments and make purchase-related decisions. In addition, the findings revealed that the consumer role of a mobile-phone user influences the adoption of m-commerce activities. This influence was through making m-payments and making purchase-related decisions. In making purchase-related decisions, consumer decision-making trait – brand-conscious was found to influence the adoption of m-commerce activities. At the same time, m-payment perceived usefulness influenced the adoption of m-commerce activities. Therefore, this study concludes that the consumer role of mobile-phone users influences the adoption of m-commerce activities.

Furthermore, this study posed the third research question: *What influence does the social network-member role of a mobile-phone user have on the adoption of m-commerce activities?* This study argued that there are advice-seeking and advice-giving in mobile-phone users' social

network(s) circles. The study findings revealed that the advice-seeking of a mobile-phone user in a social network(s) influences the adoption of m-commerce activities. This study, therefore, underscores the importance of advice-seeking in one's social network and concludes that the social network-member role of mobile-phone users influences the adoption of m-commerce activities.

7.3 Research contribution

This section details the study's theoretical and practical contributions to the research findings discussed in Chapter Six. The section is divided into two sub-sections addressing contribution to theory and practice.

7.3.1 Theoretical contribution

Both theory and empirical findings contribute to our understanding of a phenomenon. For example, Corley and Gioia (2011) draw on Sutton and Staw's (1995) definition of "theory" as a statement of concepts and their interrelationships that shows how and why a phenomenon occurs. Likewise, Ågerfalk (2014) argues that theoretical contribution advances our understanding of such concepts and interrelationships.

This research study contributes to theory in the IS field in several ways. This research addresses the knowledge gap in the m-commerce adoption in developing economies' literature. First, technology adoption studies have previously not considered technology users as consumers. Most IS adoption studies have by and large been done from the organizational perspective. Users of technology in the organization did not incur the cost of using the technology, and the organization bore the cost. Many m-commerce adoption studies also considered individuals using a technology as technology users and have not considered them as consumers, as depicted in Appendix C - I. This study contributes to the dearth of studies addressing individuals as consumers. Hence, adopters of m-commerce and related activities play the consumer role – which is a new perspective in m-commerce research

Second, Venkatesh and Brown (2001) pioneered technology adoption outside the workplace, and since then, many more studies have progressed on individual technology adoption. While there are several studies on m-commerce adoption, many have addressed organizations, SMEs, and SMMEs. In addition, many studies addressing m-commerce adoption by individuals have been

done in developed economies. This study found a dearth of studies addressing m-commerce adoption by individuals in developing economies (see Appendix C - I). This study, therefore, contributes to the IS knowledge gap concerning m-commerce adoption by individuals in developing economies.

Third, the m-commerce literature review shows that studies have incorporated individuals' social perspectives and borrowed constructs such as subjective norms from TPB (Chong, 2013; Bhatti, 2007; Wei et al., 2009). Subjective norms consider an individual's perception about a particular behavior, which is influenced by the judgment of significant others (for instance, parents, spouse, friends, and teachers). However, these studies have not addressed individuals' social network(s). A social network comprises sets of actors, dyadic ties, and other social interactions between actors (Wasserman & Faust, 1994). According to Wasserman and Faust (1994), a relationship between a pair of actors establishes a tie between actors, and ties exist between only specific pairs of actors and, therefore, social ties connect actors. Familiar relationships between actors include communication, friendship choices, advice, help, trust, influence, and exchange relationships (Stockman, 2001). In addition, Advice-seeking and advice-giving are essential in individuals' social network(s). Empirically, this study has shown that an individual's social network(s) through advice-seeking influences m-commerce activities adoption. Hence, this study has broadened our understanding of the importance of the social network-member role in m-commerce activities.

Fourth, this research adds to the limited quantitative studies on the adoption of m-commerce related activities – transactions, entertainment, and content delivery in developing economies. Most m-commerce adoption studies focusing on economies that are not developed have been done from the general perspective, which has looked at whether individuals have adopted m-commerce or not. Except for Cullen and Kabanda (2018); Pandey and Chawla (2019); Chong (2013); Chan and Chong (2013), this study did not find any other empirical studies that have distinguished between the various m-commerce activities such as content delivery, transactions, and entertainment in their research. Various m-commerce activities are adopted differently by users and, hence, not distinguishing between them can impact our understanding of how the various m-commerce activities are adopted

This study contributes to our understanding of how mobile-phone users can be influenced to adopt m-commerce activities through their roles as technology-user, a consumer, and a social network-member. Therefore, the significant theoretical contribution of this study is that it has advanced our understanding of m-commerce activities adoption – that is, content delivery, entertainment, and transactions – from the perspective of the roles mobile-phone users play. Integrating these roles in this study makes a significant, value-added contribution to the current thinking on how individuals adopt m-commerce activities. The study also proposed an integrated m-commerce activities adoption model and has empirically validated the model.

7.3.2 Practical Contribution

To the researcher's knowledge, this is one of the few empirical studies to examine the relationship between the roles played by mobile-phone users (i.e., technology-users role, consumer role, and social network-member role) with m-commerce activities adoption in a developing economy - Kenya. The m-commerce market in Kenya is still emerging, and a study on the influence of the roles played by mobile-phone users towards adopting m-commerce activities, therefore, is timely. In addition, the findings of this study provide several practical contributions.

First, this study underscores the importance of the consumer role of a mobile-phone user in m-commerce activities adoption. The consumer role of a mobile-phone user is a new perspective in m-commerce research. As such, understanding the changing role of a mobile-phone user from the consumer perspective is important. Researchers Nohria and Leestma (2001) argue that there is a need to understand consumer behavior to realize the promise of m-commerce deeply. With a profound understanding of the mobile-phone user as a consumer, significant opportunities arise for telecommunications services providers and organizations. They will have a rich and thorough knowledge of mobile-phone user consumer behavior regarding m-commerce activities adoption.

Consumer behavior scholars argue that what constitutes the fundamental source that provides the requirements to the organization concerning the development of marketing strategies is the consumer (Schiffman & Kanuk, 2000; Kotler, 2000). Also, along the same lines, Green et al. (2001) state that the behavior of the mobile consumer is vital to understanding technological innovation and diffusion processes. Therefore, the opportunities in m-commerce abound for firms that thoroughly understand how specific consumers can benefit from them. Many

researchers have identified the need to conduct extensive consumer behavior research in m-commerce to identify business opportunities, effectively meet customer needs, and gain competitive advantage (Barnes, 2002; Green et al., 2000). This study's findings revealed that the consumer role of a mobile-phone user influences the adoption of m-commerce activities through m-payments activities and decision-making styles. One consumer decision-making trait characterized mobile-phone users in this study, i.e., Brand-conscious. This consumer decision-making trait was found to influence mobile-phone users towards adopting m-commerce activities. Literature shows that an individual can possess one or more of these traits, and some individuals can have two dominant styles that drive their purchase decision-making (Sproles & Kendal, 1986). Understanding individuals' traits can help marketers determine how to position products and services on m-commerce activities platforms. For example, new fashion trends can be marketed through entertainment media to capture habitual/loyal-conscious consumers.

