THE MODERATING EFFECT OF INFORMATION SECURITY ON THE ADOPTION OF MOBILE MARKETING TRANSACTIONS AMONG SOUTH AFRICAN TERTIARY STUDENTS

By

GIFT TARUWANDIRA DONGA
STUDENT NUMBER: 15017562

A Thesis

Submitted for the degree

DOCTOR OF PHILOSOPHY: BUSINESS MANAGEMENT

In the

Department of Business Management

SCHOOL OF MANAGEMENT SCIENCES

UNIVERSITY OF VENDA

Promoter: Prof. A. Kadyamatimba

Co-Promoter: Prof. R. Shambare

May 2020

DECLARATION

I, Gift Donga, hereby declare that this thesis for the Doctor of Philosophy in Business Management (PhDB) submitted to the Department of Business Management at the University of Venda has not been submitted previously for any degree at this or another university. It is original in design and in execution, and all reference material contained therein has been duly acknowledged.

Student  **Date:** 14/07/2020

G. T. Donga

ABSTRACT

Despite the fast pace of development within the mobile commerce industry globally, marketers in developing countries are still lagging in understanding why and how consumers participate in mobile marketing transactions. The literature reporting on mobile marketing transactions' adoption in a South African context remains largely inconsistent and fragmented as most previous studies are based on the experience of consumers in a non-South African (and non-developing country) context. Therefore, this study identifies a literature gap, in that there lacks a sufficient critical mass of studies into the moderating effect of information security on consumer adoption of mobile marketing transactions in South Africa particularly among the youth who have a strong affinity for constant mobile connectivity. Furthermore, confronted with rapid changes in emerging technology, previous models of technology adoption are slowly becoming outmoded. Consequently, this study considered testing a proposed model on the predictive power of marketing-related mobile activity to help improve understanding and prognosis of the adoption of mobile marketing transactions in South Africa. Specifically, in order to render these tests robust, perceived information security was applied as a moderator variable to increase the explanatory power of the model. The objectives set out for this research were measured utilising a single cross-sectional approach, guided by the positivist paradigm. In keeping with the dictates of ensuring the highest levels of reliability and validity, a measuring instrument developed from past studies was used. Using a self-administered questionnaire, data were collected from a sample of 810 students from selected South African universities. Descriptive and multivariate statistical tests including the moderated hierarchical regression analysis were used to analyse data. The implication of the study is that it provides both marketers and policymakers with a set of controllable variables that may be manipulated to promote the adoption of mobile marketing transactions.

Keywords: *Adoption, mobile marketing, South Africa, information security, moderation.*

DEDICATION

I dedicate this doctoral thesis to my parents

ONIAS AND ELIZABETH DONGA

Thank you for your unconditional love,
patience, and support throughout
my studies.

ACKNOWLEDGEMENTS

First and foremost, I would like to thank God Almighty for giving me the strength, knowledge, ability, and opportunity to undertake this study and to persevere and complete it satisfactorily. Without his blessings, this achievement would not have been possible.

I take great pride in acknowledging my promoter, Prof. Armstrong Kadyamatimba for believing in me and being a pillar of support, from my master's studies up to this point. Thank you indeed for sparing your valuable time whenever I approached your busy office for both academic and personal guidance. You gave me all the freedom to pursue my research, while silently and non-obtrusively ensuring that I stay on course and do not deviate from the core of my research.

In my journey towards fulfilling this degree, I have found a mentor, a perpetual source of inspiration and a role model in my co-promoter, Prof. Richard Shambare. You have been there providing your heartfelt support and guidance always. Your constant support and invaluable advice even when you had transferred to Cape Town has always guided me. I sincerely thank you Prof, you helped me to understand various research skills and practices that gave impetus to my research.

I also have great pleasure in extending my gratitude to my colleagues and fellow research scholars from the University of Venda, Dr. Chakuzira, Dr. Kativhu, Mr. Shumba, Mr. Ngirande, and Mr. Zindiye for the constant engagements in robust and sometimes heated academic debates, as well as being there at times when I required motivation. Your support, encouragement, and ideas have been great contributors in the completion of this thesis.

My acknowledgement would be incomplete without thanking the biggest source of my strength, my family. The blessings of my parents and the love and care of my sisters (Loveness and Chengetai) have all made tremendous contribution in helping me reach this stage of my life.

Most importantly, I wish to single out my wife, Dr. Rachel Donga, nee Chinyakata. I thank you for putting up with me in difficult moments where I felt stumped, and for goading me on to follow my dream of getting this degree. This would not have been possible without your unwavering and unselfish love and support at all times.

Lastly, it would be inappropriate if I omit to mention some organisations who all contributed to my overall academic achievements since I began my first year of tertiary education. Much appreciation goes to the National Research Foundation (NRF) and the University of Venda

Research Centre for funding my masters and PhD studies, respectively. Furthermore, I would like to thank the Zimbabwean Presidential Scholarship Board for funding my undergraduate studies, and the Govan Mbeki Research and Development programme for funding my honours studies at the University of Fort Hare.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1. CHAPTER OVERVIEW

This chapter introduces the research by outlining the background to the study by way of a brief literature review, the research gap that was identified in the body of knowledge, and the formulation of the research problem and objectives. Thereafter, the methodology used to answer the research objectives is briefly discussed. Following on, the chapter closes by presenting a synopsis of the structure which the thesis is going to follow.

1.2. INTRODUCTION

Within the last decade, direct marketing channels that convey targeted, relevant, and personalised messages to consumers have developed as a central component to retailers' marketing strategy (Beneke, 2011; Bhatiasevi & Yoopetch, 2015; Persaud & Azhar, 2012; Roach, 2009). Precisely, ubiquitous technologies mediated through hand-held mobile devices, for instance mobile phones and tablets, have proved to be quite successful not only for communicating with consumers, but also for facilitating business-to-consumer (B2C) transactions as well as the consumer-to-consumer (C2C) ones (Fano & Gershman, 2002; Roach, 2009). Incontestably, because of the advances in information and communication technologies (ICTs), a new form of marketing now commonly known as mobile commerce - or simply m-Commerce - was developed.

Unlike previously, today consumers have the option of buying either from physical stores or from online ones. The introduction of fast Internet connections and smartphones, according to Cuadrado and Duenas (2012), has allowed for online shops (e.g., Zando, Takealot.com, and Amazon.com) to substitute physical stores. For instance, consumers even those in remote areas, can now utilise their mobile devices to perform online transactions independent of physical stores. Online stores can now also empower those consumers living in rural and remote areas to access products that they were otherwise unable to acquire because of distance and time restrictions (Smutkupt, Krairit & Esichaikul, 2010). For example, a customer in Tshakuma can now easily

purchase a product from a Dubai-based retailer and receive such product through a courier within a few days. Such is the power of m-Commerce.

More specifically, m-Commerce refers to 'any transactions, either direct or indirect, with a monetary value implemented via a wireless telecommunication network' (Wu & Wang, 2005: 720). Some of the common forms of m-Commerce include mobile banking, mobile marketing, mobile ticketing, mobile investments, mobile shopping, and services (Kurkovsky, 2007). Due to rapid advancements in technology, the concept of m-Commerce and how online transactions are concluded are constantly changing (Chiemeke & Evwiekpaefe, 2011; Meso, Musa & Mbarika, 2005). Furthermore, widespread availability and accessibility of the Internet also means that m-Commerce retailers' barriers to entry are significantly reduced. Low barriers to entry, naturally, translate to increased competitive pressure, which in turn makes retailers' survival in the industry a challenge. To survive, therefore, online store managers strive to keep abreast with the latest technology in general and, more specifically, trending m-Commerce practices.

It goes without saying that for retailers to survive in this highly competitive market, their managers should have in-depth understanding of two m-Commerce dynamics: (1) consumers' decision-making processes, and (2) Internet safety and security issues. In other words, retailers need to understand how consumers take into consideration Internet security when making decisions to use m-Commerce transactions. It is against this background that this study concerns itself with the factors influencing m-Commerce adoption.

1.3. BACKGROUND TO THE STUDY

Regardless of the apparent opportunities which are generated by m-Commerce, complexities in technology and security issues associated with the implementation of mobile marketing transactions have implied that its adoption within the South African marketplace has been relatively slow (Raleting & Nel, 2011). Even though technology influences both product and place utility (Shambare, 2012), Rogers (2003) cautions that making customers to actually make use of technological innovations in the first instance can be problematic. Castronovo and Huang (2012), therefore, suggest that for mobile marketing transactions to remain competitive, these technologies must be recognised by consumers. Chellapa and Pavlou (2002) furthermore argue that information security concerns have always presented some threats towards the adoption of new information technologies, yet no clear evidence has shown any significant association

between information security and the adoption of m-Commerce. In a survey conducted by Business Week (2000), almost 61 per cent of the participants indicated their willingness to engage in mobile marketing transactions if they are proper security and privacy measures aimed at protection of their personal information. Thus, it is consumers' perception of security that would stimulate transacting on the mobile marketing platform (Hayashi, 2012).

Since current research is narrow in its understanding of information security perceptions when performing Internet transactions (Du and Agami, 2017) it is important to establish its influence on the adoption of mobile marketing transactions. Additionally, given the paucity of studies on this topic, debate around the most efficient predictors does not appear to have been exhaustively examined. It is against this background that the purpose of the present research is directed towards further understanding the relative importance of consumer adoption of mobile marketing transactions. Specifically, the study wishes to establish the moderating effects of information security on established antecedents (marketing-related mobile activity) and mobile-marketing transactions adoption (MMTA) among South African university students.

1.3.1. Previous Studies on Mobile Marketing Adoption among Students

A brief appraisal of the relevant literature shows that efforts in research have been directed towards identifying factors influencing adoption of mobile marketing among college students (e.g, Bhatiasevi, 2016; De Marez, Vyncke, Berte, Schuurman & De Moor, 2007; Mallat, 2007; Muk & Babin, 2006; Peng & Spencer, 2006). Table 1.1 gives an overview of some of the studies that have been conducted in relation to m-Commerce adoption among students, and the major findings.

Past studies seem to validate the notion, which has been highlighted earlier, of scarcity in literature related to adoption of technology in developing countries. This scarcity has been said to be influencing the widening of the digital divide. Table 1.1 reveals scantiness of past studies which have been conducted in Africa relating to the adoption of mobile commerce among the student market in particular. However, the information is crucial in identifying a number of important variables influencing the adoption of m-Commerce such as attitude (Beneke, 2011), social influence (Bhatiasevi, 2016), content credibility (Peng & Spencer, 2006), relative advantage (Mallat, 2007), perceived value and trust (Govender & Sihlali, 2014) perceived control (Marti-

Parreno, Sanz-Blas, Ruiz-Mafe, & Aldas-Manzano, 2013), personality, and perception (Shambare, 2012).

Table 1.1: Overview of Findings from Past M-Commerce Studies

Author	Study country and method	Factors observed to have the greatest influence on adoption of m-Commerce
Chowdhury, Parvin, Weitenberner and Becker (2006)	Bangladesh, Field-survey (n=309)	• Credibility of messages
Peng and Spencer (2006)	China, Paper-based survey (n=297)	• content credibility
Rohm and Sultan (2006)	USA and Pakistan, Field-surveys (n=169 in the USA) (n=215 in Pakistan)	• Countries' level of development
De Marez et al. (2007)	Belgium, Field-Survey (n=674)	• Proper targeting
Mallat (2007)	Finland, Focus group (n=47)	• Relative advantage
Wais and Clemons (2008)	USA, Online survey (n=531)	• Source credibility.
Beneke (2011)	South Africa, Field-Survey (n=250)	• Attitudes
Shambare (2012)	South Africa and Zimbabwe, Field-survey (n=778 in Zimbabwe) (n=1042 in SA)	• Personality and perceptions
Govender and Sihlali (2014)	South Africa, Field-survey (n=71)	• Perceived value and trust
Marti Parreno, Sanz-Blas, Ruiz-Mafe and Aldas-Manzano (2013)	Spain, Field-survey(n=355)	• Emotions
Etim (2014)	Nigeria, Mixed method (n=300)	• Technology orientation
Bhatiasevi (2016)	Thailand, Field-Survey (n=579)	• Performance and effort expectancy • societal influence • perceived convenience • professed credibility

Source: Compiled for the study

From analysing the findings from past studies as shown in Table 1.1, one can observe that emphasis has been given more on the common innovation adoption drivers. Few studies (e.g,

Abu-Shanab & Ghaleb, 2012; Androulidakis & Kandus, 2011, Chen, Zhang & Lee, 2013) have explored those unique but significant drivers to the adoption of mobile innovations among tertiary students - such as information security. Thus, this study identified this gap. Besides, most studies on adoption of innovation focus more on non-South African contexts (Makhitha & Dlodlo, 2014; Raleting & Nel, 2011). To increase the explanatory power of innovative marketing adoption models, this study postulates that perceived information security acts as a moderator between established variables and mobile commerce adoption. In particular, information security is proposed to moderate the relationship between marketing-related mobile activity and adoption of mobile-marketing transactions. The concept of mobile-marketing transactions and information security are reviewed in detail in the ensuing chapter, whilst marketing-related mobile activity is discussed in Chapter 3.

1.4. RESEARCH GAP AND FORMULATION OF THE RESEARCH PROBLEM

Despite the fast pace of development within the m-Commerce industry globally, marketers in developing countries are still lagging behind in understanding why and how consumers engage in mobile marketing transactions. The literature pertaining to mobile-marketing transactions adoption in a South African context remains largely inconsistent and fragmented as most previous studies are based on consumers in European and Asian markets (Persuad & Azhar, 2012; Beneke, 2011). This can largely be attributed to the digital divide (Bertot, Jaeger & Grimes, 2010) which has seen more developed nations having the ability (both technical and financial) to make full use of recent available technology when compared to developing countries.

According to Goncalves, Oliveira and Cruz-Jesus (2018) African countries seem to be the worst affected by the digital divide and unless proper measures are implemented globally to narrow this gap, technology adoption in Africa will remain sluggish. Shambare (2014) mentions the high cost of technology in Africa, which has led to widespread technology poverty on the continent, as contributing to the digital divide. This implies that most South African citizens cannot afford information and communication technologies (ICTs), which in turn creates technologically poor consumers. It is crucial to note that technological poverty in Africa is likely to result in a heightened fear of technology amongst South African consumers, which has adverse effects on adoption.

An overlooked factor by most studies on the adoption of m-Commerce which might significantly contribute to fear of technology is perceived information security. Due to the information security

threats surrounding m-Commerce, its adoption in South Africa and regionally has been relatively low. Of concern is the fact that of the five African nations (South Africa, Egypt, Kenya, Tunisia and Botswana) with the highest number of active malicious IP addresses, South Africa has been ranked at the top of the list (Vicente, 2016; Cameron, 2017). As a result, the Cybersecurity and legal experts are warning that an increase in cyberattacks and the pending implementation of the Protection of Personal Information Act (POPIA) of 2013 expose South Africans to increased risk (IT Online, 2020). This imply that even the South African online retail sector is not spared from the risk and in the absence of extensive knowledge with respect to the significant predictors of mobile marketing transactions adoption the costs of mobile marketing campaigns for businesses remains exorbitant. This in turn transfers the cost burden to the majority of South African consumers, thereby inhibiting the bridging of the digital divide. Against this backdrop, the research problem can be stated as follows:

> *While mobile commerce continues to gain momentum as a mainstream way for consumers to transact online, mobile marketing transactions in particular have recently been overshadowed by security panics and m-Commerce's future relies upon information control against security threats as well as improving consumer security sensitivities.*

1.5. AIM OF THE STUDY AND OBJECTIVES

The aim of the study is to test a model of underlying factors influencing adoption of mobile marketing transactions among selected South African university students; specifically, it assesses the role of information security as a moderating variable between marketing-related mobile activity and MMTA.

The research aim will be fulfilled by the following specific objectives:

i. To establish the influence of marketing-related mobile activity on the adoption of mobile marketing transactions.
ii. To assess the role of perceived information security in moderating the relationship between marketing-related mobile activity and adoption of mobile marketing transactions.
iii. To determine the variation in the moderating effect of perceived information security on adoption of mobile marketing transactions by gender.

1.5.1. Research Hypotheses

Guided by the research objectives stipulated above as well as the proposed conceptual framework[1] , the researcher formulated the following hypotheses:

H_1: Greater degree of mobile activity linked to providing information will result in greater mobile-marketing transactions adoption.

H_2: Greater degree of mobile activity linked to sharing content will result in greater mobile-marketing transactions adoption.

H_3: Greater degree of mobile activity linked to accessing content will result in greater mobile-marketing transactions adoption.

H_4: Perceived verification moderates the relationship between:

H_{4a}: Providing information and adoption

$H4_b$: Sharing content and adoption

H_{4c}: Accessing content and adoption

H_5: Perceived authentication moderates the relationship between:

H_{5a}: Providing information and adoption

H_{5b}: Sharing content and adoption

H_{5c}: Accessing content and adoption

H_6: Perceived protection moderates the relationship between:

H_{6a}: Providing information and adoption

H_{6b}: Sharing content and adoption

H_{6c}: Accessing content and adoption

H_7: The moderating effect of perceived verification varies with gender on the relationship between:

H_{7a}: Providing information and adoption

[1] Chapter 3 illustrates and provides a complete discussion of the proposed conceptual framework

H_{7b}: Sharing content and adoption

H_{7c}: Accessing content and adoption

H_8: The moderating effect of perceived authentication varies with gender on the relationship between:

H_{8a}: Providing information and adoption

H_{8b}: Sharing content and adoption

H_{8c}: Accessing content and adoption

H_9: The moderating effect of perceived protection varies with gender on the relationship between:

H_{9a}: Providing information and adoption

H_{9b}: Sharing content and adoption

H_{9c}: Accessing content and adoption

1.6. JUSTIFICATION AND CONTRIBUTION OF THE STUDY

The study strongly links with South Africa's National Research and Development strategy (2002) which is aimed at ensuring that as many of South African citizens as possible are equipped with present technologies and incorporate them in their societal activities including learning, economic activity, and service delivery. This relates to communication and information technology. In the strategy it is argued that from an innovation perspective, economic expansion has proved to be closely aligned to the technical change process in individual firms as well as in the economy as a whole.

Furthermore, results from this study will likely be valuable to both marketers and researchers, especially those in developing countries, where this study draws its sample. Results from this study will benefit marketers in exploiting the prospects of the mobile marketing medium in South Africa. This study will also provide both marketers and policy makers with a set of manageable variables that can be manipulated to stimulate the adoption of mobile marketing transactions.

More imperatively, the study endeavours to plug a gap in the literature concerning the adoption of mobile marketing transactions, specifically within a non-European or Asian context. Since most of the studies have reported on the European as well as Asian experiences (Shaikh & Karjaluoto,

2015), aspects relating to consumer adoption of mobile marketing transactions in African countries have been unrepresented in the literature (Cullen & Kabanda, 2018; Musiime & Ramadhan, 2011; Tarhini, Alalwan, Shammout & Al-Badi, 2019). Against this background, this study seeks to address this paucity in the literature by focusing on the adoption of mobile marketing transactions in South Africa. This in turn will likely steer adoption of marketing innovation amongst South African consumers and consequently narrow the digital divide.

1.6.1. Contribution to the Body of Knowledge

The study will contribute to consumer choice behaviour research, particularly in the African context, by providing insight into the following:

I. Theoretically, this study will offer an alternative lens to view the concept of consumer adoption of marketing technology by using the Uses and Gratification Theory (UGT) (Katz & Blumler, 1974) as the underpinning theory of the study. Most prominent technology adoption researchers (e.g., Holden & Karsh, 2010; Persaud & Azhar, 2012; Venkatesh, Morris, Davis & Davis, 2003) overlooked the predictive power of the UGT in the adoption of mobile marketing transactions.

II. The study also responds to calls from previous studies on m-Commerce to investigate the role of moderators in their relationship with mobile-marketing transactions adoption (Baptista & Oliveira, 2015; Kim, 2008). Therefore, the study proposes information security as a moderator in the relationship between established adoption variables and mobile-marketing transaction adoption.

III. The study is expected to break new ground of discussion as it will unfold the circumstances under which perceived information security can lead to consumers` intention to adopt mobile marketing transactions. In addition, the proposed conceptual model will stimulate research on the effects of information security on consumer behaviour, an aspect that is presently under-represented in most m-Commerce studies but is experiencing a surge in activity.

1.7. DELIMITATIONS OF THE STUDY

This study is limited to only the registered students in selected South African universities which are: (1) University of Limpopo, (2) Vaal University of Technology, and (3) Nelson Mandela Metropolitan University. According to universities south Africa (2017) University institutions in South Africa fall under three official categories: (1) traditional universities, (2) technology universities, and (3) comprehensive universities. As a result, one university was drawn from each category[2].

In addition, the study will only be based on one form of m-Commerce (mobile marketing) and a selection of several related issues, namely consumer behaviour, marketing-related mobile activity, and information security. Special emphasis will be given to the moderating effect of information security on the adoption of mobile marketing transactions.

Furthermore, in general, mobile devices may be considered as any computing device that may be carried anywhere at any time. As a result, mobile devices of different sizes are encompassed (from laptops to mobile phones). In this study, mobile devices are only limited to hand-held mobile devices, meaning light weighed and portable devices that are operated on the move and can be connected to a wireless network.

Lastly, the study will only assess the influence of perceived information security on business to consumer (B2C) mobile marketing transactions, conducted directly between an online store and the consumers who are the ultimate users of its product and services.

1.8. OPERATIONAL DEFINITIONS

This study involves several main concepts, namely: mobile commerce, consumer behaviour, information security, mobile marketing transactions, and moderating effect.

Mobile Commerce: Any transactions with an economic value executed via a wireless telecommunication network (Wu & Wang, 2005). Prominent forms of m-Commerce include mobile

[2] Chapter 4 outlines the sampling technique used to select the universities

banking, mobile marketing, mobile ticketing, mobile investments, mobile shopping, and services. This study will only focus on mobile marketing.

Consumer Behaviour: The study of human responses to products, services, and the marketing of products and services (Kardes, 2002). It entails the way in which consumers deal with purchase decisions in different contexts with the aim of satisfying their product needs and requirements.

Information Security: The safeguarding of information against unauthorised access to, or alteration of, information; be it in storage, processing, or transit (Chellappa & Pavlou, 2002). In this study, information security concerns itself with the protection of online consumers' private information and is proposed as a moderator which affects the strength of the relationship between marketing related mobile activity and the adoption of mobile marketing transactions.

Mobile Marketing Transactions: Mobile marketing transactions can be defined as electronic transactions that are conducted using mobile devices and wireless access networks (Veijalainen, Terziyan & Tirri, 2006). Mobile marketing transactions can be viewed as the progression of Internet based marketing, moved to the mobile medium as a way of responding to the developing trend of consumers shifting attention from traditional marketing channels.

Moderating Effect: The influence of some presumed causal variable X on outcome Y depends in one way or another on (i.e., interacts with) a moderator variable or variables (Hayes, 2012). In other words, a moderator variable is a variable that has the ability to affect the strength or the direction of a relation between two existing variables. In this study, the influence of perceived information security in moderating the relationship between mobile-related marketing activity and adoption of mobile marketing transactions will be determined.

1.9. RESEARCH METHODOLOGY

This section on methodology will discuss the research paradigm, research design, sampling approach, and how the study analysed data.

1.9.1. Research Paradigm

Creswell (2003) states that in order to formulate a suitable research strategy that explains how data will be collected and analysed and knowledge gained, a clear research paradigm should first be established. This is primarily because any philosophical assumptions regarding the topic of interest impact upon how the phenomena can be understood and, therefore, such assumptions must remain constant throughout the research exercise (Creswell, 2003). Morgan (2007) describes a paradigm as a bent of theories and related assumptions shared amongst an association of researchers. According to Blumberg, Cooper, and Schindler (2011), the two most renowned research paradigms are positivism and interpretivism.