Literature supports the importance of m-payments in the adoption of m-commerce (Yang et al., 2012). To encourage more users to adopt m-commerce activities, developers and m-commerce providers need to consider taking advantage of the usefulness of m-payments in making payments for m-commerce activities by providing a seamless integration of m-payments into the services. For example, according to the Consultative Group to Assist the Poor (CGAP) 2017 report, m-payments providers in China created a seemingly endless list of use cases that linked m-payments to various consumption or bill payment services (CGAP, 2017). The use case included taxi-hailing and grocery delivery, utility and credit card payments, booking of wedding venues, and financial products investments, among many others - driven by convenience and need-based services for urban Chinese users. In Kenya, m-payments are at the early stages of integration into the m-commerce activities platforms for payments. As it is currently, users have to move in and out of different applications to complete a payment transaction. Businesses and application developers need to provide seamless integration of m-payments into the m-commerce activities platforms to allow for convenience and efficiency while performing m-commerce activities, thus reducing the time required to complete transactions.

Second, from the study's findings, an individual's social network (s) influence m-commerce activities adoption. From this study's findings, advice-seeking of mobile-phone users in a social network influenced m-commerce activities adoption. Thus, m-commerce providers can formulate

strategies that promote m-commerce activities through informal seminars and individuals' social network(s), and word-of-mouth (Chong et al., 2013; Wei et al., 2009). Marketers can formulate strategies to use mobile-phone users' social networks to promote m-commerce activities adoption.

Third, this study argues that individuals involved in m-commerce activities may not be captured from a general perspective. Studying m-commerce adoption from a general point of view does not give insights into types of m-commerce activities; thus, the importance of understanding individuals' use and adoption patterns of different m-commerce activities. Therefore, understanding individuals' m-commerce adoption patterns concerning the types of m-commerce activities - entertainment, transactions, and content delivery - is important. As such, m-commerce providers and developers can formulate specific strategies and develop applications based on the appropriate m-commerce activities individuals are involved in rather than from a general perspective.

7.4 Study limitations

All research studies have limitations, and this study is no different. The following section discusses these limitations.

Technology has changed since this study was designed and data collected. By then, m-commerce in Kenya was still in its infancy and not as developed today. Most of the transactions were done using basic/feature phone SMS and USSD session. At the time of the study design and data collection, much of the mobile-phones financial activities were mobile money transfer services. Many individuals used mobile-phones as a wallet for savings and still are, given that they were excluded from mainstream banking services. Payment for goods and services at the time of study design and data collection was not as established as today's level. Payments were made by sending money to personal mobile numbers. Many advances have been made regarding mobile money transfer, m-payments, and m-banking. For example, mobile-phones are linked to bank accounts, and the transfer of money back and forth between the bank and phone is seamless. More merchants are also readily accepting mobile payments. Further, smartphones are replacing basic/feature phones and connecting to the internet using 3G/4G networks, accessing various applications developed to provide information and entertainment and perform various other transactions. These new developments may not be captured in this study.

The study collected data using a cross-sectional approach. Cross-sectional data are collected at a single point in time (Blaikie, 2010). According to Blaikie (2010), this type of study does not capture changes in social processes and social change over a while. Individuals' behavior, values, and beliefs change over time as users continue interacting with technology and new technological developments are unveiled. For example, an individual's behavior is not static. It is ever-changing, including attitudes, values, and beliefs. Also, social organizations and groups change as time progresses. Therefore, a cross-sectional study will not capture the differences in users' changing behavior, values, and beliefs over time. Individuals' adoption behavior will change as time progresses, and a cross-sectional study, according to Blaikie (2010), is not ideal for explaining such changes.

The target population for this study was all registered mobile-phone users in Nairobi County. Nairobi County was chosen as a site for data collection because it is the country's economic hub and has a cosmopolitan population with a population of 4.39 million people as per the 2019 census (KNBS, 2019). The study sampled a cross-section of mobile-phone subscribers and distributed 500 questionnaires see Appendix A. While Nairobi may have been chosen to represent the country's social-economic strata, it may not be an actual representation. As a result, it may not portray an accurate picture of the country. For example, the Kenya Economic Report of 2013 shows that the poor in rural areas remain poorer, with much lower incomes than the poverty line (KIPPRA, 2013).

Moreover, according to the report, their income distribution has not changed much over the years. The rich, on the other hand, have retained their riches, thus widening the poverty gap. Also, comparing the rural and urban poor, the average degree of inequality is the same at 10% between the years 2008 to 2012.

Segmenting individuals by demographic profiles helps researchers understand their interaction with m-commerce activities (Chan & Chong (2013). In the past, users' demographics have been used to examine the adoption of technologies such as computers and the internet, among many others (Hernandez, 2011; Dwivedi & Lal, 2007; Cutler et al., 2003). For example, according to Teo (2001), few studies have investigated the direct relationship between individuals' demographics and technology usage. Instead, most studies have looked at the indirect association of demographics to usage. This study collected user demographics and used them to report

descriptive statistics. However, the study did not use mobile-phone users' demographics to understand their influence on m-commerce activities adoption. Neither did it use the demographics as a moderator between mobile-phone users' roles and m-commerce activities adoption.

This study recognizes that m-commerce activities are categorized into transactions, content delivery, and entertainment. Researchers have shown that m-commerce is used for various activities such as making business and financial transactions, entertainment, information and product seeking, location-based services, and mobile advertising (Cullen & Kabanda; 2018; Kalinic & Marinkovic, 2016; Rahman, 2013; Chong, 2013). Thus, the need to more broadly understand how users adopt particular m-commerce activities. In addition, understanding how individuals adopt each of these activities will be necessary. This study did not look at the adoption of each of these specific m-commerce activities. However, researchers have indicated that individuals adopt them for various reasons.

Despite the above limitations, the study gives an understanding of m-commerce activities adoption. These insights will be helpful for researchers and practitioners in the IS field.

7.5 Future Work Direction

This study uncovered several recommendations for future studies.

- i. Future studies could validate this study's empirical model to understand a broader range of m-commerce activities adopters. More individuals have presently adopted m-commerce activities in Kenya. However, only respondents from the capital city of Nairobi were sampled. Therefore, it would be essential to capture and examine a larger sample to include rural areas and compare them with their urban counterparts.
- ii. Researchers can test the study's empirical model in other developing regions. Studies have shown that determinants of m-commerce activities adoption might differ in importance for different regions. Also, subtle and cultural differences may be unique to a particular region. It is therefore imperative to replicate this study in different developing regions.
- iii. Future studies can employ other approaches in investigating m-commerce activities adoption. For example, the positivist approach employed in this study enabled the discovery

of the underlying laws of causation governing the adoption of m-commerce activities. However, an interpretivist or critical realist approach will aid the advancement of this discovery by providing deeper insights into why individuals place certain beliefs, values, and behavior above others in m-commerce activities adoption. In addition, also, how human actions could be caused or influenced by historical and contextual conditions to adopt m-commerce activities.

- iv. In future studies, a longitudinal approach is needed to investigate the adoption of m-commerce activities. Adopting a cross-sectional method in this study does not capture social processes and social changes over a while. Also, an individual's behavior, values, and beliefs are ever-changing. A longitudinal study will be able to capture these changes over time.
- v. Future studies should examine how mobile-phone users' roles (i.e., technology user, transactions, and social network-member) specifically influence m-commerce activities adoption: content delivery, transactions, and entertainment. Further data analysis in this study revealed that mobile-phone users' roles influence the adoption of m-commerce activities differently.
- vi. Future studies should also examine users' demographics' influence on m-commerce activities. Further data analysis in this study indicated that demographics directly influence m-commerce activities.

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Appendices

Appendix A



30th October, 2015

Department of Information Systems
University of Cape Town
Private Bag,
Rondebosch, 7701
South Africa

Dear Sir/Madam,

Re: Survey on M-commerce Adoption in Kenya

My name is Philip Machoka, a Ph.D. student at the University of Cape Town. I am conducting a survey on m-commerce adoption in Kenya as part of my studies. The Commerce Faculty Ethics has approved this research in Research Committee. I would like you to spend about 10 -15 minutes of your time responding to the attached questionnaire and return it to me as soon as possible. The information you give in this questionnaire will be treated with the utmost confidentiality and will be used for academic purposes only. You will not be requested to provide any identifiable information, ensuring the anonymity of your responses. Participation in this survey is voluntary, and you can withdraw from this research anytime.

I am willing to share a summary of the findings of this study with you on request, and should you have any questions with regards to this research, please feel free to contact me at your earliest convenience at 0722 524706 or pmachoka@usiu.ac.ke

I thank you in advance.

Yours sincerely,
Philip Machoka

Appendix B

M-commerce Activities Adoption Questionnaire

A. Demographic Data

(Please tick the appropriate response)

Gender: Male Female

Age: 18 yrs - 25 yrs 26yrs - 40 yrs 41 yrs - 55yr 56 yrs and above

Highest level of Education: Primary School Secondary school College University

Income: Below Ksh 20,000 Ksh 20,000 - 49,999 Ksh 50,000 - 99,999 Ksh 100,000 and above

B. M-commerce Adoption

M-commerce activities:

Please indicate your level of agreement in engaging in the following m-commerce activities through a mobile phone.

Please tick (✓) the appropriate response

Content delivery:					
CD 1: I find it easy to search for specific information using a mobile phone	1	2	3	4	5
CD 2: I prefer to send or receive emails using the mobile phone	1	2	3	4	5
CD 3: I prefer to read and receive news (<i>subscription service or browsing</i>) using the mobile phone	1	2	3	4	5
CD 4: I use directory services (e.g. <i>Google search, Yellow pages etc.</i>) using a mobile phone.	1	2	3	4	5
CD 5: I use internet search engines (e.g. <i>Yahoo, Google, Lycos etc.</i>) using a mobile phone	1	2	3	4	5
Transactions:					
T 1: I prefer to perform routine banking services (<i>pay bills, check account balance etc.</i>) using a mobile phone	1	2	3	4	5
T 2: I prefer to transfer money using a mobile phone	1	2	3	4	5
T 3: I prefer to issue electronic payments (e.g. <i>paybill, till number</i>) in physical shops using a mobile-phone	1	2	3	4	5
T 4: I prefer to conduct advanced banking services (e.g. <i>loan request –e.g. mshwari</i>) using a mobile-phone	1	2	3	4	5
Entertainment:					
E 1: I prefer to play interactive internet games online using a mobile phone	1	2	3	4	5
E 2: I prefer to listen to music from the internet using a mobile phone	1	2	3	4	5
E 3: I prefer to watch videos from the internet using a mobile phone	1	2	3	4	5

C. Technology-user Role

Mobile Phone Beliefs:

Please indicate your level of agreement with the following statements.

M-commerce activities are content delivery, transactions, or entertainment carried out through a mobile phone.

Please tick (✓) the appropriate response

Perceived ease-of-use of mobile phone:					
EU 1: My interaction with mobile phone is clear and understandable to perform m-commerce activities	1	2	3	4	5
EU 2: Interacting with mobile phone for m-commerce activities does not require a lot of my mental effort	1	2	3	4	5
EU 3: I find it easy to get the mobile phone to do what I want to do for my m-commerce activities	1	2	3	4	5
EU 4: Overall, I find mobile phone easy to use for m-commerce activities	1	2	3	4	5
Perceived usefulness of mobile phone					
U 1: Use of mobile phone decreases the time needed for my m-commerce activities	1	2	3	4	5
U 2: Use of mobile phone for m-commerce activities significantly increases the quality of my life	1	2	3	4	5
U 3: Use of mobile phone increases the effectiveness of my m-commerce activity performance	1	2	3	4	5
U 4: Use of mobile phone for m-commerce activity increases my output for the same amount of effort on such activity without a mobile phone	1	2	3	4	5
U 5: Considering all tasks, the use of mobile phone assists my m-commerce activities	1	2	3	4	5
U 6: Overall, I find mobile phone useful in my daily life	1	2	3	4	5
Trust:					
T 1: I do not believe that use of mobile phones for m-commerce activities is secure	1	2	3	4	5
T 2: Information on my mobile phone is at risk if I engage in m-commerce activities	1	2	3	4	5
T 3: I am concerned about the possible security and privacy risks involved in using mobile phones for m-commerce activities	1	2	3	4	5
Cost:					
C 1: Mobile phone with m-commerce capability is expensive	1	2	3	4	5
C2: Mobile phone data bundles subscription is too expensive	1	2	3	4	5
C3: M-commerce activities transactions are costly	1	2	3	4	5
C4: I will not perform m-commerce activities because of its cost	1	2	3	4	5
C5: I prefer to spend money on other entertainments instead of m-commerce activities	1	2	3	4	5

D. Consumer Role

M-payments for Goods and Services:

Please indicate your level of agreement with the following statements

M-commerce activities are *content delivery, transactions, or entertainment* carried out through a mobile phone.

Please tick (✓) the appropriate response

M-payment Perceived usefulness:					
UMP 1: M-payment services are a useful mode of payment for mobile transactions purchases	1	2	3	4	5
UMP 2: Using m-payment services makes the handling of mobile transactions payments easier for me	1	2	3	4	5
UMP 3: M-payment services allow for a faster usage of m-commerce applications (e.g., <i>send money, pay bills, purchase ticket</i>)	1	2	3	4	5
UMP 4: By using m-payment services, my choices as a consumer are improved (e.g., <i>flexibility, speed, convenience</i>)	1	2	3	4	5
M-payment Perceived Ease-of-use:					
EUP 1: It is easy to master the use of m-payment services for m-commerce activities	1	2	3	4	5
EUP 2: The interaction with m-payment services is clear and understandable for m-commerce activities	1	2	3	4	5
EUP 3: It is easy to perform the steps required to use m-payment services for m-commerce activities	1	2	3	4	5
EUP 4: It is easy to interact with m-payment services	1	2	3	4	5

Consumer Decision-Making Styles:

Please indicate your level of agreement with the following statements.