Due to the nature of the study, the positivist paradigm is considered preferable because in relation to the research objectives, the positivism paradigm seems more suitable for solving the 'what' and 'how' questions relating to the adoption of mobile marketing transactions. In addition, as done by this study, in positivism a researcher commences with a theory from previous findings or individual observations, generates some hypotheses to be verified, and gathers data that either accepts or rejects the hypotheses (Mohan, 2014). Furthermore, data collection within the pure positivist paradigm follows the quantitative method, containing the representation of holistic phenomena in variables which are measurable.

1.9.2. Research Technique

In order to generalise statistically about regularities in human social behaviour it is necessary to select samples of sufficient numerical size (Saunders, Lewis & Thornhill, 2009). As a result, the use of the quantitative research technique was applied in the study as the primary method for the data gathering process. According to Creswell (2013), quantitative research is a technique for the testing of objective theories through the examination of the relationship between variables. These can be measured typically through the use of instruments, so that numbered data can be analysed using statistical procedures (Moutinho & Hutcheson 2011). Consistent with this view, this study was intended to test relationships existing between variables which are proposed in the research model in Chapter 3. The quantitative approach offers high reliability and generalisability, strength in the testing of theory, reduced vulnerability to researcher bias, and is fast and economical (Sedmak & Longhurst, 2010), which makes it a more attractive research technique for the study at hand.

1.9.3. Research Design

The study employed the descriptive single cross-sectional design (Lindell & Whitney, 2001) in which only a single sample of respondents is extracted from the population of interest, and data is gathered from this sample through a survey, only once. The single cross-sectional design is embedded within the conclusive research approach which is descriptive in nature. The conclusive approach is used when testing specific hypotheses as well as examining relationships where the analysis of primary data is quantitative (Shukla, 2008). The key purpose of descriptive research (Kotler & Armstrong, 2012; Malhotra, 2015) is to recount a phenomenon, for instance, a market characteristic. Descriptive research has some diverse uses, such as narrating the features of particular groups, anticipating consumer behaviour, and establishing attitudes as well as perceptions (Malhotra, 2015). Descriptive research is also employed in order to establish the degree to which marketing variables are related.

1.9.4. Sampling

The study drew its sample from university students in South Africa. Since the samples had similar demographic characteristics, it was assumed that they were invariant except for the variables being tested. While the use of students has been criticised in some studies Calder, Phillips, and Tybout (1981; cited in Shambare, 2012) provide a strong argument for their use, especially in studies that seek to test theory, as in the present thesis. Also, given the time and financial constraints imposed on this doctoral thesis, using students hastened the collection of data and balanced out the financial costs (Perry, 2002).

1.9.5. Research Strategy

Research strategy, according to Remenyi, Williams, Money, and Swartz (2003), provides the overall direction of the research including the process by which the research is conducted. Saunders et al. (2009: 123) acknowledges that: “Although various research strategies exist, there are large overlaps among them and hence the important consideration would be to select the most advantageous strategy for a particular research study. Some of the common research strategies used in business and management are experiment, survey, case study, action research, grounded theory, ethnography, archival research.” From these various strategies, in line with the research paradigm and design, this study sought to adopt the survey research

strategy. A survey is a systematic method of gathering data from a population, by sampling a portion of that population and subsequently generalising the attributes of the population from this sample.

1.9.6. Data Collection

Due to the large nature of the sample for the study, three research assistants were recruited and assisted in collecting data. They distributed questionnaires at strategic locations including student villages, public libraries, and lecturer halls where students frequent. Respondents were asked to drop off completed questionnaires in collection boxes placed close to the above-mentioned locations. The data collection at the selected universities was conducted from July 2018 to November 2018. In total 810 students participated during the survey, which was deemed sufficient to satisfy the minimum requirements for testing models through multivariate techniques (Field, 2009).

1.9.7. Data Analysis

Statistical Packages for Social Sciences (SPSS) Version 26 was used to analyse the collected primary data. In keeping with research objectives, the data analysis utilised included descriptive statistics, non-parametric tests including chi-square tests, and multivariate tests. Specifically, the following data analysis techniques were performed:

- ***Factor analysis:*** for data reduction as well as testing validity
- ***Linear regression:*** for testing direct effects of marketing related mobile activity on adoption
- ***Moderated hierarchical regression****:* for predicting the moderation effect of information security on adoption.

1.10. ETHICAL CONSIDERATION

To protect research respondents from any potential adverse impact arising from this study, the regulations and procedures specified by the University of Venda Research Ethics Committee were followed. Thus, to uphold high standards of ethics, the researcher ensured that the data collection instrument was submitted to the University of Venda Research Ethics Committee so

that it conformed to all the university's regulations. In addition, permission of access was sought and granted from the three universities that were selected for data collection. research participants were advised of the nature of their involvement in the research beforehand, including their right to privacy and dignity. Lastly, the results of the study are reported honestly even when the results turned out to be contrary or different from the researcher's expectations.

1.11. CHAPTER CONTENT ANALYSIS

As recommended by Perry (1998), this thesis follows the structured six-chapter approach, which is the standard for doctoral theses in the marketing discipline. Accordingly, the literature review as it pertains to this research is broken down into two separate but related chapters – Chapters 2 and 3. In the former, trends are reviewed in retail mobile marketing and in the latter, a synopsis is provided of consumer choice behaviour literature. The thesis chapters are structured as follows:

Chapter 1: Introduction – this chapter provides a general overview of the study in terms of an introduction, motivation, rationale, and contribution of the study. The background to the study, research problem and research question, as well as the objectives of the study are also presented.

Chapter 2: Literature Review (Mobile Marketing) – the existing body of literature is analysed as it relays to the theory and practice of mobile marketing. While the discussion revolves around the global perspective, particular emphasis is placed upon mobile marketing transactions adoption within the South African context.

Chapter 3: Literature Review (Conceptual Frame) – the extant literature on consumer choice behaviour is analysed. Various predictors of adoption of mobile marketing transactions, including marketing related mobile activity, are reviewed. Furthermore, the theories relating to innovation adoption and conceptualisation of the research framework are outlined in this chapter as well.

Chapter 4: Methodology – consistent with the conceptual model developed in Chapter 3, this chapter contains a description of the suitable research methodology to address the study objectives. Justification of such is proffered by evaluating alternative research designs and methodologies, thus pronouncing the selected methodology as being most appropriate to answer the research questions and problem. Also, ethical issues, reliability, and validity are discussed in this chapter.

Chapter 5: Analysis and Results – in this chapter, the data gathered is analysed. Since the research utilises quantitative data, statistical analyses constitute the content of this chapter.

Chapter 6: Conclusions and Recommendations – the study concludes with a thorough discussion of the implications of the predictors of mobile marketing transactions adoption in the South African retail environment. Deductions are presented within scholastic and practical contexts.

1.12. CHAPTER SUMMARY

Chapter 1 has laid the foundation for the study. The research problem, research objectives, and investigative hypotheses were introduced in this chapter. In addition, justification for undertaking the research and definitions of key terms as they pertain to this study have also been presented. Finally, the research design, sampling, and research ethics were explained. Against this premise, the thesis proceeds with a detailed description of the research, beginning by reviewing the literature as it pertains to mobile commerce in Chapter 2.

CHAPTER TWO

THE DEVELOPMENT OF MOBILE MARKETING IN SOUTH AFRICA

2.1. CHAPTER OVERVIEW

As a follow up from the introduction and background discussed in the previous chapter, this chapter provides insights into the concepts of mobile marketing, mobile commerce, and mobile security. This chapter begins with defining mobile marketing as well as reviewing the different mobile marketing services which are facilitated by the mobile platform, followed by a discussion on the evolution of m-Commerce. Thereafter, the impact of ICT developments in the retail sector as well as the associated technology trends affecting the m-Commerce sector are discussed. Next, mobile marketing as it relates to the South African retail environment is discussed. The chapter then wraps up by specifically reviewing the security threats surrounding m-Commerce, with special attention on perceived information security in mobile marketing transactions. These discussions will eventually provide the basis for putting forward the adoption conceptual frames, which culminate in the research issues that will be developed in Chapter 3.

2.2. LITERATURE REVIEW PROCESS

In order to conduct as well as present a thorough review of the research issues, the literature review component of this thesis will be separated into two sections: (1) literature on the selected industry, and (2) literature on the appropriate theoretical frameworks (Onwuegbuzie & Frels, 2016; Perry, 2002). The former covers mobile marketing and is the focus of this particular chapter. The theoretical literature, focusing on consumer adoption of mobile marketing transactions will be discussed in Chapter 3. Figure 2.1 outlines the sequence of the rest of the chapter.

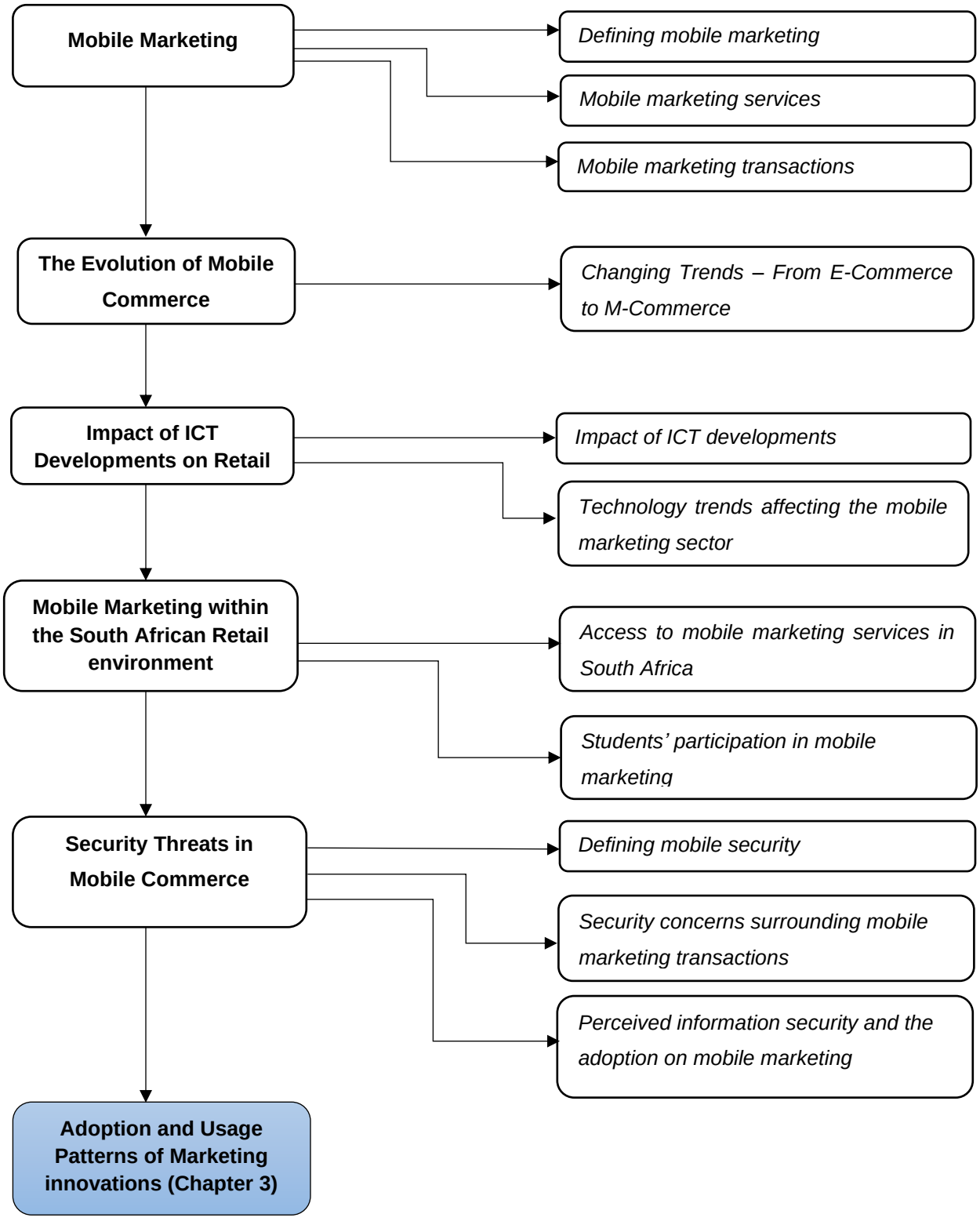


Figure 2.1: Literature Review Process

Source: Developed for this research

2.3. INTRODUCTION

Prior to the advancement in technology, marketing heavily relied on traditional domains such as print, broadcast, direct mail, and telephone (Mahan & McDaniel, 2006). Also, firms' operations were restricted to geographic locations and mainly confined to brick and mortar shops. However, while some businesses still use traditional marketing methods to attract new customers others, mostly in developed countries, have added or completely replaced traditional marketing with new or innovative marketing tactics (Higuera, 2015).

With technological advancements, transformation of marketing is underway as now consumers spend more time on their hand-held mobile devices such as cell phones, smart phones, PC tablets, palmtops, and personal digital assistants (PDAs) (Benady, 2014). As a result, firms are now increasingly reaching out to their consumers by means of mobile commerce (Maity & Dass, 2014). According to Martin (2011: 1), the mobile devices 'have enabled consumers to be plugged in, always on, and completely in control in a way that changes the fundamental assumptions of marketing and customer service'. Consequently, businesses need to adjust in order to reach consumers in the digital world but connecting with them in a mobile world entails a new set of principles and best practices.

While the idea of stimulating marketing services with technological innovations is appealing, getting consumers to use these new innovations is challenging (Dabholkar & Bagozzi, 2002; Teece, 2010). Getting consumers to try new innovations for the first time according to Shambare (2012) normally considers a significant change in behaviour, and as such is the most prominent impediment to the adoption of new innovations. As a result, it becomes essential to have a clear understanding of the market as well as to assess consumers' readiness, willingness, as well as their ability to use these innovations. Consequently, the looming question relates to whether marketers really comprehend consumers' needs and motives for using these new products. The latter will be discussed in detail in Chapter 3.

2.4. DEFINING MOBILE MARKETING

Available literature has shown a lack of common understanding on the actual definition of mobile marketing; however, this has not brought to a halt research on the subject as researchers are still proposing many kinds of different definitions for it (Latto, 2014). For example, one of the earliest

definitions comes from Ververidis and Polyzos (2002: 23), who defined mobile marketing as 'all the activities required to communicate with the customer through the use of mobile devices in order to promote the selling of products or services and the provision of information about these products and services'. This definition indeed is very credible, since it is not only fairly easy to understand and utilise but also not too specific and restrictive towards mobile marketing's many characteristics. Another earlier mobile marketing definition is given by Dickinger, Haghirian, Murphy, and Scharl (2004: 12) who distinguished mobile marketing as 'the use of interactive wireless media to provide customers with time and location sensitive, personalised information that promotes goods, services, and ideas thereby generating value for all stakeholders'. Three years later Haghirian and Inoue (2007: 5) refined Dickinger et al.'s (2004) definition and referred to mobile marketing as 'the usage of mobile Internet-based media to transmit advertising messages to consumers, irrelevant of time and location, with personalised information with the overall goal to promote goods and services'. It needs to be noted, however, that these definitions were developed roughly fifteen years ago, and a lot has advanced in the world of mobile marketing from that time. According to Scholz and Duffy (2018), this poses a real challenge when exploring the field, as some of the current literature concerning mobile marketing is based on practices that made use of classic mobile phones, or feature phones, which had very few and simple capabilities.

As mobile marketing has emerged to be a more interesting research topic recently (Varnali & Toker, 2010), new definitions have begun to arise at a more rapid pace. Huang and Symonds (2009: 2) classified mobile marketing as a 'process of delivering messages from business to consumers using permission-based and interactive communication services over mobile communication media'. On the other hand, Shankar and Balasubramanian (2009: 1) generalise mobile marketing as a 'two-way or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device, or technology'. It is important to note that this definition again emphasises the same three common aspects as most other definitions do: (1) mobile technology, (2) interactive network, and (3) relationship between customers and businesses. Kaplan (2012) simplifies the aforementioned definition even further by stating that mobile marketing is just 'any marketing activity conducted through a ubiquitous network to which consumers are constantly connected using personal mobile devices'. Kaplan (2012) also argues that while personalisation is the main benefit for mobile marketing, not all marketing needs to be conducted in a personalised manner.

According to Latto (2014), an analysis of the various mobile marketing definitions can result in the identification of two distinct schools of thought on the matter. Some researchers (Latto, 2014) characterise mobile marketing with highly precise, possibly business-centric ways, which frequently does lead to a focused research. However, this characterisation poses the bias of ruling out some of the other scopes or variables of mobile marketing. Other scholars prefer the opposite and characterise mobile marketing quite broadly, which enables various types of studies to be conducted under the topic; but this can contribute to the fragmentation and inconsistency of the academic research in the field (Latto, 2014). A good example of the latter category can be found in the studies by Karjaluoto and Huhtamaeki (2010) as well as Smutkupt, Krairit, and Esichaikul (2010). These studies provide practically identical definitions by stating that mobile marketing is 'the use of the mobile medium as a means of marketing communications'. Smutkupt et al. (2010), however, narrow this down later in their study by mentioning some few related aspects of interest as some of the previously mentioned definitions did. According to the authors, the major advantage of mobile marketing lies in its potential to enhance communications by providing customised/personalised, timely, and location-specific information without restriction of time and place. Karjaluoto and Huhtamaeki (2010) posit that despite all of the proposed definitions, still no one can say what mobile marketing really means in the end, at least term-wise.

Taking all this into account, this study propounds that mobile marketing should be viewed from the official universal definition which comes from the umbrella organisation of the industry, the Mobile Marketing Association. According to the Mobile Marketing Association (2009), 'mobile marketing is a set of practices that enables organisations to communicate and engage with their audience in an interactive and relevant manner through and with any mobile device or network'. The Mobile Marketing Association (2009) have further explained the two-part classification of this definition, as depicted in Figure 2.2:

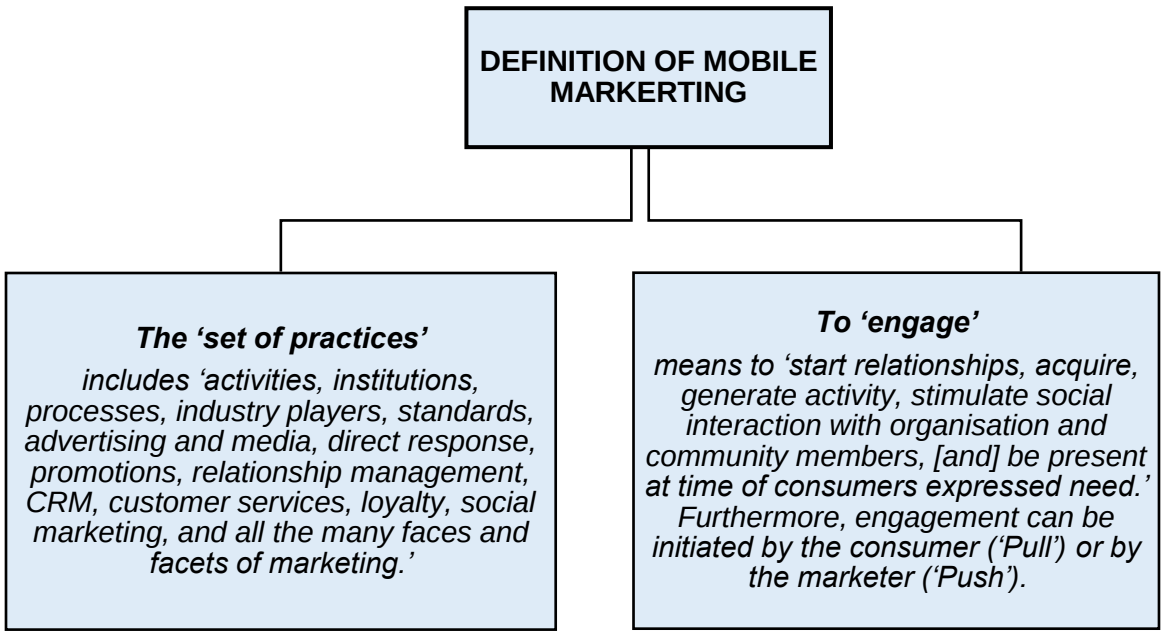


Figure 2.2: Two-Part Classification of Mobile Marketing Definition

Source: Author's own construct

Having defined mobile marketing, it is important to note that despite the name, telemarketing is not to be confused with mobile marketing. Kotler & Armstrong (2012) agree with this concept and state that 'today marketing must be understood not in the old sense of making a sale – *telling and selling* – but in a new sense of satisfying customer needs'. As stated by Latto (2014), in mobile marketing customer needs are not necessarily bound to a place or time, but are spontaneous and have to be satisfied carefully if a business is going to convert the needs into sales. Mobile devices give buyers the power to search for products and services in the exact time of need, which means they react to companies' marketing when they are ready to buy (Krum, 2010). Against this background, as stated earlier in the introduction, it becomes crucial for this study to explore consumer behaviour further (this will be done in Chapter 3). Consumer behaviour necessitates an understanding of consumer attitudes and perceptions, which change relatively fast with the new technological possibilities and trends emerging within the mobile market.

2.4.1. Mobile Marketing Services

Developments in mobile technology have ushered in a variety of mobile marketing services. In general, mobile marketing services are imbedded in four main categories (Demir, 2013): (1)

communications services, (2) information content services, (3) entertainment services, and (4) commercial transaction services. These are discussed at length in the following sections.

2.4.1.1. Mobile Communication Services

Mobile communication services, which are currently the most widely used form of marketing, include short message service (SMS), multimedia message service (MMS), and emails (Demir, 2013). Short message service is a reliable way of sending personalised messages to consumers. Text messaging is also an effective way to building more personal relationships, compared to other channels (Boyle, 2013). Short message service is instantaneous, can be easily reported on, and can be used to communicate in a much more intimate way. On the other hand, MMS mobile marketing contains a timed slide-show of images, text, audio, and video. Marketo (2019) posits that SMS and MMS are very powerful channels for mobile marketing, with over 3.6 billion people being able to receive SMS messages globally, and more than 50 per cent of those messages being opened within three minutes. Lastly, according to Marketo (2019), with 57 per cent of emails being opened on mobile platforms, it is clear that consumers are engaging with email campaigns on their mobile devices. Particular groups of customers can be targeted by businesses or even individuals through email services. Offering individual customers special deals on merchandise and/or services on the customer's birthday, for instance, is one example of email marketing personalisation. Email marketing helps a business develop and maintain a relationship with a customer over time that hopefully results in increased sales and increased customer loyalty.

2.4.1.2. Entertainment Services

Entertainment services are rapidly becoming popular among consumers, and marketers are actively contracting entertainment content providers to provide an opportunity for them to reach mobile consumers via their mobile devices. Examples of mobile entertainment services include mobile gaming, mobile video, and mobile music (Barutçu, 2007, Wang, 2016). Through these mobile entertainment services, marketers thrive to interact with consumers by delivering embedded marketing messages and incorporating branding directly into the entertainment environment (Çeltek, 2010). Liu, Sinkovics, Pezderkab, and Haghirianc (2011) state that when marketers communicate with consumers in an entertaining environment, they are likely to increase their purchasing intentions regarding the advertised products. The youth segment, in particular, is entertainment-oriented and as such has become a prime target for online marketing

via mobile entertainment services. For instance, a survey conducted by Defy Media (Arnold, 2017), shows that the youth spent most of their time online watching entertainment videos, and 63 per cent of respondents aged 18-24 indicated that they would try a brand or a product recommended on YouTube content. Businesses are also taking notice and shifting attention more towards mobile services than mainstream media in order to reach the millennials.