Please tick (✓) the appropriate response

Perfection-Conscious Customer:					
PCC 1: Getting very good quality of products is very important to me	1	2	3	4	5
PCC 2: When purchasing products, I try to get the very best or perfect choice	1	2	3	4	5
PCC 3: In general, I try to get the best overall quality	1	2	3	4	5
PCC 4: I make special effort to choose the very best quality products	1	2	3	4	5
PCC 5: My standards and expectations for products I buy are very high	1	2	3	4	5
PCC 6: A product doesn't have to be exactly what I want, or the best on the market to satisfy me	1	2	3	4	5
Brand-Conscious Customer:					
BCC 1: I usually buy well-known brands/products	1	2	3	4	5
BCC 2: I usually buy the more expensive brands/products	1	2	3	4	5

BCC 3: The higher the price of the product, the better its quality	1	2	3	4	5
BCC 4: Specialty shops offer the best product	1	2	3	4	5
BCC 5: I prefer buying the best-selling brands/product	1	2	3	4	5
BCC 6: The most advertised brands/products are usually good choices	1	2	3	4	5
BCC 7: A product doesn't have to be perfect, or the best, to satisfy me	1	2	3	4	5
Novelty/Variety-Conscious Customer:					
NVC 1: I usually have at least one outfit of the newest style	1	2	3	4	5
NVC 2: I keep my wardrobe up-to-date with the changing fashions	1	2	3	4	5
NVC 3: Fashionable, attractive styling is very important to me	1	2	3	4	5
NVC 4: To get variety, I shop in different shops and choose different brands	1	2	3	4	5
NVC 5: It is fun to buy something new and exciting	1	2	3	4	5
Recreational Shopping-Conscious Consumer:					
RSC 1: Shopping is not a pleasant activity to me	1	2	3	4	5
RSC 2: Going shopping is one of the most enjoyable activities of my life	1	2	3	4	5
RSC 3: Shopping in different shops is a waste of my time	1	2	3	4	5
RSC 4: I enjoy shopping, just for the fun of it	1	2	3	4	5
RSC 5: I normally shop quickly, buying the first product or brand I find seems good enough	1	2	3	4	5
Price Conscious Consumer:					
PCC 1: I buy as much as possible at sale/offer prices	1	2	3	4	5
PCC 2: I usually buy the lower priced products	1	2	3	4	5
PCC 3: I look carefully to find the best value for my money	1	2	3	4	5
Impulsiveness-Conscious Consumer:					
ICC 1: I should plan my shopping more carefully than I do	1	2	3	4	5
ICC 2: I am impulsive when purchasing	1	2	3	4	5
ICC 3: Often I make careless purchases I later wish I had not.	1	2	3	4	5
ICC 4: I spend little time deciding on the products or brands I buy	1	2	3	4	5
ICC 5: I carefully watch how much I spend on shopping	1	2	3	4	5

Confused-by-Over Choices Customer:					
COC 1: There are so many brands/products to choose from that I often feel confused	1	2	3	4	5
COC 2: Sometimes it's hard to decide which shop to buy from	1	2	3	4	5
COC 3: I get confused by all the information on different products	1	2	3	4	5
COC 4: The more I learn about products, the harder it is seems to choose the best	1	2	3	4	5
Habitual/Loyal Consumer:					
HLC 1: I have favorite brands/products I buy every time	1	2	3	4	5
HLC 2: Once I find a product I like, I buy it regularly	1	2	3	4	5
HLC 3: I go to the same shop each time I shop	1	2	3	4	5
HLC 4: I change brands/products I buy regularly	1	2	3	4	5

E. Social Networks Member Role

Social Interactions:

Please indicate your level of agreement with the following statements.

M-commerce activities are *content delivery, transactions, or entertainment* carried out through a mobile phone.

Please tick (✓) the appropriate response

Advice-seeking:					
GET 1: I readily seek for advice or information from others (<i>kin, close friends, relatives</i>) whenever I have a problem carrying out m-commerce activities	1	2	3	4	5
Get 2: I consider it risky for me to seek for advice or information on m-commerce activities from others (<i>kin, close friends, relatives</i>)	1	2	3	4	5
Get 3: I have been advised before to search for items I required on a mobile platform (<i>e.g. Olx</i>)	1	2	3	4	5
Get 4: Getting information or advice from others (<i>e.g. kin, friends, relatives</i>) gives me confidence to carry out m-commerce activities	1	2	3	4	5
Get 5: Seeking advice or information to carry out m-commerce activities is not important for me	1	2	3	4	5
Get 6: I need information or advice for me to carry out m-commerce activities effectively	1	2	3	4	5
Advice-giving:					
GIV 1: Others (<i>kin, close friends, relatives</i>) readily seek advice or information from me whenever they have problems carrying out m-commerce activities	1	2	3	4	5
GIV 2: I voluntarily offer advice or information to others (<i>kin, close friends, relatives</i>) who approach me for help with m-commerce activities	1	2	3	4	5
GIV 3: Others (<i>kin, close friends, relatives</i>) have not approached me for advice or information when they are carrying out m-commerce activities	1	2	3	4	5
GIV 4: I have advised others (<i>kin, close friends, relatives</i>) to search for or buy things they required on a mobile platform (<i>e.g. Olx</i>)	1	2	3	4	5

Appendix C

Systematic Literature Review Articles

Systematic Literature Review Articles																
Author	Year	Title	Country	Unit of Study	Tech use Rate	Cons Rate	SN Rate	Type of Study	Base theory used	Quantitative	Qualitative	MC Appl	Demographics	Adoption Rate	Stage of MC	
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh	Bangladesh	Individual	✓	✓	-	Empirical	Not Specified	Quantitative	-	General	-	-	-	
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh	Individual	✓	✓	-	Conceptual	Not Specified	-	-	General	-	-	-	
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia	Individual	✓	✓	-	Empirical	TAM/DOI/TPB	Quantitative	-	General	Presented	Low	Infancy	
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates	Student	✓	-	-	Empirical	TPB	Quantitative	-	General	Presented	Low	not stated	
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the	Bangladesh	Individual	✓	-	-	Conceptual	Not Specified	-	Qualitative	General	-	Low and Slow	Early Stages	
Chang et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination	China/Malaysia	Consumer	✓	✓	-	Empirical	TAM/DOI	Quantitative	-	General	Direct	Low and Slow	Early Stages	
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China	Individual	✓	✓	-	Empirical	UTAUT	Quantitative	-	General	Present	Fastest	Growing Stage	
*Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modified	Jordan	Student	✓	-	-	Empirical	UTAUT	Quantitative	-	General	Present	Not stated	Note Stated	
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan	Individual	✓	-	✓	Empirical	TAM/TRA	Quantitative	-	General	-	Low	Not stated	
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan	Consumer	✓	✓	-	Empirical	TAM	Quantitative	-	General	Present	Low	Early Stages	
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia	Individual	✓	-	-	Empirical	TAM	Quantitative	-	MC Application	Present	Low	-	
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa	Consumer	✓	✓	-	Empirical	IDT	Quantitative	-	General	-	Low	Early Stages	
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing countries	-	-	-	-	Conceptual	Not Specified	-	-	-	-	-	-	
Dwivedi et al.	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian consumers	India	Consumer	✓	✓	-	Empirical	TAM	Quantitative	-	General	-	Low	Early Stages	
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India	Student	✓	-	-	Empirical	TPB	Quantitative	-	General	-	Low	Early Stages	
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya	Consumer	✓	✓	✓	Conceptual	TAM/TPB/DOI	-	Qualitative	General	0	Low	Early Stages	
Naqvi & Al-Sihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling Approach	Oman	Individual	✓	-	-	Empirical	TAM	Quantitative	-	General	-	Low	Early Stages	
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh	Individual	✓	✓	-	Empirical	TAM	Quantitative	-	General	-	Low	Early Stages	
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Commerce	China	Individual	✓	✓	-	Empirical	SET	Quantitative	-	General	-	Low	Growth Stage	
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India	Student	✓	✓	✓	Empirical	TAM/UTAUT	Quantitative	-	General	-	Low	Early Stages	
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China	Student	✓	✓	-	Empirical	TAM	Quantitative	-	General	-	-	-	
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India	Individual	✓	✓	-	Empirical	TAM/TPB/TRA	Quantitative	-	General	-	Low	Early stages	
Roy & Moorthi	2016	Technology readiness, perceived ubiquity and M-commerce adoption: the moderating role of	India	Individual	✓	✓	-	Empirical	TAM	Quantitative	-	General	-	Low	Early stages	
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India	Individual	✓	-	-	Empirical	TRA/TAM	Quantitative	-	General	-	Low	Early stages	
*Verkijika	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon	Individual	✓	✓	✓	Empirical	UTAUT2	Quantitative	-	General	-	Low	Early stages	
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon	Consumer	✓	-	-	Empirical	TAM/DOI/TPB	Quantitative	-	General	Present (Mod)	Low	Early stages	
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India	Individual	✓	-	-	Empirical	UTAUT	Quantitative	-	MC Application	Present (dir)	Low	Early stages	
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective: The Case of Jordan	Jordan	Consumer	✓	✓	-	Empirical	TAM	Quantitative	-	General	-	Low	Early stages	
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-commerce	Malaysia	Consumer	✓	-	✓	Empirical	UTAUT	Quantitative	-	General	-	Low	Early stages	
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in South Africa	South Africa	Individual	✓	-	-	Empirical	TAM	Quantitative	-	MC Application	Present (dir)	Low	Early stages	
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan	Individual	✓	-	-	Empirical	UTAUT	Quantitative	-	General	-	Low	Primal Stage	
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan	Individual	✓	-	-	Empirical	UTAUT	Quantitative	-	General	-	Low	Early stages	
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan	Consumer	✓	-	-	Empirical	TAM	Quantitative	-	General	Present	-	-	
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Thailand	Thailand	St. Vendors	✓	✓	✓	Empirical	TAM	Quantitative	-	General	Present	Low	Early stages	
Ding et al.	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh	Bangladesh	Individual	✓	-	✓	Empirical	UTAUT2	Quantitative	-	General	Present	Low	Early stages	
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China	Student	✓	✓	✓	Empirical	TAM	Quantitative	-	General	Present	Low	Early stages	
Ali et al.	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bah	Individual	✓	-	✓	Empirical	Maturity Mod	-	Qualitative	MC Applications	-	-	-	
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Tow	Oman	Consumer	✓	-	-	Empirical	UTAUT2/SERV	Quantitative	-	General	-	Low	Early stages	
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa	Individual	✓	-	-	Empirical	DOI	Quantitative	-	General	-	Low	Early stages	
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroon	Cameroon	Individual	✓	✓	-	Empirical	TAM/UTAUT	Quantitative	-	General	Present (Ctrl V)	Low	Early stages	
Dakduk et al.	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging economy	Ecuador	Individual	✓	-	-	Empirical	UTAUT2	Quantitative	-	General	Present	Low	Early	

Appendix D

Author	Year	Title	Country	Stage of MC	MC Activities usage	Mobile Market	PU	PEO	Trust	Cost	Privacy	Security	Risk	Social Influence	Usability	Attitude Confidence	Perc Attituded		
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh	Bangladesh																
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh				√	√		√			√						
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia	Infancy	Low		√	√	√	√		√		√					
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates	not stated		High											√		
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the S	Bangladesh	Early Stages		High			√	√			√						
Chong et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examinatio	China/Malaysia	Early Stages		High	√	√	√	√				√					
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China	Growing Stag	Low	High			√					√					
*Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modifie	Jordan	Note Stated		High													
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan	Not stated		High	√	√											
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan	Early Stages		High	√	√	√	√	√								
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia			High	√	√					√	√					
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa	Early Stages		High			√	√			√						
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing coun																
Dwivedi et al.	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian consu	India	Early Stages	Not Mentio	High	√	√	√	√									
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India	Early Stages	Not Mentio	High													
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya	Early Stages	Not Mentio	High	√	√	√	√				√					
Naqvi & Al-Shihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling App	Oman	Early Stages	Not Mentio	High	√	√											
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh	Early Stages		High	√	√					√						
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Co	China	Growth Stage	Not Mentio	High	√				√	√					√		
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India	Early Stages	Mentioned	High	√	√	√	√				√					
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China			High	√	√	√					√					
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India	Early stages	Not Mentio	High	√	√	√	√									
Roy & Moorthi	2016	Technology readiness, perceived ubiquity and M-commerce adoption the moderating role of	India	Early stages	Not Mentio	High	√	√	√		√								
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India	Early stages	Not Mentio	High	√	√	√		√						√		
*Verkijika	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon	Early stages	Not Mentio	High								√					
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon	Early stages	Not Mentio	High	√	√	√										
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India	Early stages	Mentioned	High							√	√					
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective:The Case of Jordan	Jordan	Early stages	Not Mentio	High	√	√	√			√							
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-Co	Malaysia	Early stages	Not Mentio	High			√					√					
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in Sou	South Africa	Early stages	Not Mentio	High	√	√											
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan	Primal Stages	Not Mentio	Low			√				√						
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan	Early stages	Not Mentio	Low			√					√					
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan			Mentioned	√	√											
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Tha	Thailand	Early stages	Not Mentio	High	√	√	√										
Ding et al	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh:	Bangladesh	Early stages	Not Mentio	High			√					√					
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China	Early stages	Not Mentio	High			√	√		√							
Ali et al	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bah					√	√			√							
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Towar	Oman	Early stages	Not Mentio	High			√					√					
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa	Early stages	Not Mentio	High		√					√						
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroo	Cameroon	Early stages	Not Mentio	High				√				√					
Oakduk et al	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging econo	Ecuador	Early	Not mentio	High			√			√							
							√		22	23	22	12	4	6	9	14	0	1	2