2.4.1.3. Information Content Services

Information content services involve the creation and sharing of media and publishing content in order to acquire customers (Demir, 2013). This information is usually presented in a variety of formats including news, video, white papers, e-books, infographics, and case studies. Content marketing is primarily focused not on selling, but on simply communicating with customers and prospects. The idea is to inspire business and loyalty from customers by delivering consistent, ongoing valuable information. Nowadays a lot of content is not just delivered over the Internet via web browsers; businesses are packaging content into their mobile apps and reaping the rewards with customer intimacy and customer data (Houghton, 2014). The apps often result in businesses having a conversation with the customers, discovering the customer's needs and preferences, all the while enriching them with valuable information. In the end, there is an opportunity to buy the customised product or service, and the purchasing flow is seamlessly incorporated into the app. The more value the app provides, the more loyal the user will be to the app and the company that provides it.

2.4.1.4. Commercial Transaction Services

Commercial transaction services move a step further from just communicating with consumers. They enable consumers to conduct financial transactions such as paying bills, and shop for goods and services using their mobile devices (Hong, Thong, Moon & Tam, 2008; Wankmueller, 2012). Online businesses seek for payment services from trusted companies in order to facilitate online transactions. For instance, PayFast is a payment processing service for South Africans and South African websites which enables easy and instant transfer of money between online consumers and retailers using different payment options such as credit cards, ATM debit cards, electronic fund transfer, and Quick Response Codes (QR codes). It is this last mobile marketing service that is of interest in this study and is discussed in detail in the ensuing section.

2.4.2. Mobile Marketing Transactions

Online marketing transactions conducted over the mobile platform are gaining popularity due to the convenience and portability of low-cost hand-held devices (Lam, Chung, Gu & Sun, 2003; Narang & Arora, 2016). In order to promote the adoption of electronic commerce, system designers have been actively exploring approaches that may attain higher penetration than the wired Internet. With the explosive growth of mobile phone population and the fast adoption of wireless network technology, support for commerce transactions over the mobile platform has become a realistic and attractive option (Johnson, Kiser, Washington, & Torres, 2018). Besides, the cost and performance of hand-held devices with wireless capability have also improved tremendously in recent years.

A mobile marketing transaction can be defined as an electronic transaction that is conducted using a mobile device and a wireless access network (Veijalainen et al., 2006; Pasqua & Elkin, 2012). The transaction is a result of communication and promotion (marketing) of an offer between a firm and its customers using a mobile medium, device, or technology. Generally, a mobile marketing transaction occurs when a client accesses the web-enabled services of an online business and after necessary negotiations and communications, decides to place an order and make payment (Shim, Qureshi, Siegel and Siegel, 2013; Siddiqui, 2002). The order and payment information is transmitted from the mobile device to a base wireless station and from there, through the mobile communication infrastructure of the service operator, to the wireless application gateway of the merchant. In a typical mobile computing environment, one or more of the transacting parties are based on some wireless hand-held devices. The steady shift of consumer behaviour to online shopping from brick and mortar retail stores has not been lost on wireless mobile device manufacturers. Mobile commerce is yet another way to purchase online products from online storefronts or online services from automated service providers. Computer-mediated networks enable these transaction processes through online store searches and wireless point-of-sale (WPOS) capabilities.

However, security over the mobile platform is more critical due to the open nature of wireless networks (Zhang, Patras & Haddadi, 2019). Furthermore, security is more difficult to implement on the mobile platform because of the resource limitation of mobile hand-held devices. Therefore, security mechanisms for protecting wireless mobile communications need to be revisited to ensure that marketing transactions involving mobile devices can be secured and implemented in

an effective manner. Hence this study aimed at assessing the moderating effect of information security on the adoption of mobile marketing transactions in the South African context. An in-depth discussion of the security issues surrounding mobile commerce is highlighted later in the chapter.

2.5. THE EVOLUTION OF MOBILE COMMERCE

Mobile commerce is an emerging discipline involving applications, mobile devices, middleware, and wireless networks. Sheikh (2009) posits that m-Commerce refers to the ability to conduct wireless transactions of a commercial value using mobile applications in mobile devices. In its present state, m-Commerce can be viewed as an extension of conventional, Internet based e-commerce, which adds a different mode of network and accommodates different end-user characteristics (See Table 2.1).

Table 2.1: Differences between E-Commerce and M-Commerce

Basis for comparison	**e-commerce**	**m-Commerce**
Meaning	Any kind of commercial transaction that is concluded, over the Internet using electronic system is known as e-commerce.	M-Commerce refers to the commercial activities which are transacted with the help of wireless computing devices.
Ease of carrying device	No	Yes
Reach	Narrow i.e. it is available only in those places where there is Internet along with electricity.	Broad due to its portability and does not necessarily require fixed Internet and electricity connection.
Device used	primarily desktop computers	Portable mobile devices; smartphones, tablets, Personal Digital Assistants (PDAs), iPad etc.
Use of Internet	Mandatory	Not mandatory (allow the use of offline mode)
Payment gateway	Credit cards	Cyber cash, m-Wallet, QR codes, mobile banking, or user's credit card.
Connectivity	Narrower	Wider owing to the bigger number of mobile users and wireless connectivity.
Usage	Less simple because of a more complicated user interface and more functions	Simple because all functions have been simplified.

Source: Simicart (2019)

In order to understand how m-Commerce evolved, it is imperative to first establish the history of e-commerce – which is where it came from. Electronic commerce started in the early 1970s, when companies were using electronic data interchange (EDI) to exchange important documents such as order forms and payment receipts with other businesses (Roos, 2008; Schoenherr, 2019). This method replaced the old fashion of mailing and faxing business documents with a digital transfer from a company's system to another. Even though electronic commerce was initially developed in the late 20th Century, it already has a history that can be divided into three major periods of time: 1990-2000, the years of invention and discovery; 2001-2006, the period of consolidation; and 2007-present, the years of reinvention with social media and mobile commerce (Laudon & Traver, 2017).

During the invention period, consumers discovered electronic commerce and started to purchase simple goods/services on the Internet from e-commerce retailers. Information technologists and computer scientists consider electronic commerce success nowadays as a fruit of the technological advances back in the late 1990's. Some of these advances include the development of the Internet, the invention of various electronics devices, the spread of the wireless connection, and the use of large search engines at that time such as Yahoo (Laudon & Traver, 2017). The vision of electronic commerce was to offer a worldwide communications and computing environment through hypertext markup language (HTML) pages created by individuals, technologists, and scientific institutes, that everyone could access with a regular computer from different locations (Rayport & Jaworski, 2017).

Beginning in 2000 with the establishment of a stronger presence and acceptance by consumers, e-commerce shifted the way consumers purchase items from the traditional in-store shopping to buying on the Internet. Kabbaj (2018) points out that large firms found out about the rapid growth of this industry and started using the Internet to build up their market positions and expand their brand by following the B2C e-commerce model. Therefore, e-commerce retailers offered a broader choice of products and online services such as travel reservations, the ability to use financial services, and make online payments (Laudon & Traver, 2017). During the reinvention period (2007-present), electronic commerce has been developed and improved by the growth of online applications, dynamic web pages, and social media (online social networks such as Facebook, Instagram and Twitter, and blogs). Another factor that mainly contributed to e-commerce growth is the collaborations of large tech companies in e-commerce industry in 2010. For instance, Microsoft and Amazon agreed to share access to their patent portfolios, and VISA

purchased the credit card payment service Cyber Source. In this period, mobile commerce started growing as well, making it a significant portion of the overall e-commerce market.

2.5.1. Changing Trends – From E-Commerce to M-Commerce

One of the most profound paradigm shifts that the retail industry is facing in current times is the gradual but steady transition from e-commerce to m-Commerce (Singh, 2017). With more than 50 per cent of total global online sales coming from hand-held mobile devices (See Figure 2.2), businesses are now doubling their efforts towards creating mobile optimized websites to cater for the customers on the go. Several industry giants have capitalised on the concept and have launched many new services to facilitate trade on the mobile platform. For instance, as conveyed by Pahwa (2018), Amazon has launched its prepaid wallet service – Amazon Pay, National Payments Corporation of India has brought the simpler version of Immediate Payment Service (IMPS) to mobile in the form of Unified Payments Interface (UPI), Google has launched Google Tez to promote transactions through UPI and South African online retailer Takealot launched its mobile app in 2013. Furthermore, businesses these days are dedicating a large portion of their research and development efforts to how mobile devices play a role in shaping consumer behaviour and their buying patterns.

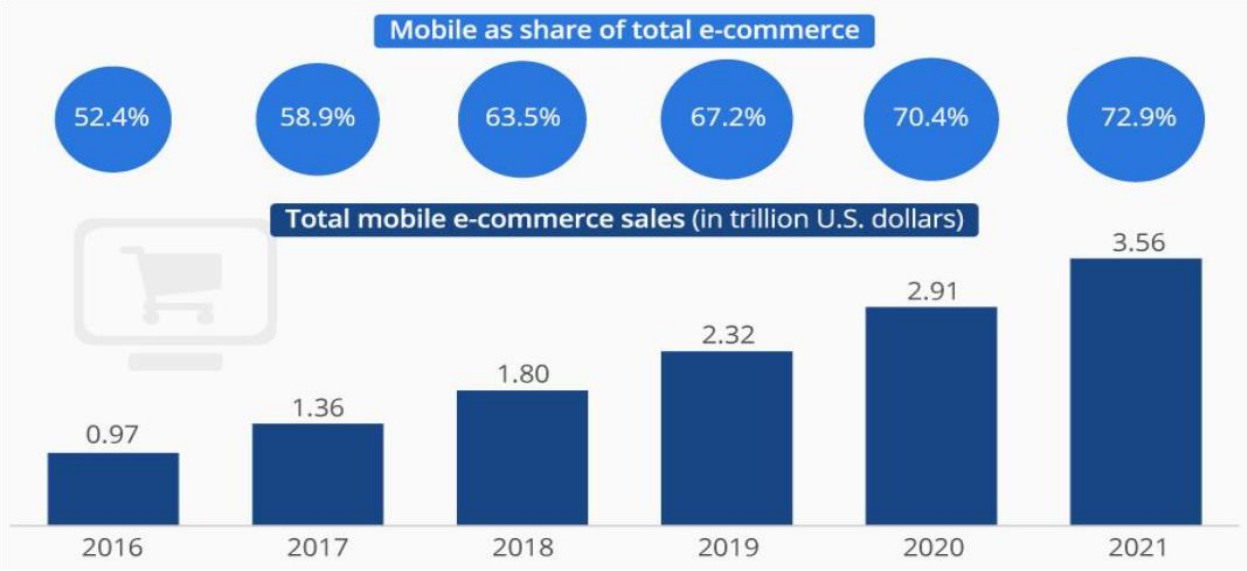


Figure 2.3: Estimated Global Mobile Commerce Sales

Source: eMarketer report (2018)

As depicted in Figure 2.2, global m-Commerce growth is primarily being driven by the increased usage of mobile devices to acquire goods and services by consumers. Projections by eMarketer (Loesche, 2018) established that retail e-commerce sales reached US$2.3 trillion in 2017, a 23.2 per cent increase over the previous year. The mobile transactions share of this period stood at 58.9 per cent, or US$1.4 trillion. In 2021, m-Commerce could rake in some US$3.5 trillion and make up almost three quarters (72.9 per cent) of e-commerce sales. Researchers (Deshmukh, Deshmukh, & Thampi, 2013; Niranjanamurthy, Kavyashree, Jagannath, & Chahar, 2013; Meola, 2016) suggest that the growth of m-Commerce in the coming years will surpass e-commerce, implying that the impact of mobile phones on individuals' day-to-day activities is significant. Karam (2017) suggests the following as some of the major contributing factors to the growth of m-Commerce:

i. **Customisation** – having access to data about the user facilitates the offering of personalised services. Business constantly get updates about the status and location of the user, and with good data analysis, they can customise to respond better to customer's needs.

ii. **Accessibility** – users are not obligated to carry a modem around with them to have an Internet connection. A network signal is enough for a user to run the app and perform commercial transactions, which means that providers can reach customers over a longer range.

iii. **Mobile payments** – customers can pay for their purchases right there in the app with 'in-app payments.' It means that payments are hosted by the platform and sometimes do not require third-party services. Another incredible thing is the existence of mobile wallet where customers can register a pre-paid account from where money can be debited with each purchase.

iv. **Convenient** – there is no need for buyers to visit a physical shop, which automatically means they are saving time and money. This is similar with e-commerce, except that with m-Commerce customers can transact on the go.

v. **Instant contact** – if controlled properly customers can reach a business instantly through, for instance, live chat, calling with one click, twenty-four hour sales, and real time product feedback.

Yang (2016) postulates that m-Commerce arguably differs from its more traditional, desktop computer-based e-commerce predecessor. In as much as m-Commerce services are accessible on the move through mobile devices with fundamentally different presentation, processing, and interaction modalities compared to a desktop computer, such services enable a whole new set of unprecedented service capabilities, including location awareness, context sensing, and push delivery (Mylonopoulos, Doukidis, & Editors, 2003). Unsurprisingly, such features have sparked wholly new service categories, such as location-based (Xu, Teo, Tan, & Agarwal, 2009) and context-aware services (Ngai, Cheng, Lun, Cao, & Lee, 2011) and have generated immense interest in academia and industry alike as to the research challenges and consumer behavioural dynamics associated with them. It is against this background that m-Commerce needs to be considered not simply as a new distribution channel but a new aspect of consumerism and a much more powerful way to communicate with customers. As virtual retailers are expanding more into the African markets, the orientation of African consumers toward mobile technology as a retail channel requires extensive research. However, as espoused by Chong, Chan, and Ooi (2012: 40), from a consumer behaviour perspective, several managerial and technological concerns are raised when it comes to the adoption of m-Commerce and its applications. Consequently, to ensure a successful transformation from traditional e-commerce to m-Commerce several factors should be addressed, specifically the driving factors that influence consumers' behavioural intentions to adopt m-Commerce. Therefore, studies such as the current one are important in overcoming the developmental lag in the adoption of m-Commerce in a South African context.

2.6. IMPACT OF ICT DEVELOPMENTS ON RETAIL

In recent years, the retail environment has changed dramatically as advances in technology and evolving consumer behaviour have reached a tipping point (Notomi, Tsukamoto, Kimura, & Yamamoto, 2015). With the rapid expansion of ICT, today's marketing efforts increasingly focus on multi-channel strategies. Traditional retailers with brick-and-mortar stores, such as supermarkets, department stores, convenience stores, and specialised stores, have stepped up their efforts to implement integration of their online and physical retail activities. At the same time, online retailers are expanding their reach by partnering with retailers who already have physical stores and service establishments. Furthermore, through ICT, contemporary consumers no longer go to stores merely to shop but instead, they pursue the optimal purchasing experience by gathering information on the Internet and ordering and receiving products anytime and anywhere (Ono, Nakamura, Okuno, & Sumikawa, 2012).

ICT has also played a critical role in shaping the retail industry; for instance, over the past few years, it has been used to create globally connected and real-time supply chains in consumer society. The increasing connectivity and use of wireless technologies is in many ways blurring the roles of consumers and producers, with consumers assisting in product development and promotion (Nambisan & Baron, 2007; Kristensson, Gustafsson, & Archer, 2004; Indahingwati et al., 2019). With the advent of social media and social selling, engagement with customers also now extends far beyond just 'transactions'. Business models have evolved so that manufacturers and suppliers now sell online directly to customers, while many businesses also test the market through m-Commerce before investing in brick and mortar stores. Mobile commerce, therefore, does not necessarily imply the removal of physical stores, but rather an evolution of how retailers fulfil orders (Parker & Wang, 2016).

At the core of retail transformation due to ICT developments is the rising adoption of mobile digital devices on a global scale, such as smartphones and tablets, which have a profound transforming impact on consumer behaviour and retail businesses at large (Schwab, 2017). Pervasive mobile coverage, smartphones, and increasing Internet penetration have all facilitated the emergence of a multitude of new retail marketing channels. Consumers are, therefore, no longer bound geographically when searching for the best price or service. With the increase in mobile broadband speeds via 4G on mobile devices, the end-user experience of mobile marketing has been increasingly enhanced. As 5G use cases become widespread in Africa over the coming years, it is highly likely that m-Commerce will increasingly become one of the main fulfilment channels for consumers. In the subsequent section, an overview of the mobile market both regionally and in South Africa is highlighted.

2.6.1. Regional and Local Mobile Market

When it comes to mobile phones, Africa is truly undergoing a revolution. A recent study shows that Africa is the first continent to have more mobile phone users than fixed-line subscribers (Answersafrica, 2019). Mobile phones, particularly smartphones, have revolutionised Africa during the last years and more Africans have begun using mobile phones since the year 2000 than in the whole of the previous century. The International Telecommunication Union (ITU) presented new statistics on the telecom sector in Africa at the recent Africa Telecom conference held in Cairo (Africabusiness, 2019). According to the ITU survey, Africa has become the world's fastest-growing mobile phone market. Over the past five years the continent's mobile phone use

has increased at an annual rate of 65 per cent, which is twice the global average (Africabusiness, 2019). This is good news for telecom investors and online businesses in Africa.

According to Oyelaran-Oyeyinka and Adeya (2004), in the generally sparsely populated and extensive African continent, where the majority population lives in poverty, the large costs of stringing up telephone wires so far has not been economically viable and hence most Africans use mobile phones. The establishment of mobile phone networks has also defied structures hostile to investment: warfare, failed states, and natural disasters. For instance, Somalia, which has not had any central government for over a decade, has achieved a vibrant mobile industry. Mobile phones have also steadily advanced in Congo Kinshasa and Liberia despite heavy warfare. This remarkable growth in the African mobile market is expanding nearly twice as fast as Asia's and has confounded analysts and even service operators (Africabusiness, 2019). The rise is expected to be bolstered by expansion of local and regional economies and more service providers rolling out networks across the region. Increased demand for mobile phones is expected to provide phone manufacturers with a steady supply of customers, as existing owners upgrade their models and new subscribers come online with increased network expansion.

In South Africa, the growth within the mobile phone market is predominantly driven by the introduction of extremely low-cost smartphones (Louw & Von Solms, 2018). This is fuelling the transition from traditional mobile phones to smartphones. Another trend has seen South African consumers enthusiastically adopting larger screen sizes of five inches and above. For most South Africans, mobile is the only way for people to access the Internet. Curling (2018) propounds that mobile phone technology has exceeded all expectations over the last three decades and it shows no sign of slowing down, especially in emerging markets like South Africa, where the majority of the country's 21 million Internet users access the online world via their mobile devices. On top of that, a remarkable 80 per cent of Internet users use only their mobile phones to go online, and 67 per cent of mobile searches begin with intent to purchase, like: 'Italian restaurants in Sandton.' Google's 2017 Connected Consumer Survey (Curling, 2018) found out that 60 per cent of South Africans now use a smartphone. This is an increase of 13 per cent since 2014 and it is estimated the number of smartphone users in South Africa will expand to over 25 million by the year 2022. These figures pose great opportunities for businesses in South Africa to adopt online marketing strategies. Cognisant of this rise in the South African mobile market, the next section reviews the current state of mobile marketing within the South African retail environment.

2.7. MOBILE MARKETING WITHIN THE SOUTH AFRICAN RETAIL ENVIRONMENT

South Africa has the most established retail market and the highest consumer spending in Africa (Deloitte, 2015). Even in the wake of volatile global economic conditions, retail sales in South Africa continue to grow driven by relatively low inflation and low interest rates. However, due to the changing purchasing patterns of consumers, retail remains the most dynamic urban market in South Africa and regionally, with changes almost daily. Furthermore, the increased connectedness of consumers due to the proliferation in mobile technologies is contributing to this dynamic environment – one where expectations on what the buying experience must entail are evolving. As stated in the preceding section, most South African consumers now have a mobile device, making it the most pervasive platform for marketing and communication currently available, and one with the deepest reach. Thus, South African businesses are gradually shifting attention away from traditional marketing medium (for instance TV, radio, and newspapers) and focusing more on innovative marketing modes such as mobile technology. To tap into the mobile technology, South African businesses are also integrating the online retail concept in their operations while others such as Bidorbuy, Yuppiechef, Takealot, Suberbalist, and Expartshop (See Table 2.2) sorely operate online.

Table 2.2: Common South African Online Stores

Online store	Description
Bidorbuy.com	Bidorbuy is an online marketplace that brings buyers and sellers together to trade almost anything, through online auctions and fixed-price sales. Bidorbuy is the largest site of its kind operating in South Africa. The majority of goods sold on Bidorbuy are new items (as opposed to second-hand goods).
Yuppiechef.com	Yuppiechef is a food community offering you the tools, ingredients and the inspiration to cook real food at home. Although specifically set up for those who move in culinary circles, online retailer Yuppiechef trades in a range of kitchenware, appliances and tools to transform any individual's cooking experience.
Takealot.com	Takealot.com is the leading online retailer in South Africa and one of the largest, most innovative retailers on the African continent. Takealot products ranges from TVs, laptops, cell phones, kitchen appliances, toys, books, beauty & more.
Superbalist.com	Superbalist is South Africa's biggest online fashion and beauty destination. Its products ranges from workwear to sweats and other off-duty staples, formal and casual attire.
Expatshop.co.za	Expatshop is South Africa's online one stop grocery store which sells a wide range of products.

Source: Compiled by the author

Online retailers in South Africa still make up a small proportion of overall retail, but this is picking up as the number of online shoppers continues to experience growth and are projected to further expand (See Figure 2.3). According to Zhou, Dai, and Zhang (2007) online marketing, specifically through mobile devices, is playing a pivotal role in converting potential online shoppers to active ones. As depicted in Figure 2.3, at the end of 2019 the estimated number of online shoppers stood at 21.5 million, with an additional 3.3 million users expected to be shopping online by 2021.

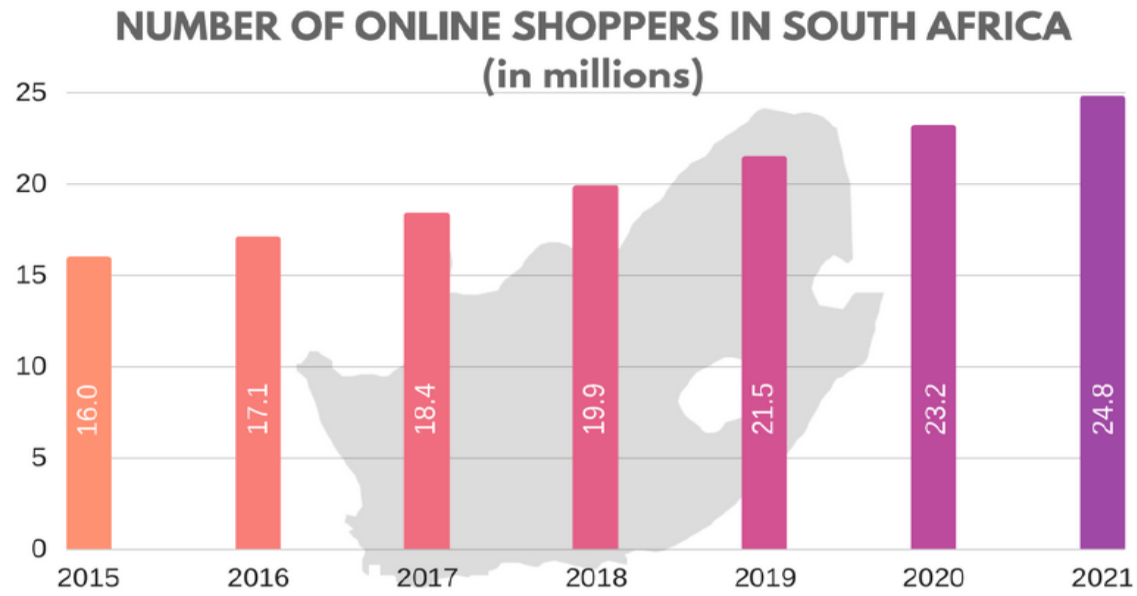


Figure 2.4: Estimated Number of Online Shoppers in South Africa

Source: eShopworld (2017)

The rise in mobile marketing within the South African retail environment has led to a change in consumer expectations and demands, especially as far as convenience, variety, and shopping experience is concerned. In addition, consumers today are far less predictable and they actively seek out new information pertaining to a product or service (Kingsnorth, 2019). As a result, due to mobile technology invasion into the South African retail environment, there is an increase in demanding and well-informed customers**.**

2.7.1. Demanding and Well-Informed Consumers

Today's consumers are well informed and demand absolutely the best – best products at best prices provided with the best customer service. Farquhar and Meidan (2010) explain that they exercise more freedom in their consumption, specifically in a way that increases their satisfaction

and are no longer loyal to firms or brands. Information asymmetries of the past are no more; customers have access to information that was once only privy to retailers. Commenting on post-modern consumers, Stuart-Menteth, Wilson, and Baker (2006; cited in Shambare, 2012) identify seven attributes that differentiate them from the traditional. These attributes are cynical, knowledgeable, time-poor, tribal, individual, demandingness, and experience-seeking, as summarised in Table 2.3.

Table 2.3: Expectations of Post-Modern Consumers and their Implications for Retailers

Consumer attributes	Desired consumer experience	Implications for businesses
Cynical	Integrity, honesty, transparency	Branding & corporate image of the retailers should always project high standards of integrity and ethics at all times. Transparent pricing showing that there are no hidden costs should be used.
Knowledgeable	Meaningfulness, appropriateness	Products must address specific lifestyle needs similar to the notion of compatibility (Rogers, 1995).
Time-poor	Relevance, convenience	Products must be simple to use and more importantly streamlined to provide only the relevant and necessary features, so as to enhance perceived ease-of-use, which invariably promotes perceived usefulness of products (Davis, 1989).
Tribal	Tribal validation – in line with significant others' expectations	Retailers must possess some knowledge of the customer's background and community. This will help in designing products that will live up to both consumers' and their communities' expectation (Taylor & Todd, 1995).
Individual	Customisation	Customising the product to suit specific needs of customers. Providing real value to customers and not just selling transactions. In other words, product should be useful to the customer (Davis, 1989).
Demandingness	Excellence	Moving away from the one-size-fits-all strategy and moving towards establishing customer needs and designing products to meet the needs.
Experience seeking	Participation, co-creation of value	Harnessing customers' needs to be part of (co-) production process. To ensure that the service provided is challenging, interesting and within the control of customers (Ajzen, 1991).

Source: Adapted from Shambare (2012)

The implication for online retailers is that they need to determine these attributes first and then devise strategies that address them. More importantly, as mentioned by Shambare (2012), it must be appreciated that the one-size-fits-all strategy is no longer applicable to modern consumers.

2.7.2. Access to Mobile Marketing Services in South Africa

Having discussed the state of mobile marketing within the South African retail environment in the previous section, it becomes imperative to further ascertain the actual access to mobile marketing services by South African citizens. It, therefore, culminates in the overall understanding of mobile marketing transactions adoption trends within the South African market, and ultimately predict consumers' decision-making process. Despite the fact that there is rapid penetration of mobile devices in Africa, adoption of m-Commerce in South Africa has been relatively slow. According to Molla and Licker (2005), m-Commerce adoption in developing countries has been constrained by the quality, availability, and cost of accessing such infrastructure. In addition, the authors also proffer that in most developing countries, Internet use and m-Commerce practices have yet to reach a critical mass as it is only within the reach of those who are affluent. Compounded by (1) digital divide (Wahab, 2003), (2) socio-economic inequalities (Allen, 2018), and (3) digital poverty (Barrantes, 2007), the extent to which the majority of South Africans are truly capable of leveraging mobile technology to enhance their marketing experience is blurred. The above three factors are discussed in detail below.

2.7.2.1. Digital Divide

Mobile technology, particularly the development of wireless Internet connections, has made it possible for businesses to transmit significant amounts of information across the globe instantaneously, which improves the conditions of the global economy thereby accelerating the growth of m-Commerce. However, according to Van Deursen and Helsper (2015: 38), 'amongst the many obstacles hindering the adoption of ICT in developing countries is the lack of sufficient and efficient technological infrastructure which represents the high water mark of the digital divide'. The phrase 'digital divide' has been applied to the gap that exists between those countries with ready access to the tools of information and communication technologies (ICTs), and those without such access or skills. Acknowledging the role of ICT, a report from the meeting of the High Level Panel on Information and Communication Technology (Rice, 2003: 76) has declared that 'developing countries have great potential to compete successfully in the new global market, but

unless they embrace the ICT revolution promptly and actively, they will face new barriers and the risk of not just being marginalized but completely bypassed'. Furthermore, in consonance with the former author, Chukwuemeka (2016) states that there is no doubting the fact that Africa is lagging way behind the rest of the world in terms of adoption of new technologies as the United States, Europe, and Asia have gone far in this sphere, leaving Africa trailing behind. For instance, as of 2017 (Onkokame, Chaenai, & Broc, 2018) only 21.8 per cent of African residents had used the Internet compared to 43.7 per cent in the Arab States, 43.9 per cent in the Asia/Pacific region, 79.6 per cent in Europe and 65.9 per cent in America. At the country level, however, South Africa has a relatively higher penetration rate (53.23 per cent) but the price of using daily mobile data optimally has remained persistently high. Therefore, the high costs of mobile broadband have not only reduced South Africa's potential of narrowing the digital divide but have inhibited the full extraction of potential digital dividends resulting from m-Commerce.

2.7.2.2. Socio-Economic Inequalities

South Africa's socio-economic history is unique, with few similarities to other countries (Meagher & Wilkinson, 2001; Faulkner et al., 2020). The country has an intricate and complicated history that includes colonisation from the Dutch and English settlers and the rise of the Boer nation and apartheid. This gave rise to a deeply divided and polarised country. Of note was the institutionalised policy of racial segregation and separation - apartheid - which forced black and white people to live separately from each other. These divisions transcended beyond racial classification (Shambare, 2012); they also defined and determined participation in and access to the economic resources. Despite being the majority, blacks were impoverished and marginalised with limited access to key services of the economy such as education and financial markets. Kirsten (2006) points out that apartheid policies helped create a highly segregated society divided along racial and economic lines. This segregation resulted in wider socio-economic inequalities between black and white, poor and rich, and the formal and informal segments of the population. According to Allen (2018), in a world increasingly spent 'online', South Africa's historical background has led to the previously segregated often finding technology expensive. They also usually lack quality education to support greater digital literacy, resulting in digital inequality. This assertion substantiates the postulation by Shambare (2014: 542) that 'the high cost of technology and the widespread existence of technology poverty on the continent implies that many in Africa cannot afford ICTs'. As a result of this low demand, 'the costs of marketing technologies for

businesses remain exorbitant, and because of this high cost, lack of affordability leads to reduced access, which in turn creates technologically poor consumers'.

2.7.2.3. Digital Poverty

The concept of 'digital poverty' (Barrantes, 2007), though not frequently mentioned in adoption studies, aids in the understanding of why there is a relatively slow uptake of innovative technologies in most developing countries. Contrary to the concept of digital divide, the digital poverty concept tries to find the minimum ICT use and consumption levels of the population necessary to demand ICT products. In this approach, digitally poor individuals lack the information and communications enabled by digital technologies (for instance, mobile marketing services) due to a lack of knowledge on how they are used, or a lack of income. As purported by Barrantes (2007), the following four variables can be used to explain constrained use and the placement of the poor individuals along the digital poverty spectrum shown in Figure 2.4:

I. **Age:** The hypothesis states that the older the person, the higher the likelihood that he/she will be digitally poor. Further, the digital poverty framework (DPF) argues that this relationship is explained to be a consequence of inadequate digital literacy and practical exposure to modern ICT.
II. **Education:** the hypothesis states that the higher the educational level the less likely it is that the individual will be a digitally poor person and the greater the chances of using ICT meaningfully to extract digital dividends (Barrantes, 2007: 35). This is supported by the understanding that the more educated individuals are, the more likely they are to be both aware of and motivated to extract gains from ICT usage (Van Dijk, 2006).
III. **Functionality Accomplished:** Functionality refers to the uses given to technology: from the mere reception of information to the full interaction involved with the use of the technology. Digitally poor individuals are mostly passive and do not take advantage of the enhanced functionality of digital technologies. Thus, passive users restrict themselves to basic interactions with ICT such as those associated with the traditional delivery-based functions of radios and telephones.
IV. **Available infrastructure:** In terms of functionality, available ICT infrastructure is conceived as the fourth key determinant for digital poverty, given the recognition that it is a necessary but insufficient requirement for retrieving digital dividends. More specifically, considering the prominence of convergence technology, the ownership of more traditional

mobile phones and ICT are positively related with digital poverty. The Internet, and access to more sophisticated forms of smart technology, are conversely positively associated with the satisfaction of ICT demand and meaningful ICT usage.

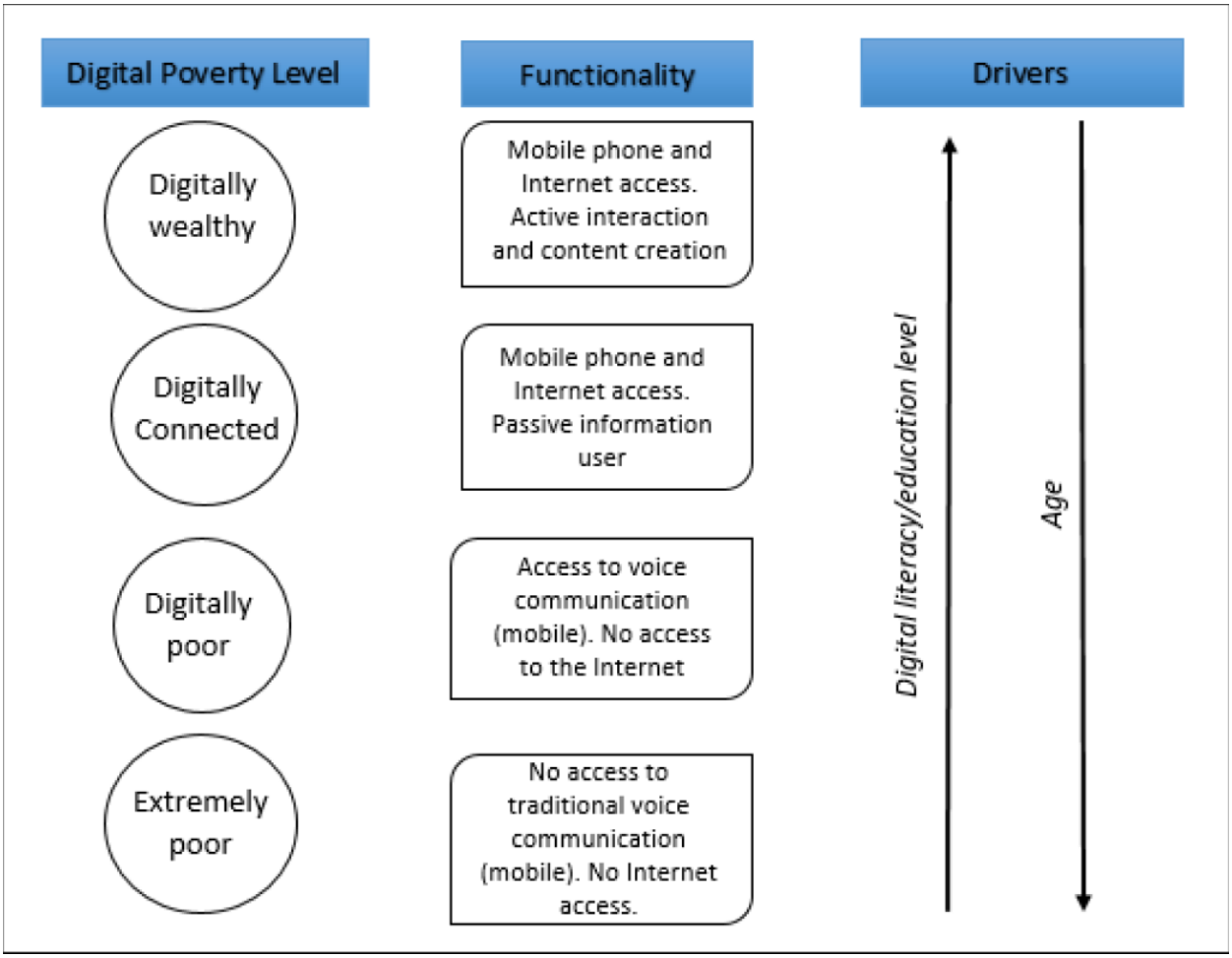


Figure 2.5: Digital Poverty Spectrum

Source: Adapted from Allen (2018)

May and Diga (2015) found out that most developing nations are currently characterised by fewer digitally wealthy individuals. The authors further single out low digital literacy stemming from low awareness of the importance of mobile phones for opportunities as a possible contributory factor. This finding is reinforced by Sinha and Hyma (2013) who highlight that when placed within the context of Africa and many developing countries, it is this lack of 'informational capabilities' which has been observed to hinder the poor from using digital ICT meaningfully. In addition, referring to the South African context, Allen (2018: 26) states that: "Given the reality of language barriers and

a lack of local content in mobile applications to match the 'cultural milieu' of given contexts, it is not surprising that weak digital skills are consequently attributed to not only low ICT adoption among the poor, but a lack of motivation to develop critical skills that are essential to using ICT actively in terms of content creation." This means that for successful diffusion and adoption of mobile marketing services, the digitally poor need to first have sufficient knowledge and comprehension to meaningfully engage with digital technology. As depicted on the digital poverty spectrum in Figure 2.4 the youth, and specifically students, fall under the digitally wealthy individuals who actively interact on the mobile platform. According to Blackwell, Miniard, and Engel (2006), the digitally wealthy consumers can fall either within the innovators or early adopters of the innovation stage. Consequently, Shambare and Donga (2019) propound that if marketers fail in winning adoption of innovation by innovators and early adopters, there is not much hope for the rest of the target market. Thus, the tertiary student market can be viewed as opinion leaders who possess strong capabilities of influencing innovation adoption to other adopter categories (early majority, late majority, and laggards). A detailed discussion of the adopter categories will be done in Chapter 3.

In an attempt to narrow the digital poverty gap in South Africa, this thesis contributes to the body of knowledge by analysing the youth market and the extent to which it adopts mobile marketing transactions. In doing so, this thesis produces findings which could directly inform marketers and researchers on how to effectively promote the diffusion and adoption of mobile marketing transactions among other segments within the digital poverty spectrum. The following section reviews how the youth, specifically the student market, utilises mobile technology for marketing purposes.

2.7.3. Students' Participation in Mobile Marketing

A substantial proportion of usage of mobile services in South Africa is the student population (Deloitte, 2013). In terms of spending within this segment, a study by iTouch, which consisted of university students in South Africa, showed that 53 per cent spent a minimum of R100 monthly on mobile charges (Donga, 2017). Moreover, as many as 86 per cent of the students at universities across South Africa are prepaid subscribers. Besides spending on mobile charges, the South African university students are following international trends and are becoming the fastest-growing users of mobile technology in the country. For marketers, this widespread adoption of mobile technology has represented a huge marketing opportunity to reach and serve

consumers anytime, anywhere (Persaud & Azhar, 2012). Furthermore, Yu (2013) claims that students constitute one of the most active consumer groups who are more exposed to many types of digital advertisements and, hence, are more likely influenced by marketing content than other consumer groups. Thus, research is needed to gain clearer insights into how students actually react to mobile marketing, given the consumer behavioural adjustments required when adopting innovative technologies.

Van der Waldt, Rebello, and Brown (2009) propounded one of the first among the current few studies on university students' behaviour towards mobile marketing in South Africa, though their study was mainly conducted when most respondents were using conventional mobile devices with limited capabilities. The authors found out that students' participation in mobile marketing was lower and they exhibited fairly negative attitudes towards mobile advertisements as the majority considered them irritating. This finding is reinforced by Beneke, Cumming, Stevens, and Versfeld (2010) who also establish that despite the success of mobile marketing (as indicated by the positive relationship between consumers' attitudes towards mobile marketing and purchase intentions), negative attitudes towards mobile marketing exist among South African students. However, the authors also suggest that by the time of the study m-Commerce was gaining momentum in South Africa and more research would be needed in order to confirm these tentative findings. Donga (2017) notes an increase in students' involvement in mobile marketing; however, many of the respondents still regarded most of the notifications as annoying. It was further established that most of the marketing notifications that were sent to students were not permission based and not highly relevant.

The South African students' engagement with mobile marketing appears not to be peculiar as some studies that where conducted in different context reported similar findings. For instance, in a study that was conducted in the UK, Grant and O'Donohoe (2007) established little to suggest that the student consumers welcomed the prospect of mobile marketing unless they received relatively infrequent and highly relevant content. The respondents further voiced concerns about the growing 'threat' of commercial intrusion through their mobile devices as most of marketing notifications they received were unsolicited. Furthermore, Strauss and Frost (2016) indicate that unlike individuals in the corporate sector who are more actively involved in mobile marketing, most students globally are not so much interested in reading mobile marketing messages despite being so much active on the mobile platform.

Even though the previous authors seem to suggest that students tend to have a weak openness for mobile marketing, Yu (2013) argues that message interactivity is an effective factor which can induce their intention to participate in mobile marketing transactions. In addition, Yang (2013) also establishes a positive relationship between social influences and students' behavioural intention to use mobile marketing services, implying that peers' opinions concerning mobile marketing services are important in consumers' adoption intentions. Similarly, Ismail and Razak (2011: 12534) emphasize that 'intention to use mobile marketing could be enhanced by stimulating social pressure, and youthful consumers prefer to follow their friends' opinions in the mobile marketing environment rather than their family'. Consistent with this finding Shambare, Rugimbana, and Zhowa (2012) conjectured that usage behaviour among students for mobile technology is largely shaped by social influence and peer group opinions. Consequently, one of the objectives for this study was to assess the influence of marketing-related mobile activity of sharing content (mostly among peers) on the adoption of mobile marketing transactions. Gao, Rohm, Sultan, and Huang (2012) suggest that mobile marketing with students may be effective when mobile marketing content is shared among consumers by their peers, rather than coming directly from a marketer.

Central to most contemporary studies on obstacles that hinder the successful adoption of mobile commerce is the issue of consumers' concern for security (Chau, Deng & Tay, 2020; Mallat, 2007; Kim, Tao, Shin, & Kim, 2010; Coursaris, Hassanein & Head, 2003; Khan, Talib, & Faisal, 2015). Several studies that composed of student respondents likewise seemed to have found the security concern as one of the most significant obstacles to successful mobile marketing adoption. For instance, Demir (2013) finds that students are reluctant to give personal information for using mobile marketing services and do not accept any information sharing made by brands or mobile network operators without their consent. Beneke (2012) also stresses that due to security concerns, consumers are more willing to give low-concern-level personal information (demographic, occupation and lifestyle information) as opposed to high-concern-level personal information (financial data and personal identifiers). It appears, then, that it is imperative for marketers to ensure that proper security mechanisms are embedded within any m-Commerce technologies in order to create positive consumer perceptions. Therefore, against this background, the security dimension also presents further impetus towards conducting the present study. A detailed discussion of the security issues is outlined in the following sections.

2.8. SECURITY THREATS IN MOBILE COMMERCE

The growth of the mobile web in South Africa and globally implies that more consumers than ever before are vulnerable to cybercrime as they access the Internet using their mobile phones, tablets, and other portable mobile devices. According to Cwele (2014), the top cyber services being targeted by criminals in South Africa are Internet banking, m-Commerce, and social media sites. Security breaches can weaken customer confidence and, at the same time, damage a brand's reputation. For this reason, South African organizations are under increasing pressure to build robust security into their products.

In 2014, The US Federal Bureau of Investigation (Tamarkin, 2014) listed South Africa as the sixth most active cybercrime country in the world, while informal consensus placed it third behind Russia and China. In the subsequent year, a study by Internet security company Norton established that almost 9 million South Africans were victims of cybercrime in the year 2015 (Fin24tech, 2016). A presentation made at the 2015 Security Summit held in Johannesburg (Kader & Minnaar, 2015) substantiated the findings by Norton as South Africa was revealed to suffer from more cybercriminal attacks when compared to other countries in Africa. John Nugent (Vicente, 2016), the senior analyst for Control Risks' Cyber Threat Intelligence identified four core drivers for SA's high risk for cybercrime: (1) the country's comparatively high levels of Internet connectivity, (2) the country's wealth and particularly its high GDP per capita compared to that of other nations in Sub-Saharan Africa, (3) the relatively poor levels of cyber security education and preparedness in the country, and (4) the South African law enforcement agencies being poorly equipped to prosecute the perpetrators of cyber-attacks.

There are various innovative cutting edge services executed over mobile networks - for instance, m-learning (Jaradat, 2014), m-health (Baig, GholamHosseini & Connolly, 2015), m-agriculture (Gichamba & Lukandu, 2012), and m-Commerce (Chong, 2013) - which have seen some nations enjoying economic transformation. This study, however, from a business perspective concerns itself with only security issues revolving around m-Commerce, specifically security issues affecting mobile marketing transactions. The problem is compounded with the ongoing trend in Africa, specifically in South Africa, towards information technology (IT) consumerization (Stagliano, DiPoalo & Coonnelly, 2013) which has resulted in more and more consumer-owned mobile devices connecting with the corporate network. According to Bailey, Del Miglio, and

Richter (2014), there has also been a rise in the cases of cyber-related attacks on businesses globally (See Table 2.4).

Table 2.4: Global Case studies of 2018 Commerce Related Cyber attacks

Source	Description of Attack	target	Country	Type of attack
Barth (2018)	A mobile malvertising campaign was detected targeting three digital advertising platforms has been using a malware, dubbed JuiceChecker-3PC, which checks a phone's battery level as part of an unusual new technique for avoiding detection.	Mobile users	Multiple countries	Cyber crime
Bloomberg (2018)	Bloomberg reported that an alleged attack by Chinese spies, carried out implanting a chip on Super Micro servers, reached almost 30 U.S. companies, including Amazon and Apple.	30 U.S. companies, including Amazon and Apple.	U. S	Cyber Espionage
Chong (2018	Maple Change, a Canadian crypto exchange, suffered a hack and lost all the funds worth $6M.	Financial Technology	Canada	Cyber crime
Cimpanu (2018)	The South African branch of Hetzner, a well-known web hosting provider, suffers a new security breach. The attacker managed to gain access to customer details such as names, email addresses, phone numbers, addresses, identity numbers, VAT numbers, and bank account numbers.	Information and communication	SA	Cyber crime
Gatlan (2018)	Researchers from Blueliv Team detected a new data stealer malware, dubbed ZeroEvil, targeting businesses in Canada	Multiple commercial Industries	Canada	Cyber crime
Hackbusters (2018)	5,000 people's personal information, who used a parking app, collected by Cork City Council, is illegally accessed by a hacker	Customers within the Cock city council	Ireland	Cyber crime
Reuters (2018)	Mauritius banking group SBM Holdings unveiled that its Indian operations suffered a cyber fraud, and that the bank had potentially lost up to $14 million worth. The bank however, was able to recover $10 million.	SBM Holdings (State Bank of Mauritius India)	India	Cyber crime

Source: Compiled for the study

The concept of security in m-Commerce is the most important aspect that a mobile-system should respond to (Niranjanamurthy, Kavyashree, Jagannath, & Chahar, 2013). For instance, in an online mobile transaction scenario, both the online retail and the consumer will want to authenticate each other before committing to a payment. Furthermore, the customer will want assurance about the delivery of goods or services, confidentiality, and integrity of sent payment information. The implementation of such a system without securing its environment, especially where transactions involve monetary value, is likely to cause serious conflicts between businesses and consumers (Niranjanamurthy, Kavyashree, Jagannath, & Bhargava, 2012). The study at hand identified this gap and thereby explores further the aspect of mobile security in the South African context. Since the study concerns itself with information-security effects on m-Commerce, specifically mobile marketing transactions, the review in the subsequent sections will centre on the scope of the study, beginning with defining mobile security.