Appendix E

Author	Year	Title	Country	Value added	Enjoyment	Innovativeness	Social Norm	Subj. Norm	Att. towards Behav	Perc. Behv Cntf	Compatibility	Image	Personalized use of pac	Variety of Services	Technophobia	Mental Intangibility	Impulsive Buying
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Banglade	Bangladesh														
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh														
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia			√		√		√							
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates					√		√							
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the S	Bangladesh														
Chong et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examinatio	China/Malaysia											√			
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China	√	√	√											
*Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modife	Jordan														
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan				√										
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan														
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia		√												
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa								√	√					
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing coun														
Dwivedi et al	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian cons	India		√												
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India					√	√	√							
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya			√				√							
Naqvi & Al-Shihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling Appr	Oman														
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh														
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Co	China	√									√				
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India											√			
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China														√
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India		√	√		√	√	√							
Roy & Moorthi	2016	Technology readiness, perceived ubiquity and M-commerce adoption the moderating role of	India														
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India			√		√									
*Verkijka	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon														
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon														
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India		√	√											
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective:The Case of Jordan	Jordan					√									
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-Co	Malaysia														
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in Sou	South Africa		√												
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan														
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan														
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan	√													
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Tha	Thailand														
Ding et al	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh:	Bangladesh														
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China		√	√	√				√						
Ali et al	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bah					√			√						
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Towar	Oman														
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa					√			√						
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroon	Cameroon											√			
Dakduk et al	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging econc	Ecuador														
				3	7	7	2	8	2	5	4	1	1	3	0	0	1

Appendix F

Author	Year	Title	Country	ES	EAP	TAR	Self Efficacy	Ubiquity	Level of EC Adoption	Price Value	Hedonic Motivation	Facilitating Conditions	Effort Expectancy	Performance Expectancy	Behavioral Intention	Uncertainty Avoidance	Security
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh	Bangladesh														
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh														
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia				√					√					
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates														
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the S	Bangladesh														
Chong et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examinatio	China/Malaysia														
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China									√	√	√			
Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modifie	Jordan														
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan														
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan														
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia														
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa														
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing coun														
Dwivedi et al	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian cons	India														
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India														
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya														
Naqvi & Al-Shihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling App	Oman														
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh														
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Co	China														
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India														
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China	√	√	√											
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India				√	√									
Roy & Moorthi	2016	Technology readiness, perceived ubiquity and M-commerce adoption the moderating role of p	India			√		√									
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India						√								
*Verkijika	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon							√	√	√	√	√			
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon												√	√	
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India									√	√	√			
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective:The Case of Jordan	Jordan														√
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-Co	Malaysia									√	√	√			
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in Sou	South Africa														
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan										√	√	√		
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan										√	√	√		√
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan														
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Tha	Thailand														
Ding et al	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh:	Bangladesh										√	√			
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China														
Ali et al	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bah														
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Towar	Oman				√			√	√	√	√	√			
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa				√					√					
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroon	Cameroon														
Dakduk et al	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging econo	Ecuador									√	√	√			
				1	1	2	4	1	1	2	3	8	8	9	2	2	1

Appendix G

Author	Year	Title	Country	PEBIM	Power Distance	Services Functionality	Review	Social Presence	Perceived Benefit	Perceived Intention	Relative Advantage	Habit	Information Qlty	System Qlty	Service Qlty	Voluntariness	Behav. Intention
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh	Bangladesh														
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh														
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia														
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates														
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the Si	Bangladesh														
Chong et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examinatio	China/Malaysia														
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China														
*Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modifie	Jordan														
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan														
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan														
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia														
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa														
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing coun														
Dwivedi et al	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian consi	India														
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India														
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya														
Naqvi & Al-Shihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling App	Oman														
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh														
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Co	China														
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India														
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China														
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India														
Roy & Moorthi	2016	Technology readiness, perceived ubiquity and M-commerce adoption the moderating role of p	India														
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India														
*Verkijika	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon														
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon														
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India														
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective:The Case of Jordan	Jordan														
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-Co	Malaysia	√													
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in Sou	South Africa														
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan														
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan		√												
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan			√											
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Tha	Thailand				√										
Ding et al	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh: Bangladesh	Bangladesh					√									
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China						√	√							
Ali et al	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bahi								√						
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Towar	Oman									√	√	√	√		
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa								√					√	
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroon	Cameroon														√
Dakduk et al	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging econc	Ecuador									√					
				1	1	1	1	1	1	1	2	2	1	1	1	1	1

Appendix H

Author	Year	Title	Country	Awareness & Knowledge	Convenience	Risk & Fast Info	Attitude towards Use	Exposure	Trial of MC	Communication	Observation	Attitude towards MC	Triability	Analysis	Comments
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh	Bangladesh	√	√									Regression	The paper
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh	√										Regression	
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia				√								Though the
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates					√	√	√	√	√		SEM	Extended p
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the S	Bangladesh											Content Analysis	
Chong et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examinatio	China/Malaysia										√	SEM	
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China											Neural Network	
*Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modifie	Jordan											SEM	Used WAR
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan											SEM	The study o
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan											Regression	All the fact
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia											SEM	a general s
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa												
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing coun												
Dwivedi et al	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian consu	India											Regression	
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India											SEM	attitude an
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya												Using the e
Naqvi & Al-Shihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling App	Oman											Descriptive	Study just
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh												
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Co	China											SEM	the resear
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India											SEM/Neur	The SEM re
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China												
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India											SEM	perceived
Roy & Moorthi	2016	Technology readiness, perceived ubiquity and M-commerce adoption the moderating role of	India											SEM	draw conce
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India											SEM	
*Verkijika	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon												Performan
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon											SEM	Uncertain
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India											Logistic regression	
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective:The Case of Jordan	Jordan											Regression	PEOU, PU
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-Co	Malaysia												Simple corr
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in Sou	South Africa											Regression	age has no
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan											Regression	Our quanti
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan											SEM	effort expe
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan											DEMATEL	
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Tha	Thailand											MANCOVA	Study aime
Ding et al	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh:	Bangladesh											SEM	the factor
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China											SEM-PLS	79.9% of th
Ali et al	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bah												
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Towar	Oman											SEM	UTAUT2 fa
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa											Regression analysis	
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroon	Cameroon											SEM	Social influ
Dakduk et al	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging econo	Ecuador											SEM	
				2	1	0	1	1	1	1	1	1	1		