2.8.1. Defining Mobile Security

Despite most wireless operations executed via hand-held mobile devices having incredibly transformed the manner in which we perform our daily routines and how we connect with other people, users need to be extremely cautious of possible security attacks surrounding the mobile platform (Laudon & Traver, 2017). Such security attacks are in the form of information leakages, malware, ransomware, spam, as well as electronic funds transfer fraud. These have devastating effects such as loss of money or privacy (Mahmood & Afzal, 2013). The authors further point out that even though many well-known cyber-security solutions are in place to counteract these attacks, the pace at which technology has been evolving is fast, rendering these solutions less effective. After undergoing an extensive review of literature (Garba, Armarego, Murray, & Kenworthy, 2015; Linck, Pousttchi, and Wiedemann, 2006) this study comprehensively defines mobile security as the protection of mobile applications and the networks they connect to from threats and vulnerabilities associated with wireless operations.

Mobile security has become increasingly important in recent years as the number of the devices in operation and the uses to which they are put have expanded dramatically. The upward trajectory in the number of mobile devices has resulted in more attacks being launched in the cyber-space than ever before; as of 2018, a staggering 230 000 samples of new malware were being launched daily (Cybint Cyber Solution, 2018). Furthermore, the Cybint Cyber Solution (2018) reported that the total economic cost of cybercrime committed globally had in 2018 added

up to over $1 trillion dollars, and was projected to reach $6 trillion dollars by 2021. It is these worrisome mobile cyber-attacks which lead to the realisation by the present researcher that m-Commerce is not fool proof to these cyber-attacks and thus is a phenomenon which requires research.

2.8.2. Security Concerns Surrounding Mobile Marketing Transactions

Batya, Kahn, and Howe (2000) and Shneiderman (2000) postulate that improving positive security and privacy perceptions are most important for sustained activity in m-Commerce. According to Das and Khan (2016) most users are oblivious about security issues on their phone apps as they believe that smartphone providers include built-in security protection. Nevertheless, while some security functionality has been programmed in, it is far from being perfect - especially in online stores' applications that are prime targets for hackers. For instance, Kera (2017) points out that most malware targeting mobile marketing applications makes its way onto victims' devices by tricking consumers to clicking on a text message, or by masquerading as an Adobe Flash app, popular game, or some other utility downloaded through third-party app stores. These Trojans typically start getting their hooks into the operation of legitimate apps, then overlay screens to mimic each of the apps they are meant to steal information from. When the user enters the information, it is sent off to the criminals' servers, the screen goes away, and the malicious application allows the legitimate app to open (Kera, 2017). The whole process looks genuine to the users.

A study conducted by Bhatnagar and Ghose (2004) claims that there are numerous consumers who do not prefer to purchase online because they are concerned about the security of their sensitive and detailed information. This security concern becomes one of the aspects which limit buying online. Cuneyt and Gautam (2004) on the other hand reveal that online shopping with advanced security mechanisms is trustworthy and often culminates in frequent online transactions on the web. It is commonly said that privacy and security have a negative impact on m-Commerce, such that the people who are concerned and insecure about online transactions would probably spend less (Reddy, 2012). Matea and Vojvodic (2014) state that a customer's risk concerns about online transactions is normally associated with online stores revealing private information, the possibility of fraud, and the incapability to touch and see the product itself before making the actual purchase. Marketers need to focus on their online security systems to be able to increase profits (Alwarimi, 2015); and every aspect of the security must be developed well to protect both

the customers and the marketers. Since this study surveyed a student population, it became essential to review their perceptions about online transactions.

2.8.2.1. Students' Security Perceptions about Online Transactions

Relating to online behaviour of the student market Chikurunhe, Kadyamatimba, and Munyoka (2018) proffer that the increased time spent by students online combined with current Internet trends such as social networking puts them at high risk of commercial cyber-attacks. Berube (2018) states that the Mystery Shopper scam is the most recent to be targeting students, typically via a job board or scholarship posting and unsolicited e-mails that promise to award students lucrative discounts and vouchers. According to statistics from USA National Consumers League (Moak, 2015), students are falling for promises of non-existent online merchandise. The most common complaints from students are that online sites advertise items such as trendy athletic apparel, game consoles, and smartphones - only to take money and never deliver. The tendency by students to fall for such scams can be attributed to lack of online shopping experience, inadequate income, and their preference for online inexpensive products (Nuntharmawia, 2018).

From the preceding discussion, it is apparent that trust between online businesses and consumers is central to any commercial transaction, more so in the case of mobile commerce. As such, for mobile marketing transactions to be adopted successfully, trust should be generated through relationships between transacting parties (Din, 2020). In the case of mobile commerce, the need for creating the trust in the consumer assumes extreme importance because of its virtual nature. It, therefore, hinges on businesses assuring consumers that their use of network services to conduct online transactions is secure and reliable. In addition, consumers should be able to verify important information about transactions and transacting parties such as origin, receipt, and integrity of information, and identification of parties dealt with (Gururajan, 2002). Taking this into account, it becomes essential for both businesses and consumers to be aware of the implications of conducting online mobile transactions as it will assist in the smooth operation of online businesses while triggering positive consumer behaviour. Examining barriers to adoption of mobile transactions Linck, Pousttchi, and Wiedemann (2006) indicate that the lack of perceived information security is the most frequently called reason for a refusal. Rogger and Celia (2004) share similar results. Little empirical research, however, has been undertaken to understand the nature of the concept *perceived information security* regarding m-Commerce and mobile

marketing transactions. Conscious of this, the subsequent section reviews the antecedent factors of perceived information security as they relate to this study.

2.8.3. Perceived Information Security and the Adoption of Mobile Marketing Transactions

In recent years (Bleier, Goldfarb & Tuckerc, 2020), researchers have begun to note the significance of gaining consumers' trust in relation to privacy and security for the mobile marketing communication channel to be adopted. Bauer, Barnes, Neumann, and Reichardt (2005) further elaborate that trust is the major factor behind consumers' willingness to receive marketing messages on their mobile devices. Trust also reduces fear towards adoption of mobile technologies and, consequently, promotes consumers' involvement in mobile marketing transactions. Davis, Sajtos, and Chaudhri (2011) posit that perceived information security is also closely linked to the concept of trust and mobile marketing. Chellapa and Pavlou (2002: 359) further define perceived information security as 'the subjective probability with which consumers believe that their personal information will not be viewed, stored, or manipulated during transit or storage by inappropriate parties, in a manner consistent with their confident expectations'. Within a consumer behavioural discourse, this definition is imperative, as it captures a personal anticipation which denotes a consumer's intuitive perception for risk assessment. Consumers tend to be concerned about the manipulation of their data, unauthorized access to data, and undesired tracking of usage patterns (Bauer et al., 2005) as this often leads to devastating cybercrime attacks.

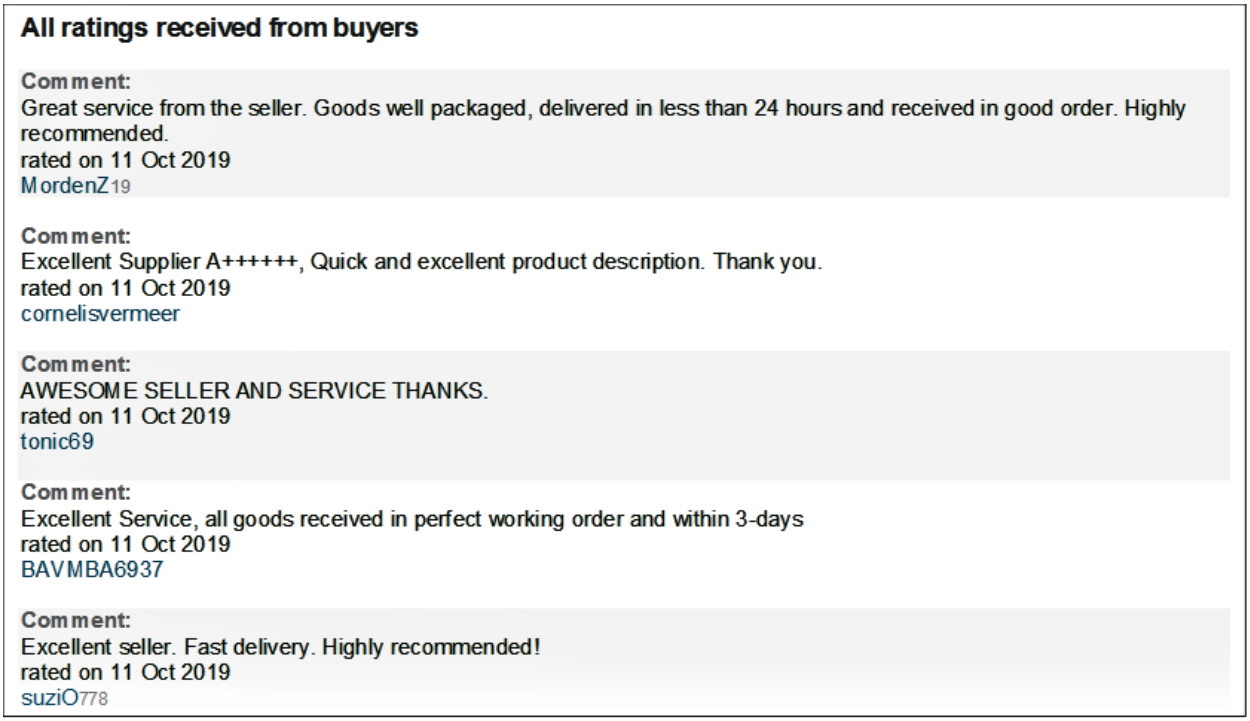
Leppäniemi, Sinisalo, and Karjaluoto (2006) point out that privacy issues arising from perceived information security threats forms part of important aspects in mobile marketing that need empirical investigation. Consequently, the future of m-Commerce depends on controlling information security threats, enhancing consumer security perceptions, and building trust. Does this mean information security is a new field or just another 'passing trend'? No, information security is neither new nor a 'passing trend'. What is new is its broader focus and wider appeal (Dlamini, Eloff & Eloff, 2009). For a long time, most businesses would not recognise the importance of securing the infrastructure that holds and transmits their strategic information with consumers. Information security has been treated as a by-product, if not as a necessary evil that hinders productivity (Conray-Murray, 2003). Businesses would do it merely because everybody else was doing it. However, slowly information security is getting into the forefront of things, and has been promoted from a by-product to an integral part of business operations (Conner &

Coviello, 2004; cited in Dlamini, Eloff & Eloff, 2009). Popovic and Hocenski (2010) state that the future of information security remains clouded with numerous uncertainties. However, two things remain certain (Cordesman & Cordesman, 2002): (1) IT infrastructures are vulnerable, and (2) motivated attackers are always ready to exploit these vulnerabilities. It is, therefore, critical that securing information and infrastructures should not be considered in fear of inevitable attacks, but also in preparation for the uncertain future. This requires innovative ideas and insightful analysis of security issues to appropriately respond to the challenges posed by latest developments.

In this study, perceived information security is considered an influential moderating factor affecting consumers' adoption of mobile marketing transactions. Three main antecedents of perceived information security: (1) verification, (2) authentication, and (3) protection are, according to Chellapa and Pavlou (2002), some the most influential on consumers' adoption of mobile marketing transactions. These mechanisms are derived from technological solutions to security threats that are visible to consumers and hence contribute to actual consumer perceptions towards the adoption of mobile marketing transactions. Thus, this study incorporated these three antecedents of perceived information security into the conceptual model (See Figure 1.1). These three antecedents of perceived information security are discussed next.

2.8.3.1. Verification

The most notable variance between mobile marketing transactions and conventional transactions is the absence of clear identity verification connected with the transactions (Chellapa & Pavlou, 2002). For example, being familiar with the Game Stores logo often satisfies consumers that indeed they are at the actual Game Store. In contrast, the case is not the same in the m-Commerce environment. It is not only simple for an individual to generate a deceptive Web site, but it is equally simple for a mischievous operator to build a Web site which is entirely fake. Without a doubt there are a number of sites that have indeed profited from typographical blunders (Velmurugan, 2012). As a result, in some cases when online customers are not familiar with the actual name of the domain, they may depend on trusted portals such as Yahoo in order to verify the domain name's accuracy (Yadav, Reddy, Reddy, & Ranjan, 2010). Another common strategy which is used by businesses in order to enable consumers to verify their websites is by means of testimonials. Testimonials are crucial to marketing success, especially in this age of viral posts and online reviews. According to Anusha (2016), testimonials are powerful trust signals that can go a long way in verifying online websites and enticing new customers to a business.



All ratings received from buyers

Comment:
Great service from the seller. Goods well packaged, delivered in less than 24 hours and received in good order. Highly recommended.
rated on 11 Oct 2019
MordenZ19

Comment:
Excellent Supplier A++++++, Quick and excellent product description. Thank you.
rated on 11 Oct 2019
cornelisvermeer

Comment:
AWESOME SELLER AND SERVICE THANKS.
rated on 11 Oct 2019
tonic69

Comment:
Excellent Service, all goods received in perfect working order and within 3-days
rated on 11 Oct 2019
BAVMBA6937

Comment:
Excellent seller. Fast delivery. Highly recommended!
rated on 11 Oct 2019
suziO778

Figure 2.6: Customer Testimonials

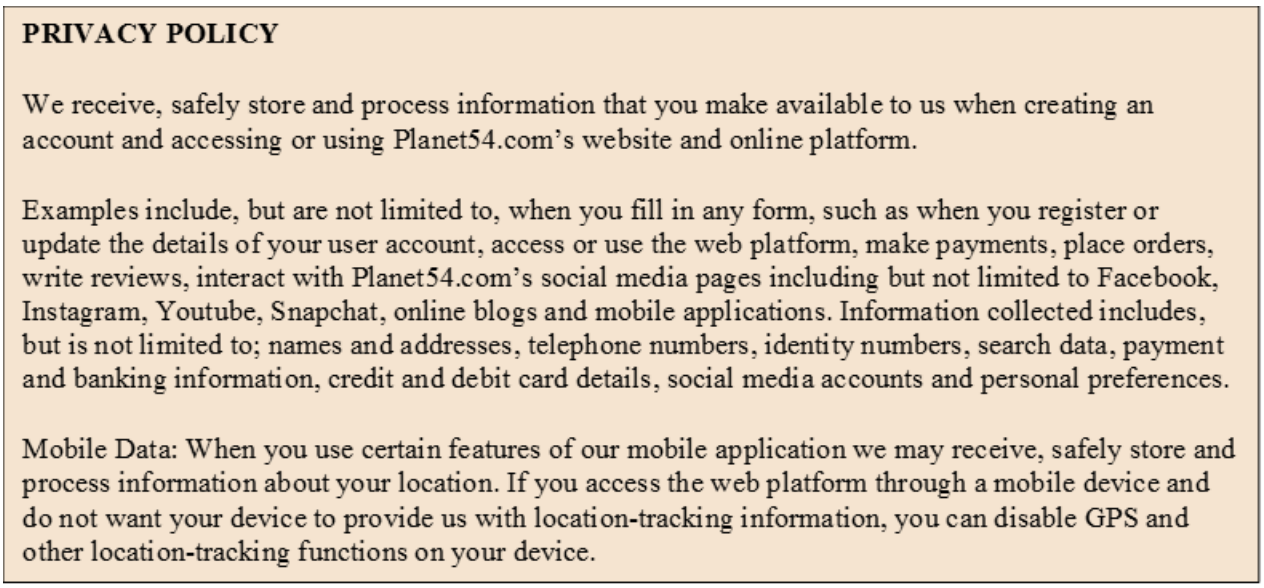
Source: Bidorbuy (2019)

The magnitude of verification (being a commonly encountered information security hurdle) should be expected to affect consumer adoption of mobile marketing transactions. Ponte, Carvajal-Trujillo, and Escobar-Rodríguez (2015) emphasise that the greater the consumers' perception that the website of an online merchant guarantees adequate verification during online transactions, the more likely they are to perceive that the website of the online seller is trustworthy. Thus, depending on the quality of verification mechanism on the website, a consumer may perceive that the site is or is not suitable for making the required online transaction correctly (Patton & Jøsang, 2004). In other words, when various websites contain information about similar products, clear verification measures induce consumers to opt for one particular website over the rest.

2.8.3.2. Protection

Protection can be regarded as the procedure (Chellapa & Pavlou, 2002) through which consumers are content with the fact that their individual information is suitably defended by the entity gathering the information. Disclosure of policies is one way to signal consumers' protection.

While these policies are largely concerned with the protection of privacy (See Figure 2.7), they also comprise guarantees concerning who is gathering the data and the way it is stored. Businesses normally implement the use of elegant firewall technologies in order to inhibit illegal invasions or attacks of their websites. Additionally, the consumers are made aware of common websites that have been maliciously hacked into through the media.



PRIVACY POLICY

We receive, safely store and process information that you make available to us when creating an account and accessing or using Planet54.com's website and online platform.

Examples include, but are not limited to, when you fill in any form, such as when you register or update the details of your user account, access or use the web platform, make payments, place orders, write reviews, interact with Planet54.com's social media pages including but not limited to Facebook, Instagram, Youtube, Snapchat, online blogs and mobile applications. Information collected includes, but is not limited to; names and addresses, telephone numbers, identity numbers, search data, payment and banking information, credit and debit card details, social media accounts and personal preferences.

Mobile Data: When you use certain features of our mobile application we may receive, safely store and process information about your location. If you access the web platform through a mobile device and do not want your device to provide us with location-tracking information, you can disable GPS and other location-tracking functions on your device.

Figure 2.7: Privacy Disclosure Policy

Source: Planet54 (2019)

When executing online mobile transactions, consumers are usually worried that their personal information and money is not properly protected and often likely to be transferred to a third party without their knowledge (Luarn and Lin, 2005). As such, Gitau and Nzuki (2014) assert that consumers' confidence about information privacy and security of a system may significantly influence adoption and usage of m-Commerce. This assertion substantiates an earlier study by Ming-Yen Teoh, Choy Chong, Lin, and Wei Chua (2013) which establishes that perceived protection acts as an important construct which affects consumer behaviour and determines the success of m-Commerce adoption. Thus, protection should also affect adoption of mobile marketing transactions.

2.8.3.3. Authentication

Defined, authentication (Ha, 2004) is the process through which a business trading online can be recognised through a trusted third party that assures that the business is definitely what it claims to be. Independent third parties provide these assurances. Consumers are usually familiarised to this mechanism through the availability of third-party seals (See Figure 2.8) on the entities' website, and also through the exchange of a digital certificate. Given that authentication is an additional clear distinctive mechanism for information security it, therefore, should moderate consumers' adoption of mobile marketing transactions.

Figure 2.8: Prominent Third Party Seals

Source: Adapted from CXL Institute (2017)

Third party authentication and Internet seals are an important means to convey a sense of safety to potential customers. For example, many online sites show their third-party seals (See Figure 2.8) to convince consumers that online transactions can be done safely. Similarly, online stores also display digital certificates on their homepage to relay authenticity. All these safety cues, as propounded by Kerkhof and van Noort (2010), serve to persuade customers that the online store is a safe environment to conduct a purchase. Aiken and Boush (2006), however, argue that most consumers are unfamiliar with the firms issuing third part authentication seals while some do not even understand their relevance and, as such, rendering third party seals less effective. Miyazaki and Krishnamurthy (2002) in their study coded the privacy policy compliance of 60 major commercial websites that displayed either a third-party privacy seal or no privacy seal. Their main

finding was that the actual privacy policy did not differ between seal holders and non-seal holders. In contrast, however, LaRose and Rifon (2006) compared 200 websites that either carried the Trust.e privacy seal, the BBBOnline seal, or no privacy seal; they established that websites displaying privacy seals were more secure than websites without privacy seals. These contrasting results necessitate further probing to shed more light on the effectiveness of authentication seals in creating a secure online retail environment.

As stated by Cho, Lee, & Chung (2010: 43) while numerous studies 'have examined the affective and behavioural dimensions of online security (e.g., privacy concerns or self-protection behaviours), surprisingly little is known about a central cognitive aspect of information privacy, namely why and how Internet users come to believe that they (or others) are vulnerable to information privacy risks'. Judgments on one's vulnerability to information privacy risk, conceptualised as *perceived information security*, is a central construct in most decision-oriented theories and has been found to exert significant effects on people's attitudes, trust, intentions, and behaviours in the context of consumer decision making (Benson, Saridakis, Tennakoon, & Ezingeard, 2015; Chellapa & Pavlou, 2002). Therefore, understanding how consumers construct their judgments about online information security risks is essential to the analysis of how they respond to online mobile marketing transactions.

2.9. CHAPTER SUMMARY

In this chapter, the general trends of the m-Commerce sector as well as the specific South African mobile marketing context were discussed. More importantly, the relevance of ICT in retail offerings was emphasised, in particular how these facilitate consumer transformation in mobile marketing and strategy formulation. The current state of access to mobile marketing services in South Africa was also pointed out. Finally, some security challenges surrounding mobile marketing were discussed in detail. These invariably provide the platform on which the theoretical discussion in Chapter 3 is based, assessing the factors influencing adoption and usage patterns of these innovations.

CHAPTER THREE

CONCEPTUAL FRAME DEVELOPMENT

3.1. CHAPTER OVERVIEW

Following on from Chapter 2, this chapter continues with the presentation of the research issues as they relate to this thesis. The various aspects, including the transformation of the purchasing pattern in contemporary marketing as well as the consumer decision making process, are discussed. Special emphasis is placed on factors identified in the literature as major influencers of adoption behaviour related to marketing technological innovations. Subsequently, the selection of the research's underpinning theory is presented, which culminates in the presentation of the conceptual framework which guided the study. Figure 3.1 outlines the sequence of the rest of the chapter.

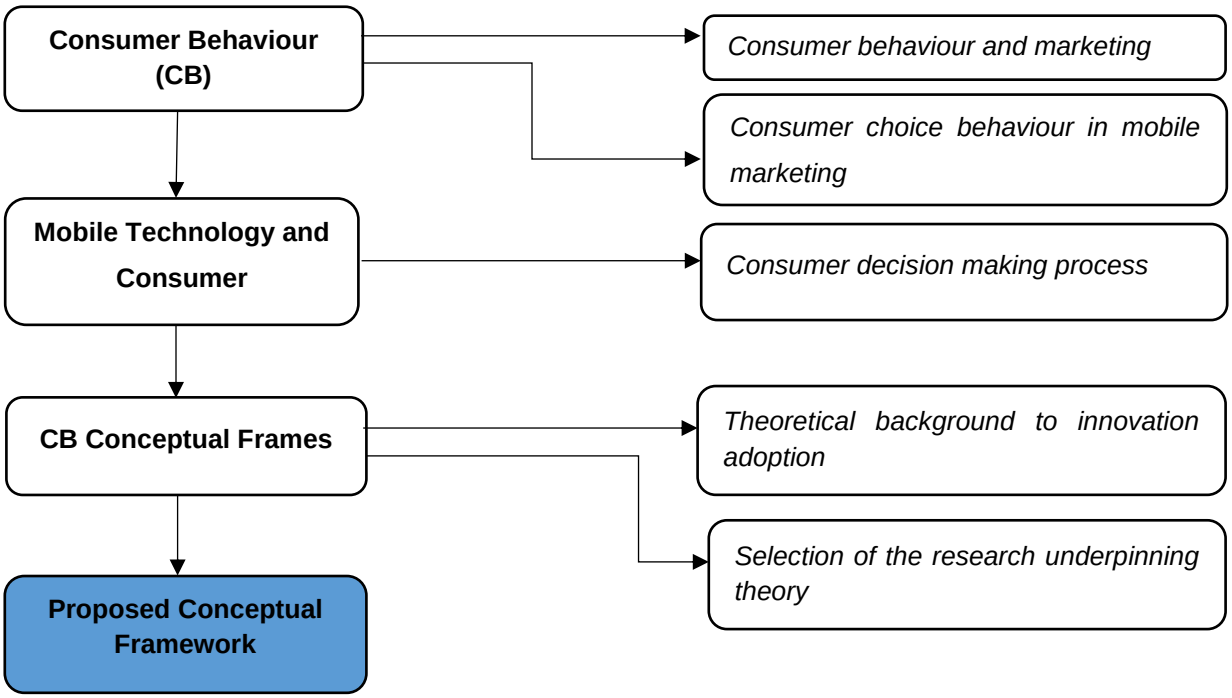


Figure 3.1: Structure of the Conceptual Literature Review

Source: Developed for this research

3.2. INTRODUCTION

While a business cannot survive without marketing it, on the other hand, will only gain competitive advantage by anticipating consumer reactions to its marketing strategy (Babakus, Eroglu & Yavas, 2004; Olson, Slater, Hult & Olson, 2018). For that reason, a great deal of consumer choice behaviour (CCB) research effort revolves around understanding the motives for and drivers of consumption. Past literature demonstrates that although consumers are often faced with difficult decisions, marketing managers on the other hand are faced with an even more arduous task – that of decoding consumer decision making processes and predicting consumer choice behaviour (Shambare, 2012). Clearly, marketers' interests lie in not only conceptualising 'choice' itself, but also understanding how consumers go about making individual purchase decisions. Understanding consumer behaviour for online marketing services and choice of transacting with a particular online store has long intrigued the minds of scholars and practitioners (Rahman, Khan, & Iqbal, 2018). Marketing services offered online are not only intangible and fairly complex, but many consumers can also perceive them as high-risk transactions.

Naz (2019) argues that despite many attempts, a generalizable conceptual framework which adequately captures the dynamics of consumer decision making for marketing services and online retailers is yet to be developed. There seems to be a consensus that the buyer behaviour models developed earlier examine this behaviour solely as a decision process, which consists of a number of discrete but interlinked stages (Devlin & Yeung, 2001). While a substantial number of studies recognize the importance of choice criteria determination and evaluation in m-Commerce adoption decisions, most focus only on the initial innovation attribute level (Chong, Chan, & Ooi, 2012; Kapoor, Dwivedi, & Williams, 2013; Lin, 2011). This approach, while useful at the beginning stages of the investigation, neither adequately captures the important higher-level abstractions nor provides managers with proper actionable strategic directions as the lack of consistently used measures of innovation characteristics has continued to hamper progress (Flight, D'Souza, & Allaway, 2011).

The present study addresses this void and responds to the call of Lichtenstein and Williamson (2006) for models which offer a deeper analysis of adoption decisions in mobile commerce by developing and testing a model that expands the domain of inquiry beyond the initial innovation attribute level. Rooted in the information seeking behaviour literature (Detlor, Sproule & Gupta, 2003; Weiler, 2005; Zolkepli & Kamarulzaman, 2011), the proposed conceptual framework

intends to highlight the antecedents of marketing services adoption in the mobile commerce setting where long-term customer involvement is evident. Managerially, the goal is to provide mobile retailers with recommendations that enable them to better understand and finely customise their strategies to the ever-evolving online retail environment.

3.3. CONSUMER BEHAVIOUR AND MARKETING

In marketing, the significance of consumer behaviour is clearly realised in the description of consumer behaviour proffered by Kardes (2002:5) that 'consumer behaviour is the study of human responses to products, services, and the marketing of products and services'. Similarly, Hoyer and MacInnis (2001:19) advance that 'consumer behaviour provides critical information to marketing managers for developing marketing strategies and tactics'. To simplify their notion, the authors adopted Kotler's (2012: 89) typical classification of marketing whereby marketing is defined as 'a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others'. Consistent with the above definition, Loudon and Bitta (1993:9) assert that marketing is 'the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchange that satisfies individual and organisational objectives'. Baker (1994:101) postulates that needs are 'essentially physiological and instinctive; but that such basic desires are subject to change by other factors resulting in specific wants'. Furthermore, the author distinguishes these other factors as psycho-sociological and/or socio-psychological, and goes on to state that collectively, the study of these influences or factors has created a whole new field of marketing, usually referred to as 'Consumer Behaviour'.

A robust appreciation of consumer behaviour is fundamental for the accomplishment of marketing plans and strategies and, more importantly, for the firm's existence. Consumer behaviour thus can be regarded as the basis of marketing concepts. These marketing concepts can be considered as three inter-linked orientations, namely: customer needs and wants, the business's objectives, and integrated strategy (Loudon & Bitta, 1993; Armstrong, Kotler, Harker & Brennan, 2018). Marketers tend to detect consumers' needs and wants and offer goods and services as a way of sustaining those needs and wants. Since consumers have unlimited needs and wants, firms normally set their objectives in a manner that would effectively allow them to utilise their resources and gain competitive advantage while serving consumers' needs and wants. Finally, through consumer satisfaction, marketers can adopt an integrated strategy that would be most

efficient and effective in attaining the firm's goals. Furthermore, a sound appreciation of consumer behaviour is vital in searching for market opportunities, in establishing an appropriate marketing mix and in locating the right target market. For instance, Sowdagur (2006: 53) points out that it is important for the marketer 'to know how the consumer behaves and how he would respond to the marketing mix, namely product, place, price, and promotion, before formulating a marketing strategy'.

Scholars (Chee, Yee, & Saudi, 2018; Solomon, Dahl, White, Zaichkowsky, & Polegato, 2014) have, however, argued that the integration of technology in contemporary marketing practices has presented a remarkable rate of change in both the expansion of marketing services and the escalation of prospects for improved consumer experiences. For instance, Cantallops and Salvi (2014) mention that information technology advancements and the introduction of innovative communication methods have resulted in substantial consumer behaviour changes. Consequently, these changes have forced marketers to shift their marketing strategies as today's consumers are more complex and demanding. Thus, to ascertain the capability of the mobile marketing medium, marketers need to be aware of the uniqueness of this channel, building a technology to reach out to consumers, and continuously assessing the manner in which consumers interact with this channel. The subsequent section highlights how the emergence of mobile marketing technology has transformed consumer choice behaviour.

3.3.1. Consumer Choice Behaviour in Mobile Marketing

The process in which consumers are evaluating purchasing decisions has transformed with the rapid adoption of technology and, as such, an understanding of the manner in which consumers make decisions is critical in contemporary consumer behaviour research. Kumar, Bezawada, Rishika, Janakiraman, and Kannan (2016) argue that the significant changes in ICT have triggered businesses to embrace mobile marketing as a channel to communicate with consumers. Therefore, understanding consumer behaviour in mobile marketing is fundamental for the success of marketing as consumers are now increasingly resorting to the Internet and online social tools as product information sources. From the time when Internet was introduced, consumers have aggressively utilised it to look for specific information pertaining to products or services. In addition, consumers also use it as a source of reference and to evaluate reviews of their peers' experiences in order to make informative decisions. Through mobile marketing, consumers are evolving and no longer generate purchasing decision in a linear approach, which often decreases

chances of retailers realising sales with each passing step of the process. According to Heitzman (2018), the linear approach applied to most conventional firms and it encompassed a consumer becoming aware of a product or service, for instance, through billboards and print ads, contacting the retailer and thinking their purchase over for some time after acquiring a quote, and an ultimate purchase decision.

The advancements in technology and mobile practices have, however, streamlined each step of consumer behaviour as customers can now go online and purchase products in a short period of time. In addition, if consumers need to evaluate products or services, they can now conduct online research, evaluate product reviews from other consumers, visit a store to examine a product, and even watch product demos prior to conducting a purchase. According to Heitzman (2018), it is that kind of convenience that has transformed the business model from its conventional and linear approach into a continuously moving target with search as well as digital marketing at the midpoint (See Figure 3.2). While the manner in which customers execute purchases has been abridged by mobile marketing (i.e., lesser steps, power of purchasing at the click of a button), the ways in which they reach and interact with firms has multiplied. Furthermore, unlike previously, the rise of mobile marketing globally has also afforded customers with more control and choices of their consumption (Bright & Daughertly, 2012).

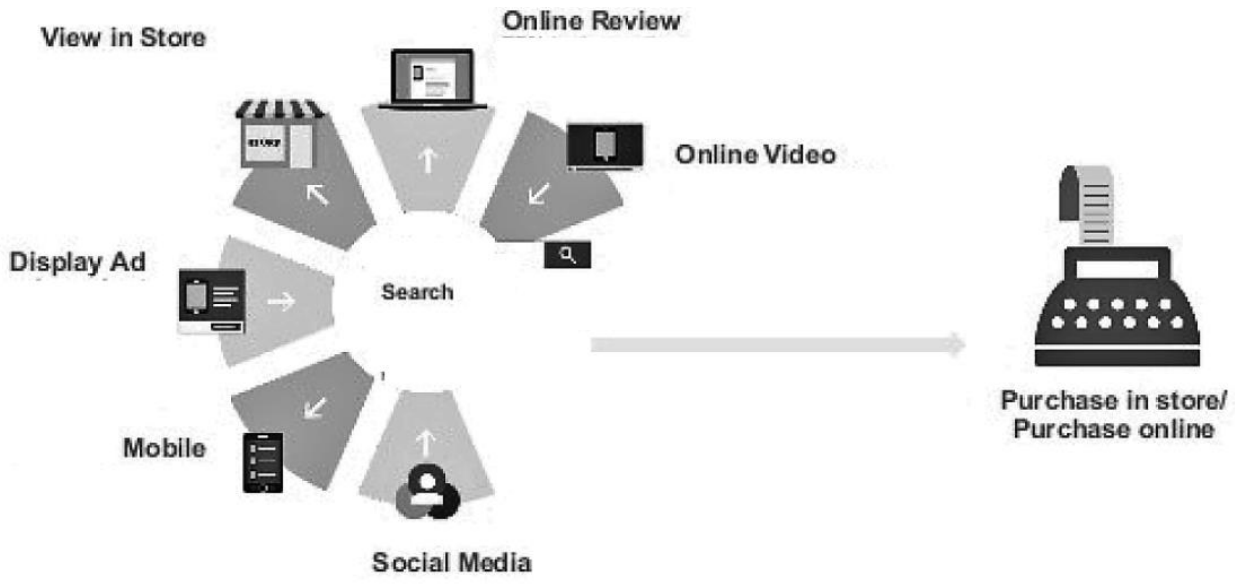


Figure 3.2: Digital Centred Marketing

Source: Adapted from Heitzman (2018)

Abidi (2012) states that one of the most imperative models from the consumer choice behaviour theory narrates the consumer decision-making process and it offers a framework of analysing how mobile technology influences the consumer buying patterns. The model highlights five major steps that consumers follow when purchasing a product (Peter, Olson, & Grunert,1999; Anjana, 2018): (1) recognition of a need, (2) information search, (3) evaluation of alternatives, (4) purchase, and (5) post-purchase evaluation. The model proposes that first consumers progress from a state of deprival (problem recognition), to the quest for information on solutions to the problem. The gathered information necessitates the basis for evaluating alternatives and after comparing such alternatives consumers make the actual buying decision. Lastly, post-purchase behaviour is fundamental from the marketing perspective, as it ultimately influences customers' perception of satisfaction/dissatisfaction with regards to a product or service (Jenyo & Soyoye, 2015). The effect of mobile technology can easily be seen at every stage of the decision-making process and it is explained in detail in the subsequent section.

3.4. MOBILE TECHNOLOGY AND CONSUMER TRANSFORMATION

Reddy (2016) states that consumers constantly evaluate potential purchases in the market and the proliferation in mobile technology has increased consumer expectation of interactive visual experiences when searching for product information. Findings by Powers, Advincula, Austin, Graiko, and Snyder (2012) also reveal that consumers utilise mobile technology to collect information regarding possible purchases and to inform them about new products, and can also convince them to have a mind-set change pertaining to a specific brand. Owing to digital connectedness and the period spent on mobile devices by consumers, they now consider shopping as an activity that can be executed at any time regardless of location (Reddy, 2016). A study by Xie and Lee (2015) indicates that increased online exposure by consumers to a brand in turn increases the probability of the consumers purchasing that particular brand. This is reinforced by the Global Online Consumer Report (2017) which establishes that 53 per cent of customers get their information from online sources such as social media, firms' websites, and peer review before buying a product. As mentioned earlier, the consumer decision making process (See Figure 3.3) is an integral process that informs consumer habits when making purchasing decisions. The ensuing discussion highlights in detail how mobile technology influences consumer choice behaviour.

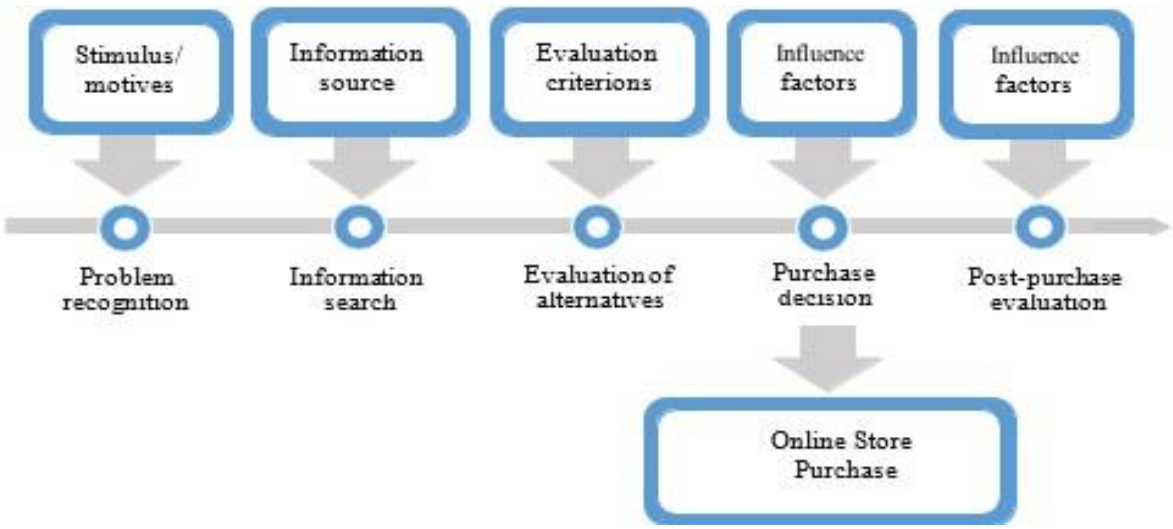


Figure 3.3: Consumer Decision Making Process

Source: Adapted from: Reddy (2016)

Stage One: Problem Recognition - According to Kotler and Keller (2012) the consumer purchase process begins at the problem recognition stage. A problem is identified when the consumer's existing state differs from their ideal state. Through advertising, retailers initiate the decision-making process and seek to induce problem recognition among consumers. This is done by creating a new ideal state for consumers or creating dissatisfaction with the consumers' current state (Reddy, 2016). Prior to the introduction of digital marketing, it would often take a longer period to motivate problem recognition but with the coming of digital marketing, consumers are now well informed as they are constantly on the lookout for new products or services on their mobile devices. Furthermore, online marketing's influence at the problem recognition stage has immensely improved as consumers are now able to get online marketing experience that has a combination of functionality and information on products and services.

Stage Two: Information Search - At the information search stage, consumers gather necessary information about different brands and their features and by so doing they will be attending to the problem recognised (Kotler & Keller, 2012). A consumer's information search process is internal and external: the internal is information in the consumer's memory while the external is the sources of information through marketing. As consumers gather information, few brands become strong contenders for the final choice to be made (Reddy, 2016). Mobile marketing has triggered consumer decision making by reducing search costs and potentially increasing the number of alternatives consumers can efficiently consider. Hence, firms should identify the consumers'

choices to search for information in the digital space and prepare marketing initiatives that will reach out to the consumer. According to Macdermott (2015) consumers nowadays have less trust in salespeople and their pitches as well as some traditional marketing channels and tend to swing towards finding out their own information relating to products or services online via their mobile devices.

Stage Three: Evaluation of Alternatives - As depicted in Figure 3.3, the third step in the decision making process is the evaluation of alternatives, whereby consumers evaluate product brand alternatives to acquire benefits and satisfy their needs. Kotler and Keller (2012) imply that attitudes and beliefs acquired through experiences and learning influence consumer choice behaviour and play a significant role in the evaluation of alternatives. One common mechanism which has greatly facilitated evaluation of alternatives online is the use of shopping bots which represent specialised search robots designed to locate and compare products. Rowley (2000: 204) state that 'shopping bots use the Internet user's query, visit Internet shops (sites) which may have the required product, retrieve the information and present it in a consolidated and compact format that allows comparison shopping at a glance'. The Internet hence shortens the consumer decision making process by almost integrating various stages of the process. For instance, instead of having to still visit a store to purchase the selected product after alternative evaluation, the consumer can proceed to purchase the product with the click of a few buttons (Rowley, 2000).

Stage Four: Purchase Decision - Evaluation of alternatives prompt consumers to make some purchase decisions as they would have derived some preferences among the brands considered. Comparing with traditional marketing, digital marketing has been so influential in evoking positive purchasing decisions among consumers through its ability to interact with consumers in real time. A strategy often employed by online merchants to encourage consumers to purchase during this stage is by offering real time discounts. Discounts offered by online merchants to encourage purchasing often include free shipping of goods, discounts on first-time buyers, free gifts with purchases, and online coupons. Jenyo Gabriel and Soyoye Kolapo (2015) state that consumers are much more available to receive marketing messages due to the 'always-on' environment created by mobile devices, which results in lesser time required to make a purchase decision.

Stage Five: Post Purchase Behaviour - Post purchase behaviour is the final step in the decision making process and involves the level of dissatisfaction or satisfaction derived from the experience of consumers after purchasing a product (Reddy, 2016). Dissatisfied consumers will

return and complain about the product, whilst satisfied consumers promote the product and are likely to make further purchases of the product. A firms' response to consumer complains plays a fundamental role in its success. Noel (2009: 76) suggests that on average 'a dissatisfied consumer shares their views with approximately ten other individuals'. Digital media connects consumers and provides a platform for consumers to air their views, so firms need to monitor post purchase behaviours via these channels to attend to consumers' complaints and enable the retention and attraction of consumers. In addition, firms can use information derived from post purchase behaviour to understand consumers and build a relationship to entrench them and avoid consumer brand switching.

From the foregoing discussion, it is clear that, contemporary consumers are increasingly in control of when, how, and what marketing content they want to consume. Thus, consumers are no longer captive and passive receivers of messages sent by marketers, but can now participate in creating messages, actively selecting the information they want to receive, and avoiding any unwanted and untimely marketing messages (Higgs & Polonsky, 2007). Furthermore, through mobile marketing, consumers can now engage in a dialogue with not only the online retailers, but they can also connect and communicate with each other (Ewing, 2009)

3.5. THEORETICAL BACKGROUND RELATED TO THE ADOPTION AND USAGE OF TECHNOLOGICAL INNOVATIONS

Consumers' adoption of mobile technology has gathered a lot of attention since the introduction of information technology (IT) into the commercial world (Bhatiasevi, 2015; Meuter, Bitner, Ostrom, & Brown, 2005; Nysveen, Pedersen, & Thorbjornsen, 2005; Persaud & Azhar, 2012). Hoenig (1995) as well as Lai (2016) note that the rate at which commercial systems develop depends largely on a struggle between rapid technological change and natural barriers to new product or service adoption. Furthermore, scholars and practitioners alike are fascinated by establishing the factors affecting consumers' beliefs, attitudes, and perceptions towards mobile technology adoption (Lee, Kozar, & Larsen, 2003). As a result, a number of theories have proposed to explain consumers' acceptance of new technologies and their usage behaviour. Bhatiasevi (2015) posits that for the past two decades there have been many studies (c.f., Gong & Li, 2008; Holden & Karsh, 2010; Sultan, Rohm, & Gao, 2009; Venkatesh, Morris, Davis, & Davis, 2003) which have contributed with theoretical frameworks and models concerning the adoption of information technology (IT).

While there are numerous theories to the adoption of technology, this study will focus mainly on those that have been commonly utilised in studying adoption of mobile commerce innovations. These include, but are not restricted to, the Technology Acceptance Model (TAM) (Davis, 1989), Innovation Diffusion Theory (IDT) (Rogers, 1962), Theory of Reasoned Action (TRA) (Fishbein, 1979), Theory of Planned Behaviour (TPB) (Ajzen, 1985) and the Unified Theory of Acceptance and use of Technology (UTAUT) by Venkatesh et al. (2003). Hsu, Lu, and Hsu (2007), as well as Lee, Hsieh, and Hsu (2011) allude that of all the theories, TAM and IDT are the most common theories employed for describing consumers' adoption of information systems. The afore-mentioned common innovation adoption theories are discussed thoroughly in the following sections.

3.5.1. Rogers's Innovation Diffusion Theory (IDT)

Rogers's diffusion theory (1962; 1983; 1995) is based on the notion that consumers' perceptions and beliefs relating to a product determine its rate of adoption. In other words, the perceived characteristics of an innovation determine its potential to be accepted by individuals and, therefore, how it diffuses in society (Rogers, 1995; Hamad, Petri & Kwan, 2017). If these attributes are perceived favourably, then adoption is likely to take place. On the other hand, if the consumer fails to see any benefits or positive characteristics pertaining to the product, then adoption will less likely take place. According to the framework, adoption takes place through five distinct steps, as discussed in Table 3.1.

Table 3.1: IDT Adoption Stages

Stage	Implication
Knowledge	During this stage an adopter is exposed to an innovation or its existence and gains some understanding of how it functions. Knowledge can take place intentionally, whereby the adopter actively seeks for solutions to a problem. **Example**: a disabled student might be looking for a gadget that can perform multiple tasks (music, camera, voice recorder, calculations) and go to a local electronics shop to see if they have such a product. Similarly, the individual may come across the innovation by chance – an individual accidentally learns of innovation through others. **Example**: an individual sees a friend using Google glass and immediately feels he should also acquire the technology.
Persuasion	After being familiarised to the product or innovation, the adopter may gather some information pertaining to the product. The individual uses this information, including past experiences, hunches, and feelings, to develop a favourable or unfavourable attitude towards the product.
Decision	After consultation with self and others, the adopter makes a conscious decision whether to adopt or reject the product.
Implementation	At this stage, the potential adopter puts the product into use. Also at the implementation stage, the individual will consult information for effective implementation (e.g. from operation manuals or booklets).
Confirmation	Thereafter, the adopter seeks to reinforce the decision to either adopt or reject the innovation. At this stage, the consumer becomes either satisfied or fails to be satisfied by the performance of the new technology.