Appendix I

Author	Year	Title	Country	Journal
Islam et al.	2011	The Adoption of Mobile Commerce Service among Employed Mobile Phone Users in Bangladesh	Bangladesh	International Business Research
Rahman	2011	Factors that affect user adoption on m-commerce in developing countries using the extended	Bangladesh	Proceedings of the 25th Australian and New Zealand Academy of Management International Conference (ANZAM 2011)
Sadi & Noordin	2011	Factors influencing the adoption of M-commerce: An exploratory Analysis	Malaysia	International Conference on Industrial Engineering and Operations Management
Khalifa et al.	2012	Adoption of mobile commerce: a confidence model	Emirates	Journal of Computer Information Systems
Rahman	2013	Barriers to M-commerce Adoption in Developing Countries – A Qualitative Study among the S	Bangladesh	The International Technology Management Review
Chong et al.	2013	Predicting consumer decisions to adopt mobile commerce: Cross country empirical examinatio	China/Malaysia	Decision Support Systems
Chong	2013	Predicting m-commerce adoption determinants: A neural network approach	China	Expert Systems with Applications
*Jaradat & Rababaa	2013	Assessing Key Factor that Influence on the Acceptance of Mobile Commerce Based on Modifie	Jordan	International Journal of Business and Management
Alnajjar et al.	2013	Adoption Factors of m-Commerce in Jordan: From Personal and Societal Norms Perspectives	Jordan	International Journal of Computer Theory and Engineering
Nassuora	2013	Understanding factors affecting the adoption of m-commerce by consumers	Jordan	Journal of Applied Sciences
Chan & Chong	2013	Analysis of the determinants of consumers' m-commerce usage activities	Malaysia	Online Information Review
Joubert & Van Belle	2013	The Role of Trust and Risk in Mobile Commerce Adoption within South Africa	South Africa	International Journal of Business, Humanities and Technology
Nafea & Younas	2014	Improving the Performance and Reliability of Mobile Commerce in Developing Countries	Developing coun	International Conference on Mobile Web and Information Systems
Dwivedi et al	2014	Adoption of M-commerce: examining factors affecting intention and behaviour of Indian consu	India	Int. J. Indian Culture and Business Management
MISHRA	2014	Adoption of M-commerce in India: Applying Theory of Planned Behaviour Model	India	Journal of Internet Banking and Commerce
Gitau & Nzuki	2014	Analysis of Determinants of M-Commerce Adoption by Online Consumers	Kenya	International Journal of Business, Humanities and Technology
Naqvi & Al-Shihi	2014	Factors Affecting M-commerce Adoption in Oman using Technology Acceptance Modeling App	Oman	TEM Journal
Rahman & Sloan	2015	Opportunities and Challenges of M-commerce Adoption in Bangladesh: An Empirical Study	Bangladesh	Journal of Internet Banking and Commerce
Dai & Chen	2015	Effects of Exchange Benefits, Security Concerns and Situational Privacy Concerns on Mobile Co	China	Journal of International Technology and Information Management
Yadav et al.	2015	A multi-analytical approach to understand and predict the mobile commerce adoption	India	Journal of Enterprise Information Management
Ng	2016	Examining factors affecting mobile commerce adoption of Chinese consumers	China	Int. J. Electronic Business
Gangwal & Bansal	2016	Application of Decomposed Theory of Planned Behavior for M-commerce Adoption in India	India	International Conference on Enterprise Information Systems (ICEIS 2016)
Roy & Moorathi	2016	Technology readiness, perceived ubiquity and M-commerce adoption the moderating role of p	India	Journal of Research in Interactive Marketing
Remedios	2017	A Study on the Factors Affecting the Adoption of M-Commerce in India	India	International Journal of Research in Management & Business Studies
*Verkijika	2018	Factors influencing the adoption of mobile commerce applications in Cameroon	Cameroon	Telematics and Informatics
Ntsafack et al.	2018	Exploring Factors Affecting Mobile Services Adoption by Young Consumers in Cameroon	Cameroon	World Conference on Information Systems and Technologies
Pandey & Chawla	2018	Engaging m-commerce adopters in India	India	Journal of Enterprise Information Management
Al-Dwairi et al.	2018	Mobile Commerce Adoption From Consumers Perspective:The Case of Jordan	Jordan	International Journal of Information Systems and Social Change
Sim et al.	2018	Trust in Vendor and Perceived Effectiveness of E-Commerce Institutional Mechanisms in M-Co	Malaysia	2018 8th IEEE International Conference on Control System
Cullen & Kabanda	2018	The role of demographic and motivational factors on mobile commerce usage activities in Sou	South Africa	South African Journal of Information Management
Njenga & Salih	2018	On Trust and Security Risk: Mobile Commerce Acceptance and Readiness in Sudan	Sudan	International Conference on Mobile and Wireless Technology
Chou et al.	2018	Factors influencing the adoption of mobile commerce in Taiwan	Taiwan	Int. J. Mobile Communications
Hsu & Yeh	2018	Understanding the critical factors for successful M-commerce adoption	Taiwan	Int. J. Mobile Communications
Pipitwanichakarn & V	2020	Mobile commerce adoption among the bottom of the pyramid: a case of street vendors in Tha	Thailand	Journal of Science and Technology Policy Management
Ding et al	2019	Influence of Trust and social presence in m-commerce adoption intention in Bangladesh:	Bangladesh	North American Academic Research
Cedeno	2019	Factors determining intention to adopt m-commerce in a group of College students in China	China	International Journal of Innovation and Applied Studies
Ali et al	2019	A process approach to examining mobile commerce adoption progression	Kingdom of Bah	Journal of Systems and Information Technology
Tarhini et al.	2019	An analysis of the factors affecting mobile commerce adoption in developing countries: Towar	Oman	Review of International Business and Strategy
Chinedu & Huisman	2019	THE ADOPTION OF M-COMMERCE APPLICATIONS: RURAL DWELLERS' PERSPECTIVES	South Africa	Conference paper
Dongmo et al.	2020	Mobile Commerce Adoption in a Developing Country: Driving Factors in the Case of Cameroon	Cameroon	Conference: Information and Communication Technologies in Organizations and Society - ICTO2018
Dakduk et al	2020	Acceptance of mobile commerce in low-income consumers: evidence from an emerging econo	Ecuador	Heliyon

Appendix J

Item Code	Measurement Statement	Construct
EU 1:	My interaction with mobile phone is clear and understandable to perform mobile commerce activities	Perceived ease-of-use
EU 2:	Interacting with mobile phone for mobile commerce activities does not require a lot of my mental effort	Perceived ease-of-use
EU 3:	I find it easy to get the mobile phone to do what I want to do for my m-commerce activities	Perceived ease-of-use
EU 4:	Overall, I find mobile phone easy to use for mobile commerce activities	Perceived ease-of-use
U 1:	Use of mobile phone decreases the time needed for my mobile commerce activities	Perceived usefulness
U 2:	Use of mobile phone for mobile commerce activities significantly increases the quality of my life	Perceived usefulness
U 3:	Use of mobile phone increases the effectiveness of my mobile commerce activity performance	Perceived usefulness
U 4:	Use of mobile phone for mobile commerce activity increases my output for the same amount of effort on such activity without a mobile phone	Perceived usefulness
U 5:	Considering all tasks, the use of mobile phone assists my mobile commerce activities	Perceived usefulness
U 6:	Overall, I find mobile phone useful in my daily life	Perceived usefulness
T 1:	I do not believe that use of mobile phones for mobile commerce activities is secure	Trust:
T 2:	Information on my mobile phone is at risk if I engage in mobile commerce activities	Trust:
T 3:	I am concerned about the possible security and privacy risks involved in using mobile phones for mobile commerce activities	Trust:
C 1:	Mobile phone with mobile commerce capability is expensive	Cost:
C2:	Mobile phone data bundles subscription is too expensive	Cost:
C3:	Mobile commerce activities transactions are costly	Cost:
C4:	I will not perform mobile commerce activities because of its cost	Cost:
C5:	I prefer to spend money on other entertainments instead of mobile commerce activities	Cost:
UMP 1:	Mobile payment services are a useful mode of payment for mobile transactions purchases	M-payment Usefulness
UMP 2:	Using mobile payment services makes the handling of mobile transactions payments easier for me	M-payment Usefulness
UMP 3:	Mobile payment services allow for a faster usage of mobile commerce applications (e.g., send money, pay bills, purchase ticket)	M-payment Usefulness
UMP 4:	By using mobile payment services, my choices as a consumer are improved (e.g., flexibility, speed, convenience)	M-payment Usefulness
EUP 1:	It is easy to master the use of mobile payment services for mobile commerce activities	M-Payment ease-of-use
EUP 2:	The interaction with mobile payment services is clear and understandable for mobile commerce activities	M-Payment ease-of-use
EUP 3:	It is easy to perform the steps required to use mobile payment services for mobile commerce activities	M-Payment ease-of-use
EUP 4:	It is easy to interact with mobile payment services	M-Payment ease-of-use
PCC 1:	Getting very good quality of products is very important to me	Perfection-conscious