Source: Adapted from Rogers (1995)

From Table 3.1, it can be concluded that adoption should not be seen as a single event but a continuous series of cognitive processes (Shambare, 2012). This assertion is substantiated by Rogers (1995: 16) who elaborates that innovations 'that are perceived by individuals as having greater relative advantage, compatibility, and trialability but less complexity will be adopted more rapidly than other innovations. Past research indicates that these five qualities are the most important characteristics of innovations in explaining the rate of adoption'. In the mobile commerce sector in particular, Rogers' model has been useful in conceptualising the adoption patterns of mobile marketing services such as mobile coupons (Dix, Ferguson, Im, & Ha, 2012), location-based marketing (Wu, Kao & Yang, 2012) and mobile payments (Ibidunmoye, 2018). Effectively, when making the adoption-rejection decision, potential adopters evaluate five key attributes: relative advantage, complexity, compatibility, trialability, and observability. These characteristics determine whether or not the new product will be useful to the consumer. The innovation characteristics, as postulated, are defined next.

3.5.1.1. Relative advantage

The relative advantage associated with a new innovation demonstrates its additional benefits over substitutes. If adopted, consumers will derive more advantages from the product; hence an innovation's relative advantage is positively related to its rate of adoption (Agarwal and Prasad, 1998). In the context of mobile marketing services adoption, therefore, is in part determined by their relative advantage over traditional marketing channels such as convenience, wider coverage, and location awareness.

3.5.1.2. Perceived compatibility

The extent to which consumers distinguish themselves and define their lives in relation to their environment and personal ambitions defines their self-concept (Hawkins, Best & Coney, 2001; Hussain, Qazi, Ahmed, Vveinhardt & Streimikiene, 2019). Likewise, lifestyle is shaped by the manner in which they live that identified self-concept. Compatibility of a new innovation, therefore, is defined by how well suited a product is to a consumer's lifestyle, values, and needs. The compatibility construct, since it facilitates consumers in identifying and projecting their 'perceived self-image', is directly related to its rate of adoption (Meuter at al., 2005). Consequently, consumers who view mobile marketing services as being closely aligned with their sense of self will most likely adopt them.

3.5.1.3. Complexity

Complexity of an innovation denotes the extent to which an innovation is perceived by consumers to be difficult and complicated to use or understand (Joachim, Spieth, & Heidenreich, 2018). Because individuals typically resist change and adjustment in behaviour patterns, the more complicated a product seems, the less likely the product will be adopted. Complexity is related to the nature of the innovation. For instance, in the case of continuous innovation (improvements to existing products), the degree of complexity is inversely related to the rate of adoption since the innovation is used in much the same manner as the products before it. Innovations that are perceived as dynamically continuous (innovations that often involve the introduction of a new, different, or better technology) have a pronounced effect on consumers' behaviour pattern. If placed on a continuum of level of ease/difficulty to learn, dynamically continuous innovations - for example smart phones - fall somewhat in the middle of the continuum, possessing low to

moderate complexity. A discontinuous innovation (mostly new products), on the other hand, requires consumers to adopt new behavioural patterns and is perceived as more complex, as a result taking longer to be adopted by consumers (Shambare & Donga, 2019). When it was first introduced, the Internet was an example of a discontinuous innovation.

3.5.1.4. Trialability

Trialability is the extent to which consumers are afforded the opportunity to try out new innovations prior to purchase. For instance, Avast is a popular Internet security software firm well-known for its value-for-money online antivirus protection service. By offering a new customer a 30-day free Avast antivirus trial, they are hoping those who sign up for the trial will end up being a customer. In their research, Tan and Teo (2000) found that customers afforded the opportunity to experiment with the innovation prior to purchase are more likely to adopt the product than those who do not. Thus, the adoption of mobile marketing technologies is more likely if the services are first demonstrated to mobile customers.

3.5.1.5. Observability

The last characteristic of innovations as highlighted by Rogers (1962; 1995) is observability. This is defined as 'the degree to which the results of an innovation are visible to others'. Similar to relative advantage, compatibility, and trialability, observability is also positively correlated with the rate of adoption of an innovation. The chances of innovation adoption are greater if people can easily observe the functionality of the new technology. In fact, after some adopt, observability can improve the diffusion effect, a critical component of technology transfer. Thus, when new products are highly visible, it drives more people to share and this increases the likelihood of mass adoption (Burkus, 2013).

With the exception of complexity, the other four characteristics demonstrate positive correlation with the rate of adoption of innovations. Although Rogers (1995) identifies five key predictors of adoption, recent studies confirm that only three of these: relative advantage, compatibility, and complexity consistently prove to be stable predictors of adoption, across multiple disciplines (Agarwal & Prasad, 1998; Davis, 1989; Meuter et al., 2005; Rugimbana & Iversen, 1994). Since these contribute the most variance in adoption, it is not uncommon for recent studies to only utilise these three constructs of the IDT framework for obvious reasons (Meuter et al., 2005). Rogers

(2002) emphasises that despite innovation characteristics being important determinants of adoption of the innovation, the process manifests itself in different ways and is highly subject to the type of adopters and innovation decision process. Thus, adoption does not happen simultaneously within a society; rather it is a process whereby some people are more apt to adopt the innovation than others. To illustrate this notion the next section discusses the characteristics of five different adopter categories (Rogers, 2003) as they relate to innovation adoption.

3.5.2. Characteristics of Adopter Categories

Laukkanen & Pasanen (2008: 92) point out that people who adopt an innovation early 'have different characteristics than people who adopt an innovation later' and when promoting an innovation to a target population, it is important to understand the characteristics of the target population that will help or hinder adoption of the innovation. As mentioned earlier, there are five established adopter categories, summarised in Table 3.2, and while the majority of the general population tends to fall in the middle categories (Rogers, 2003), it is still necessary to understand the characteristics of the target population.

Table 3.2: Characteristics of Adopter Categories

Adopter segment	Typical characteristics
Innovators (the first 2,5% to adopt the innovation)	Risk takers; highly educated; use numerous, diverse information sources
Early adopters (the next 13,5% to adopt the innovation)	High social status; strong opinion leaders; slightly above-average education level; more careful in adoption choices when compared to innovators
Early majority (next 34% to adopt the innovation)	Consider adoption of innovation after the innovators and early adopters; above average social status; seldom hold opinion leadership positions
Late majority (next 34% to adopt the innovation)	Doubt innovations; below-average social status; lower financial liquidity; limited opinion leadership
Laggards (last 16% to adopt the innovation)	Little to no opinion leadership; fear of debt; focuses more on 'traditions'; relatively low social status; low financial liquidity

Source: Shambare and Donga (2019)

Innovators: This adopter category forms the smallest segment of the market (2,5%) and consists of people who want to be the first to try out new innovation. They are mostly risk takers, adventurous, typically highly educated, and sociable. Marketers and retailers usually target these consumers first when they introduce an innovation as very little, if anything, needs to be done to appeal to this population.

Early adopters: Early adopters form a slightly larger part of the market (13,5%) and tend to be role models for others, possess good social skills, and act as opinion leaders; in other words, those individuals who are known for their expertise and who usually garner respect within the larger social system. Early adopters utilise both interpersonal sources (people they interact with such as friends and colleagues) and mass media (for example, newspapers, radio, magazines, and television) as sources of information. Marketers and retailers who are introducing an innovation need to focus on early adopters by advertising and communicating through the marketing channels that they frequently use. The adoption of an innovation by early adopters usually sets the trend for others who do not have access to the same information, or who prefer to obtain knowledge of an innovation from these early adopters rather than from advertising campaigns. Early adopters influence adoption decisions of the early majority, who constitute a sizeable portion of the market (34%).

Early majority: This category consists of consumers who wait until many of the early adopters have tried and approve an innovation, before adopting it (Du Plessis, 2010). The category consists of individuals who are quite thoughtful before adopting new products, although they generally adopt innovative products shortly before the target population as a whole. The early majority constitutes about 34% of consumers in the target market. They may have a great deal of contact with mass media, salespeople, and opinion leaders (who are found in the early adopters' group), but they are not opinion leaders themselves.

Late majority. Constitutes a third of the target market (34%). These consumers tend to be cautious when assessing innovations, taking more time than normal in adopting the innovation, and are usually subject to some pressure from peers. As a result, these consumers tend to wait until the adoption of the innovation has reached a 'critical mass', that is, the stage where the product has proven itself and is not considered new anymore, before they consider buying it. At this stage, they will be able to access a great deal of information regarding the product as well as other consumer's feedback regarding the product.

Laggards. Tend to be tradition bound and base their decisions on what happened in the past. Even though they constitute 16% of the target market, they are not a viable market for innovative products as they are inclined to be suspicious of products they are not familiar with and tend to stick with products they have used in the past, or for a long time. It is for this reason that they tend to adopt the innovation only once the rest of the target market has adopted it.

D'Este, Iammarino, Savona & von Tunzelmann (2012) states that distinguishing between innovators and non-innovators is important in the successful adoption of innovations. Relating to adoption of mobile technologies, university students typically fall well into either the innovator or early adopter categories depending on an individual's innovativeness. According to Lee (2014), the higher smartphone adoption rate among college students than among people in other age groups indicates that a large portion of the early users of mobile technologies are college students.

3.5.3. Technology Acceptance Model (TAM)

Another very prominent theory related to the adoption of new technologies is the technology acceptance model, commonly referred to simply as TAM, which was developed by Fred Davis in 1986 (Mayowa, Blessing, Mosunmola, Fred, & Motilewa, 2017). TAM is based on the theory of reasoned action (TRA) by Fishbein and Ajzen (1975). As an extension and variation of the TRA, TAM posits that individuals' beliefs and perceptions about an innovation influence their attitudes towards it, which in turn leads to behavioural intentions to adopt the innovation (Agarwal & Prasad, 1998). The model presupposes that two determinant variables associated with an innovation: perceived usefulness (PU) and perceived ease-of-use (PEU), are drivers of its adoption (Davis, 1989).

PEU explains users' perceptions of the amount of effort required to utilise the system or the extent to which a user believes that using a particular technology will be effortless and relatively easy. On the other hand, PU is the 'prospective adopter's subjective probability that applying the new technology will be beneficial to his personal and/or work life' (Tanakinjal, 2006: 35). Although both variables are important in determining adoption behaviour, more recent studies such as that by Abdullah, Ward, and Ahmed (2016) propose that PEU affects technology acceptance indirectly through PU. In other words, PU mediates the relationship between PEU and adoption (See Figure 3.4). This can be seen by the fact that regardless of how a technology might be useful and 'beneficial', if it is not easy to use, its complexity will outweigh its benefits. As such, consumers will be less likely to adopt the product.

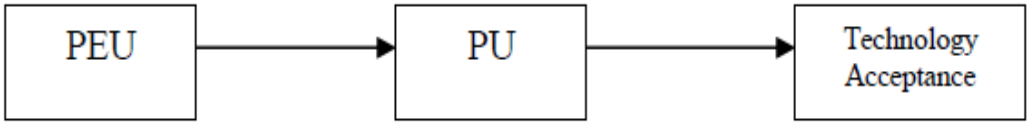


Figure 3.4: Technology Acceptance Model

Source: Adapted from Shambare (2012)

TAM has specifically proved to be a more reliable model for studying computer and other related information technologies (Tanakinjal, 2006). As a result, the model has received broad support in empirical studies of consumer decision making in ICT-related products (Walczuch, Lemmink, & Streukens, 2007). In applying the TAM, parallels are drawn between the IDT and the TAM frameworks. For instance, Taylor and Todd (1995; cited in Shambare, 2012) note similarities between relative advantage and the notion of perceived usefulness, a user's subjective assessment of the extent to which using an innovation will increase her job performance. Also, PEU is comparable to the notion of complexity, as espoused by the IDT framework (Davis, 1989). The latter also supports the assertion in the literature that three characteristics of innovations: relative advantage, complexity, and compatibility, have proved to be consistently related to adoption behaviour (Agarwal & Prasad, 1998; Arts, Frambach & Bijmolt, 2011; Berger, 2009; Meuter et al., 2005).

3.5.4. Theory of Reasoned Action

Theory of Reasoned Action (Fishbein & Ajzen, 1975) is a tool used to achieve deeper insights into how attitudes and beliefs are related with individual intentions to perform. The TRA model (See Figure 3.5) represents a comprehensive integration of attitude components into a model that is designed to lead to both better explanation and better predictions of behaviour. TRA is a refinement of Fishbein's multi-attribute model that clarifies the relationship between attitudes and behaviour. In accordance with this expanded model, to understand consumers' intention to adopt a particular innovation it is essential to measure the subjective norms that influence an individual's intention to adopt (Schiffman, Kanuk & Kumar, 2010).

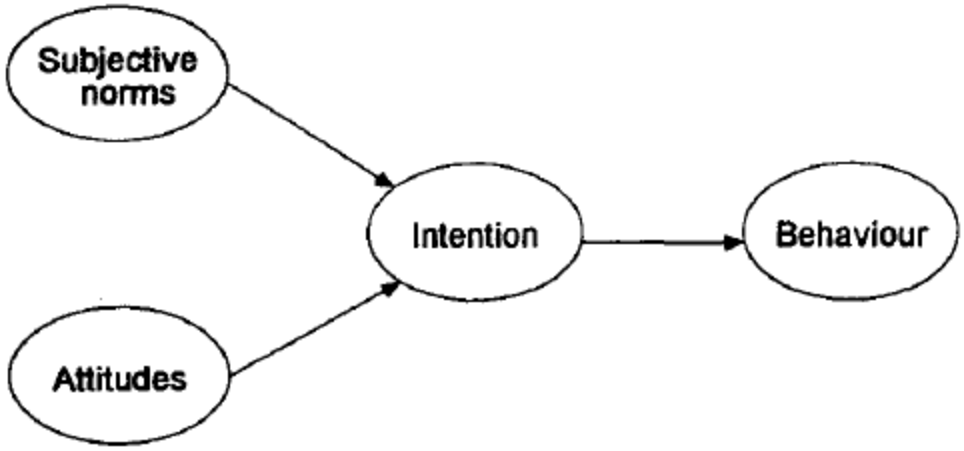


Figure 3.5: Theory of Reasoned Action

Source: Adapted from Ajzen and Fishbein (1988)

Subjective norm can be described as an individual's perception of the social pressure to perform the target behaviour (Ajzen & Fishbein, 1988). For instance, Jim's parents do not like watching TV, as they believe that it kills the brain tissues. However, in Jim's class everybody watches TV and they talk a lot about the movies and other TV shows. Here Jim's subjective norms towards TV may depend upon how he is being influenced and who makes a deeper impression in his mind. In other words, subjective norm is composed of the user's perception of how others think about the user's behaviour, and the user's motivation to comply with the expectations of these referents (Fishbein & Ajzen, 1975). The components of TRA are three general constructs: behavioural intention, attitude, and subjective norm. TRA proposes that the most significant determinant of a consumer's actual behaviour is the intention to perform a behaviour which is a function of attitude towards behaviour and subjective norms (Vatanparast, 2010).

3.5.5. Theory of Planned Behaviour

The theory of planned behaviour (See Figure 3.6) is an extension of the theory of reasoned action (Fishbein & Ajzen, 1975) and includes an additional factor leading to intention: the construct of perceived behavioural control which is a consumer's perception of whether the behaviour is or is not within the consumer's control (Ajzen, 1991). Perceived behavioural control plays an important part in the theory of planned behaviour. Perceived behavioural control denotes a subjective degree of control over the performance of a behaviour and should be read as perceived control over the performance of a behaviour (Yang & Zhou, 2011). Kiriakidis (2017) defines perceived

behavioural control as the perceived ease or difficulty of performing the behaviour. In the context of system usage, perceived behavioural control relates to the degree to which an individual believes that the consumer has control over personal or external factors that may facilitate or constrain system use (Vatanparast, 2010). For mobile services, attitude towards behaviour can then be described as an individual's favourable or unfavourable evaluation of using a specific service while subjective norm can be seen as the perceived social pressure to use or not to use the pointed service. Procter, Angus, Blaszczynski & Gainsbury (2019) show that perceived behavioural control, attitudes, and subjective norms are all positively related to the intentions about the behaviour which predicts the actual behaviour of a consumer.

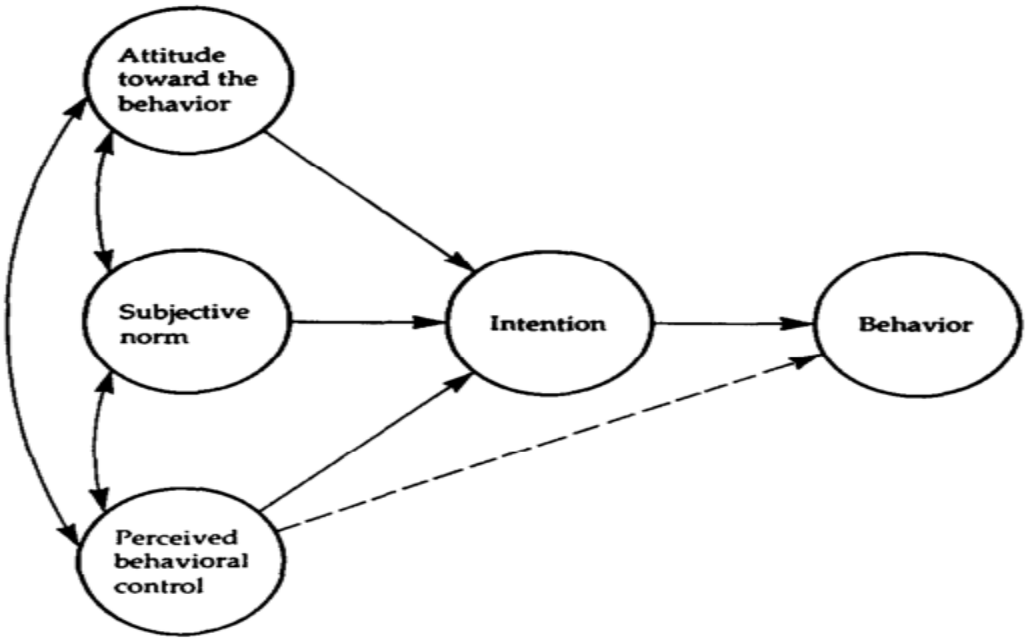


Figure 3.6: Theory of Planned Behaviour

Source: Adapted from Ajzen (1991)

According to Vatanparast (2010) the TPB model has not been tested sufficiently in empirical studies because of some limitations, such as the ambiguity that surrounds the definition of perceived behavioural control and lack of consideration of unconscious motives - as TPB is grounded on the belief that people think rationally and make logical decisions.

3.5.6. Unified Theory of Acceptance and Use of Technology

Aimed at harmonising the literature associated with acceptance of new technology, Venkatesh et al. (2003) developed a unified model that brings together alternative views on user and innovation acceptance – the unified theory of acceptance and use of technology (UTAUT). The UTAUT (See Figure 3.7) suggests that four core constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of behavioural intention and ultimately behaviour, and that these constructs are in turn moderated by gender, age, experience, and voluntariness of use (Venkatesh et al., 2003). It is argued that by examining the presence of each of these constructs in a real-world environment, researchers and practitioners will be able to assess an individual's intention to use a specific system, thus allowing for the identification of the key influences on acceptance in any given context. The four core constructs of the UTAUT as espoused by Venkatesh et al. (2003) are discussed next.

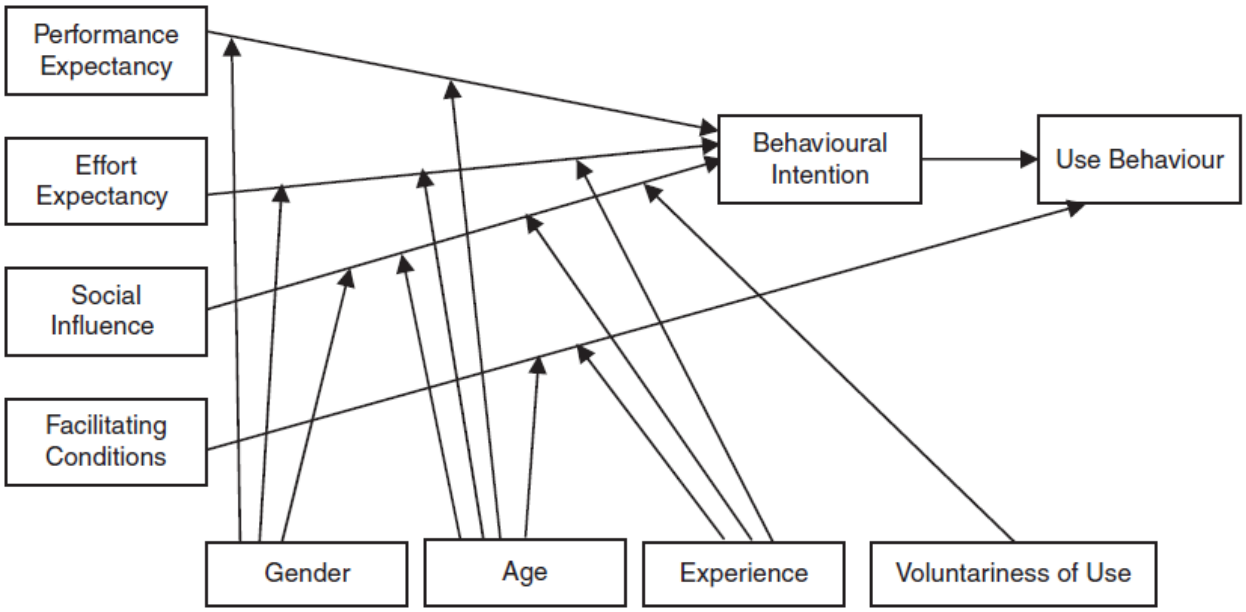


Figure 3.7: Unified Theory of Acceptance and Use of Technology

Source: Adapted from Venkatesh et al. (2003)

3.5.6.1. Performance expectancy

Performance expectancy (Venkatesh & Zhang, 2010) is defined as the degree to which an individual believes that using a technology will help him or her better attain significant rewards.

Thus, a user's expectations on the performance of a technology influences their intention to adopt the technology. Past research shows the evidence of influence by perceived performance on behavioural intention to adopt mobile marketing (Alsheikh & Bojei, 2014; Yang, Liu, Li, & Yu, 2015; Yu, 2012). Venkatesh et al. (2003) in their work provide evidence that customer's intention to adopt technology depends on how they perceive the usefulness of the technology. Similar to perceived usefulness in TAM, consumers will be less likely to adopt an innovation if it does not meet their perceived expectations.

3.5.6.2. Effort Expectancy

Effort expectancy refers to the degree of ease associated with the use of a technology (Venkatesh & Zhang, 2010). Experts in technology adoption models (Davis, 1989; Dillon, 2001; Morris & Dillon, 1997) emphasise that users' perception of ease-of-use determines the acceptance of a new technology. When a technology calls for less cognitive effort to use and apply, adopters will take it on with ease; after all, less effort is required to learn, apply, and use it. However, if a lot of effort must be devoted to learning, using or implementing such technology, the level of resistance is likely to be high; in mobile marketing, for instance, according to Lichtenstein and Williamson (2006) less effort required to execute a transaction was one of the key reasons established to influence consumers' adoption of the technology.