Item Code	Measurement Statement	Construct
PCC 2:	When purchasing products, I try to get the very best or perfect choice	Perfection-conscious
PCC 3:	In general, I try to get the best overall quality	Perfection-conscious
PCC 4:	I make special effort to choose the very best quality products	Perfection-conscious
PCC 5:	My standards and expectations for products I buy are very high	Perfection-conscious
PCC 6:	A product doesn't have to be exactly what I want, or the best on the market to satisfy me	Perfection-conscious
BCC 1:	I usually buy well-known brands/products	Brand-conscious
BCC 2:	I usually buy the more expensive brands/products	Brand-conscious
BCC 3:	The higher the price of the product, the better its quality	Brand-conscious
BCC 4:	Specialty shops offer the best product	Brand-conscious
BCC 5:	I prefer buying the best-selling brands/product	Brand-conscious
BCC 6:	The most advertised brands/products are usually good choices	Brand-conscious
BCC 7:	A product doesn't have to be perfect, or the best, to satisfy me	Brand-conscious
NVC 1:	I usually have at least one outfit of the newest style	Novelty-Variety-conscious
NVC 2:	I keep my wardrobe up-to-date with the changing fashions	Novelty-Variety-conscious
NVC 3:	Fashionable, attractive styling is very important to me	Novelty-Variety-conscious
NVC 4:	To get variety, I shop in different shops and choose different brands	Novelty-Variety-conscious
NVC 5:	It is fun to buy something new and exciting	Novelty-Variety-conscious
RSC 1:	Shopping is not a pleasant activity to me	Recreational-conscious
RSC 2:	Going shopping is one of the most enjoyable activities of my life	Recreational-conscious
RSC 3:	Shopping in different shops is a waste of my time	Recreational-conscious
RSC 4:	I enjoy shopping, just for the fun of it	Recreational-conscious
RSC 5:	I normally shop quickly, buying the first product or brand I find seems good enough	Recreational-conscious
PCC 1:	I buy as much as possible at sale/offer prices	Price-conscious
PCC 2:	I usually buy the lower priced products	Price-conscious
PCC 3:	I look carefully to find the best value for my money	Price-conscious
ICC 1:	I should plan my shopping more carefully than I do	Impulsive
ICC 2:	I am impulsive when purchasing	Impulsive
ICC 3:	Often I make careless purchases I later wish I had not.	Impulsive
ICC 4:	I spend little time deciding on the products or brands I buy	Impulsive
ICC 5:	I carefully watch how much I spend on shopping	Impulsive
COC 1:	There are so many brands/products to choose from that I often feel confused	Confused-by-over Choices
COC 2:	Sometimes it's hard to decide which shop to buy from	Confused-by-over Choices
COC 3:	I get confused by all the information on different products	Confused-by-over Choices
COC 4:	The more I learn about products, the harder it is seems to choose the best	Confused-by-over Choices
HLC 1:	I have favorite brands/products I buy every time	Habitual/loyal
HLC 2:	Once I find a product I like, I buy it regularly	Habitual/loyal
HLC 3:	I go to the same shop each time I shop	Habitual/loyal
HLC 4:	I change brands/products I buy regularly	Habitual/loyal

Item Code	Measurement Statement	Construct
GET 1:	I readily seek for advice or information from others (kin, close friends, relatives) whenever I have a problem carrying out mobile commerce activities	Advice-seeking
Get 2:	I consider it risky for me to seek for advice or information on mobile commerce activities from others (kin, close friends, relatives)	Advice-seeking
Get 3:	I have been advised before to search for items I required on a mobile platform (e.g. Olx)	Advice-seeking
Get 4:	Getting information or advice from others (e.g. kin, friends, relatives) gives me confidence to carry out mobile commerce activities	Advice-seeking
Get 5:	Seeking advice or information to carry out mobile commerce activities is not important for me	Advice-seeking
Get 6:	I need information or advice for me to carry out mobile commerce activities effectively	Advice-seeking
GIV 1:	Others (kin, close friends, relatives) readily seek advice or information from me whenever they have problems carrying out mobile commerce activities	Advice-giving
GIV 2:	I voluntarily offer advice or information to others (kin, close friends, relatives) who approach me for help with mobile commerce activities	Advice-giving
GIV 3:	Others (kin, close friends, relatives) have not approached me for advice or information when they are carrying out mobile commerce activities	Advice-giving
GIV 4:	I have advised others (kin, close friends, relatives) to search for or buy things they required on a mobile platform (e.g. Olx)	Advice-giving
CD 1:	I find it easy to search for specific information using a mobile phone	Content Delivery
CD 2:	I prefer to send or receive emails using the mobile phone	Content Delivery
CD 3:	I prefer to read and receive news (subscription service or browsing) using the mobile phone	Content Delivery
CD 4:	I use directory services (e.g. Google search, Yellow pages etc.) using a mobile phone.	Content Delivery
CD 5:	I use internet search engines (e.g. Yahoo, Google, Lycos etc.) using a mobile phone	Content Delivery
TX 1:	I prefer to perform routine banking services (pay bills, check account balance etc.) using a mobile phone	Transactions
TX 2:	I prefer to transfer money using a mobile phone	Transactions
TX 3:	I prefer to issue electronic payments (e.g. paybill, till number) in physical shops using a mobile-phone	Transactions
TX 4:	I prefer to conduct advanced banking services (e.g. loan request –e.g. mshwari) using a mobile-phone	Transactions
BE 1:	I prefer to play interactive internet games online using a mobile phone	Entertainment
BE 2:	I prefer to listen to music from the internet using a mobile phone	Entertainment
BE 3:	I prefer to watch videos from the internet using a mobile phone	Entertainment