3.5.6.3. Social Influence

Venkatesh and Zhang (2010) define social influence as the degree to which an individual perceives that their important others believe he or she should use new technology. Social influence, for instance from friends and colleagues, highly eases intention and the process of technology adoption. Furthermore, social influence gives confidence to new users of the technology of its usefulness and value, thus new users will easily adopt it. Vannoy and Palvia (2010) present confirmatory findings in relation to intention to accept high-tech innovations as being positively affected by social influence.

3.5.6.4. Facilitating Conditions

Facilitating conditions is defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of technology (Abdulwahab &

Dahalin, 2010). In the mobile marketing context, facilitating conditions can be seen as the extent to which consumers believe that adequate technical infrastructure exists to enhance the execution of mobile marketing transactions. Facilitating conditions, for instance the introduction of fourth generation (4G) network infrastructure, have radically improved mobile commerce through greater Internet connectivity which has shortened the time needed to execute online transactions.

Although the conceptual frames discussed above contribute immensely to the study of IT adoption, they pose some limitations which need to be considered. According to Bhatiasevi (2015), even though the theories use different terminologies, they are essentially explaining related and similar concepts which pose some challenges when contrasting them. Furthermore, the author posits that all the theories assume an attitude-intention behaviour relationship, that is cognitive and normative or affective beliefs form attitude, which in turn has influence on behavioural intention and actual usage behaviour. As shown in Table 3.3, they are four major factors which can be deduced from the conceptual frames in relation to a particular technology: (1) user friendliness of the technology (2) potential benefits of the technology (3) influence of others towards use of the technology, and (4) influence of the technology on perceived self-image.

Table 3.3: Commonly Used Innovation Theories and their Distinctive Similarities

Factor	**Representation of Factors in various Conceptual Frameworks**				
	IDT	TAM	TRA	TPB	UTAUT
User friendliness of the technology	Complexity	PEU			EE
Potential benefits of the technology	RA	PU	ATT	ATT	PE
Influence of others towards use of the technology			SN	SN	SI
Influence of the technology on perceived self-image	Compatibility			PBC	

Source: Compiled for the study

When looking at the user friendliness of a technology factor, it is represented by the terms complexity, perceived ease-of-use (PEU) and effort expectancy (EE) on the IDT, TAM, and UTAUT respectively. Potential benefits of the technology are referred to as relative advantage (RA) on the IDT, perceived usefulness (PU) (TAM), attitude (ATT) on both the TRA and TPB

whilst on the UTAUT the term performance expectancy (PE) is used. The third factor, which is the influence of others towards use of the technology, is termed social norm (SN) on both the TRA and TPB, whilst the same factor is referred to as social influence (SI) on the UTAUT. The fourth and last factor, which is influence of the technology on perceived self-image, is depicted as compatibility on the IDT whilst it is termed perceived behavioural control (PBC) on the TPB.

Meuter et al. (2005) caution that owing to different terminology being used to describe related concepts, results from some studies have often been inconclusive and sometimes contradictory. For example, a study making use of the TAM and IDT (Labay & Kinnear, 1981) established substantial relationships between technology adoption and the perceived relative advantage, perceived ease-of-use and compatibility, while another study (Jo Black, Lockett, Winklhofer, & Ennew, 2001) only found relative advantage to be positively related to adoption behaviour. Nevertheless, as a remedy Pedersen (2005) recommends that when selecting an appropriate research underpinning theory, researchers need to rigorously examine whether a particular theory fits in the context in which it needs to be applied. Lichtenstein and Williamson (2006) also state that the possibility that new influences on m-Commerce adoption may be at play is very high as there is an emergence of well-informed consumers and new markets seeking deep levels of consumer engagement. Consequently, by drawing insights from the adoption theories discussed in this section, the authors suggest creating modified models or even adopting other theories that are not commonly used but respond to changing parameters in the behaviour of contemporary consumers. In the next section, the basis on which the underpinning theory of the study was selected is reviewed.

3.6. SELECTION OF THE RESEARCH'S UNDERPINNING THEORY

As discussed in the previous section, several prominent theories suggest numerous potential influences on consumer adoption of mobile marketing. However, given the factors identified in the literature, the researcher felt that the reviewed theories, though relevant, are insufficiently mature for there to exist a solid foundational basis from which to explore this study's phenomenon. Therefore, the researcher elected to draw on an alternative theory while yet heeding the theories reviewed in Section 3.5. Ultimately, the uses and gratification theory (UGT) propounded by Katz, Blumler, and Gurevitch (1973) was considered the most appropriate for the purpose of this study, due to the following reasons:

I. The emergence and widespread usage of the Internet would come with new changes in roles, personal, and social habits of media users. This diversification of the use of media is what promotes the UGT (Musa, Azmi, & Ismail, 2015). Lichtenstein and Williamson (2006) further assert that the initial personal choice of the Internet as a medium for information consumption underpins consumer adoption of mobile commerce. As the mobile Internet is a mass medium, UGT becomes useful in explaining why people choose the mobile technology for general message consumption.

II. The study is limited to university students and they are described as the major users of the Internet. Therefore, the UGT is an ideal theory to identify and analyse the factors which motivate their use of the Internet (Musa et al., 2015; Punyanunt-Carter, De La Cruz, & Wrench, 2017).

III. University students are mostly hedonists who have experiential shopping behaviour. This consumer segment not only gather information to shop online but also seeks fun, excitement, joy, festivities, escapism, fantasy, and adventure (Fiore, Jin, & Kim, 2005). Furthermore, student shoppers want to be immersed in the online shopping experience and their perceived experiences determine their continued use of mobile marketing services. Consequently, the UGT acts as a powerful theory when examining adoption of mobile technology by university students.

IV. As opined by Fang, Hu, Li, and Tsai (2013), social networks and the position of the adopter in social networks are important determinants of adoption. These mechanisms should somehow be integrated into a theory of mobile service adoption, but it is also necessary that this theory integrates mechanisms in which services are adopted for functional reasons as well. Following this notion, both functional and social motives for adoption of mobile technologies are embedded within the UGT, making it highly applicable in this study's context.

Dost, Khyzer, and Rehman (2016) allude that there is a developing need of alternative theories, models, and knowledge for virtual buying behaviour because of the evolution of mobile commerce as it is becoming a basic aspect of customer relations and marketing strategy. Thus, this study uncovers the aptness of the UGT in predicting innovative marketing adoption decisions, particularly amongst the youths. The next section reviews the UGT in detail.

3.6.1. Uses and Gratification Theory (UGT)

According to Sultan et al. (2009) the UGT (Katz et al., 1973) focuses more particularly on peoples' adoption of innovation for both utilitarian or rational motives as well as hedonic intentions for fun-seeking and enjoyment - a position which the researcher of the current study also subscribes to. In contrast to other theories linked to mobile commerce adoption, the UGT is centred explicitly on clarifying the underlining factors associated with consumers' choice of new media (Sultan et al., 2009). For instance, linked to consumers' usage of the Internet Stafford, Stafford, and Schade (2004) established that consumers' usage was delineated by process, content, as well as satisfying socialisation needs. In addition, in a research conducted specifically to the mobile setting (Nysveen et al., 2005) perceived expressiveness and perceived enjoyment were determined as directly stimulating the youth's intentions to adopt mobile data services. Consequently, the uses and gratification perspective, though largely overlooked by most studies, aids as a powerful theory in explaining the responsibility of personal motives related to areas, for instance, the mobile media, where individuals' drives for media consumption can be attributed to both utilitarian and non-utilitarian factors (Sultan et al., 2009). The emphasis of the theory (Katz et al., 1973) is on how people use media, and not necessarily the impact of media on the individual. It assumes that audience members are not passive consumers of media. Rather, the audience has power over their media consumption and assumes an active role in interpreting and integrating media into their own lives.

Unlike other theoretical perspectives, UGT holds that audiences are responsible for choosing media to meet their desires and needs to achieve gratification. Korgaonkar and Wolin (2002) identified the main individual needs for using the Internet as social escapism, information, interactive control, as well as socialisation and economic motivations. Guided by the UGT, the researcher adopted a model that fits the mobile marketing context to produce in-depth knowledge of the salient antecedents of adoption of mobile marketing transactions. The model proposes that the information seeking behaviour of university students on the Internet (utilitarian) and their need for socialisation (hedonic) catapult their intention to engage in mobile marketing services. Thus, the increasing use of the Internet by the students provides an emerging prospect for online retailers.

3.6.1.1. Information Seeking Behaviour

As indicated in the preceding section, closely linked with the UGT is information seeking behaviour. Ikoja-Odongo and Mostert (2006: 148) propose that information seeking behaviour arises as a consequence of a need perceived by the information user, who in order to satisfy it, makes demands upon formal or informal information sources or services, resulting in either success or failure. Hence, the effort to satisfy the perceived need results in information seeking behaviour. Mai (2016) broadly conceptualises information seeking behaviour as activities a person may engage in when identifying his or her own needs for information, searching for such information (accessing content) in any way, and transferring the information (sharing content).

As discussed earlier in Section 3.5.1.1 there is evidence of students possessing characteristics of being innovators or early adopters of information technologies and active Internet users who constantly look out for new information online. Students are considered information rich people who are highly skilled in identifying their information needs and apply seeking behaviours so as to access the information from online resources successfully, and satisfying their information needs (Rowlands et al., 2008). Furthermore, El-Maamirym (2017) posits that students are not following any searching model in satisfying their information needs and it is perceived that students' over confidence of their ability to use technology is the main cause of this searching behaviour. According to Kim and Lee (2008) students' information seeking behaviour has greatly extended to online purchasing, and frequent Internet browsing for product information search eventually leads to frequent online transactions.

In the mobile commerce environment, consumers looking for pre-purchase information can be engaged in two modes of information seeking activities: either browsing or directed search (Detlor, Sproule, & Gupta, 2003). Browsing pertains to instances when consumers are not sure how, or if, their purchasing requirements can be met. It is an activity in which 'one gathers information while scanning an information space without an explicit objective' (Toms, 2000: 424). In these cases, users have a less precise view of the product information that might be needed, might be available, or might be used, and thus seek out information in more of an exploratory fashion. In contrast, directed search refers to occurrences when consumers actively seek out product information with a view to make a purchase decision. Shopping in this sense is more goal-oriented or utilitarian in nature (Wolfinbarger & Gilly, 2001). Here, consumers know what they are looking for and usually possess some information about the product being sought, such as its brand or

manufacturer's name, that can be used as the basis of a specific search (Detlor, Sproule, & Gupta, 2003).

The two above mentioned information seeking processes of either browsing or direct searching by consumers have led to the formation of what Sultan, Rohm, and Gao (2009) regard as marketing-related mobile activity. Marketing-related mobile activity as suggested by the authors, relates specifically to activities conducted online that might prime consumers towards adoption of mobile marketing. A detailed discussion of these activities is provided in the next section.

3.6.2. Marketing-Related Mobile Activity

To address the paucity of academic research on consumers' adoption of mobile marketing, a study by Sultan et al. (2009) developed a conceptual model that assessed the influence of marketing-related and value-based mobile activity, including the use of mobile devices for information provision, sharing content, and accessing content on consumer acceptance of mobile marketing practice. These factors, as espoused by the authors, are drawn from the uses and gratifications perspectives that emphasize the influence of usage factors and motives on behavioural intent. Marketing-related mobile activity factors received empirical support from data collected mostly in non-African markets such as the USA, Pakistan, and China. In the current study, the researcher proposed these factors to empirically assess the adoption of mobile marketing transactions in the fast-growing and influential South African market.

3.6.2.1. Providing Information

Advances in online technology over the years have tremendously impacted the way in which marketers obtain information from consumers in order to improve targeting, segmentation, reach and, therefore, profitability (Jackson, 2019). For instance, consumers are nowadays able to post directly to businesses' websites, and most popular online sellers have online review mechanisms built in to solicit comments from customers shortly after their purchase has been received. Furthermore, online reviews have become an important information content source that allows consumers to provide information to businesses based on past consumption experiences. In the process of these online reviews businesses often request consumers to also provide information to them through surveys. These surveys afford customers a chance to voice their concerns and sing their praises of online businesses with which they have a transaction history. The marketing-

related mobile activity of providing information online has offered great relationship building tools to establish a sense of interaction between businesses and consumers (Delafrooz, Paim, Haron, Sidin, & Khatibi, 2009). A high degree of online B2C interactivity, according Wirtz et al. (2013), promotes greater adoption of m-Commerce.

3.6.2.2. Sharing Content

Ernst & Young Global Limited (2015) points out that more and more people are progressively depending on the Internet and the youth, in particular, are increasingly using social media to share information across multiple channels in an integrated fashion. This is creating a greater need for digital relevance. In recent years, online marketing has become incredibly intelligent and a stage has been reached where marketing notifications are served based on what consumers are sharing and talking about online (van Ooijen, 2019). Sharing has become something of a phenomenon and can come in all forms, whether it be a tweet, a Facebook post, or even an email telling someone to look at a link. Marketers are increasingly able to build profiles of consumers, based on their interests and what they are sharing online, and serving relevant ads accordingly. Consequently, Scott (2015) asserts that the probability of consumers adopting marketing services is very high when they share online highly targeted and relevant notifications. Hughes, Swaminathan, and Brooks (2019) further assert that consumers are increasingly relying on peer-to-peer communications; for this reason, content sharing has continued to grow in importance as an integral component of businesses' mobile marketing strategies.

3.6.2.3. Accessing Content

With the ubiquity of the Internet and mobile devices, most consumers search for products and services information online; a marketing-related mobile activity which Sultan et al. (2009) refer to as 'accessing content'. According to Chinomona and Sandada (2013), the need to access content might prime consumers towards mobile marketing adoption and businesses need to understand consumers' motivations for searching particular content online in order to create campaigns that promote brands and encourage them to purchase their products. Moe (2003) posits that consumers' satisfaction with the content they access online influences their attitude of purchase on the web site. Furthermore, Joel (2017) emphasizes that more consumers than ever are set to validate their purchase decisions by using content acquired online; for instance, real-time feedback from other consumers as well as consistent and updated business information such as

products offered, services offered, payment methods, and business specialties. If too little content is provided, consumers may end up not having sufficient information to make purchasing decisions (Branco, Sun, & Villas-Boas, 2015).

While marketing related mobile activity through modern day Internet technology affords marketers with the opportunity to track and easily connect with consumers, several concerns arise (Jackson, 2019):

- Are marketers using this technology to invade the privacy of consumers?
- Are marketers making ethical decisions in their use of consumer information?
- Do consumers know what information is being collected from them?

In an attempt to address these concerns, this study proposes adding information security as a moderator between marketing-related mobile activity and consumer adoption of mobile marketing transactions. Currently, it appears that no study has discussed the function of perceived information security as a moderator in the relationship between marketing-related mobile activity and adoption of mobile marketing transactions, specifically within the African context.

3.7. ROLE OF MODERATING VARIABLES IN EXPLAINING THE RELATIONSHIP BETWEEN INDEPENDENT VARIABLES AND ADOPTION

To lessen misinterpretation as well as to provide a better explanation of dependent and independent variables, a set of moderating variables was incorporated into the conceptual framework (Hayes, 2012; Sheikh, Shahzad, & Ishaq, 2017; Sun & Zhang, 2006). Moderating effect or interaction occurs when the effect of the predictor or independent variable (X) on the dependent or criterion (Y) variable is affected by the presence of the moderator variable (Z) (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986). Prior studies imply great potential regarding the addition of moderating factors to enhance a model's explanatory power. Specifically, Sun and Zhang (2006) advise that the consideration of moderating factors may also contribute to overcoming the inconsistencies of findings from previous studies and, as such, the technique is increasingly being applied in social science research.

Research conducted by Venkatesh et al. (2003) where they compared the explanatory power between models with and without moderators established that the explanatory power (predictive

validity) of the models increase with the inclusion of moderators. For instance, when they included to TAM2 experience and voluntariness as moderating variables, the explanatory power increased to 53% from about 35% without moderators. Similarly, when gender was included as a moderating variable, the authors established that explanatory power of TAM increased to 52% compared to approximately 35% without moderators. Thus, the inclusion of moderators leads to enhancing a model's explanatory power, making investigating moderating effects worthwhile. Consistent with the advice of the above-mentioned experts, this author conceded to the notion of moderation analysis. In the proposed conceptual model, information security is included as the primary moderating variable between marketing-related mobile activity and mobile marketing transactions adoption.

3.7.1. Moderating Role of Information Security

The present researcher argues that a more complete understanding of the relationship between marketing-related mobile activity and adoption of mobile marketing transactions can be achieved when it is complemented with an alternative perspective: that most mobile commerce transactions have recently been overshadowed by information security panics. This aptly places information security as moderator between the two variables. Thus, a postulation is made that the greater the consumers' perception that the website of an online merchant guarantees information security such as verification, authentication, and protection, the more likely they are to partake in marketing related mobile activity. Ultimately, this positive interaction between perceived information security and marketing-related mobile activity is further proposed to result in favourable consumer behaviour towards adoption of mobile marketing transactions.

Despite a surge in the studies concerning security in m-Commerce, there is currently lack of research investigating information security as a moderator variable which influence adoption of innovative mobile marketing. More so, empirical support for the study's postulation that information security moderates the relationship between marketing-related mobile activity and adoption of mobile marketing transactions is surprisingly rare. Hence the principal contribution of this study is in furthering understanding of this concept, since this is one of the first studies that have investigated the phenomenon. Figure 3.8, therefore, presents the proposed conceptual frame and describes the relationship of the variables.

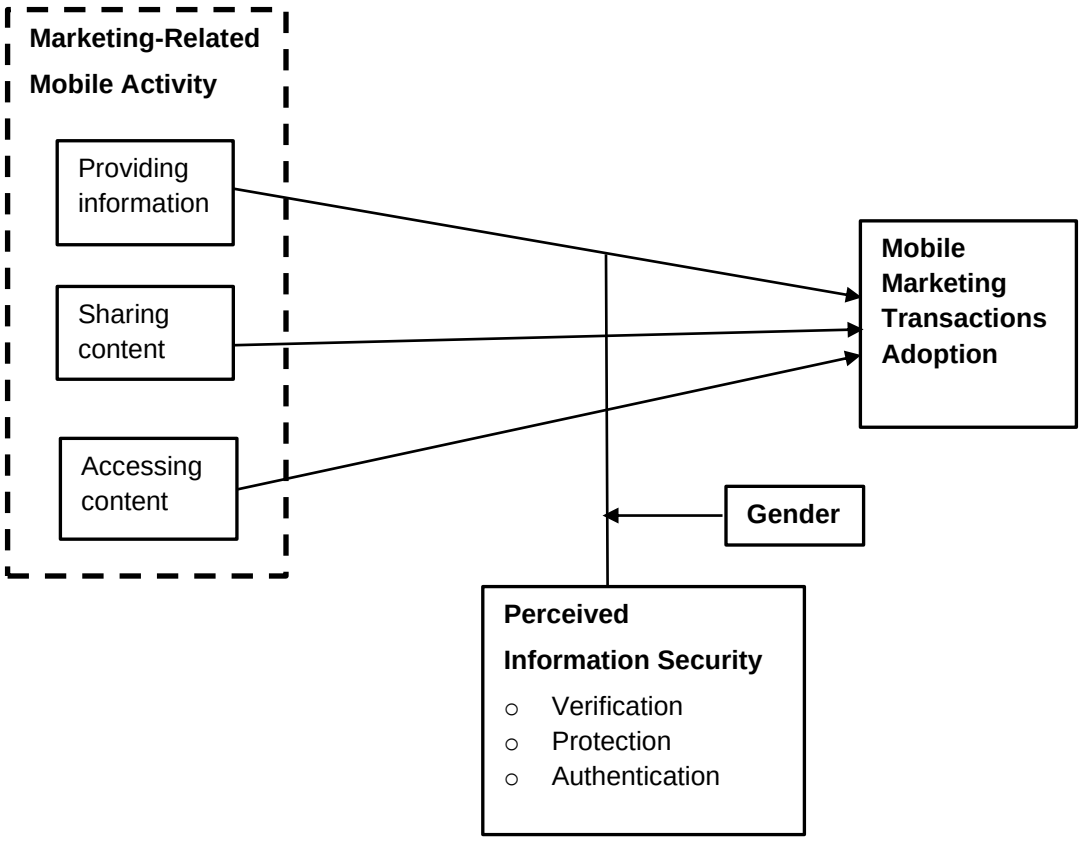


Figure 3.8: Proposed Moderated Moderation Conceptual Model

Source: Developed for the study

As depicted in Figure 3.8, there is the presence of a secondary moderator variable (gender) which is assumed to affect the moderating role of perceived information security. The proposition advanced by the researcher is that the moderation of perceived information security on the relationship between marketing-related mobile activity adoption varies with gender. In the next section, a detailed review of the gender effect in shaping security perceptions is outlined.

3.7.2. The Role of Gender in Shaping Security Perceptions

Sultan and Uddin (2011) postulate that demographic factors play a significant role in shaping how consumers transact online. Furthermore, Nagra and Gopal (2013) also specifically establish gender to be one of the demographic factors that influence consumers' online behaviour when making purchases. According to the study, females are more attracted towards the various promotions presented by online retailers and they exhibit impulsiveness when executing online transactions as compared to males. In contrast Bhatnagar, Misra, and Rao (2000) argue that gender is not a major factor which influences online purchasing behaviour as it is not relevant in

predicting store preference and how much to spend, despite men and women tending to purchase different kinds of products or services via the Internet. Correspondingly, the authors established that the intention to transact online between males and females did not vary, but differences do exist in the product categories that are bought online.

Kahttab, Al-Manasra, Zaid, and Qutaishat (2012: 86) state that 'the presence of gender differences among individuals who participate in online transactions complicates the impact of consumer behaviour on m-Commerce adoption'. Therefore, when analysing the impact of online security on the adoption of m-Commerce, gender differences should be considered. According to Awad and Ragowsky (2008), females and males value different capabilities in m-Commerce, with women focusing more on trust-worthiness and assurance and the ability to share opinions and ideas and men focusing more on value gained through the purchase. Ciganek and Jarapatruin (2004) further suggest that gender differences play a significant role in the cognitive processes of individuals, which in turn influence their security perceptions towards online transactions. The authors also found that guarantee policy and assurance of security is among the major antecedents of online purchasing for females; while for males, trends in the positive/negative reviews of experts are important.

Specific to information security, Hajli and Lin (2016) suggest that women are expected to have more concerns about their privacy and security issues than men. They are more sensitive to potential information invasion when they share information online. As such, perceived privacy risk will influence users' attitudes toward information sharing more strongly for women than for men (Lin, Li, Califf, & Featherman, 2013). Furthermore, due to their nature of less risk-taking, women will love to have high control of information. As such, perceived control of information will be more important in the formation of attitudes towards information sharing for women than for men (Hajli & Lin, 2016). Griffin and Viehland (2011), however, found conflicting results which stated that there was no significant difference in the perceived information security risks related with online shopping between males and females. Similarly, the analysis reported by Geniş Gruber, Gönül and Taş (2012) based on a survey conducted among 184 university students did not reveal any strong impact of gender on the adoption of online shopping technology. The authors attributed this finding to the homogeneity of the population' characteristics and its strong affinity with Internet and online technologies.

These inconsistences within the previous results pertaining to gender effects on m-Commerce adoption triggered the present study to explore the issue more. In addition, globally, little research has been conducted to effectively gauge the impact of gender differences on the adoption of mobile-based technologies in general, and m-Commerce in particular (Faqih & Jaradat, 2015). Given the paucity of research in this field of study as well as the inconsistency of previous findings, it strongly reinforces the need for further research to improve the understanding of the impact of gender on the adoption of m-Commerce, specifically in a developing country context.

3.8. CHAPTER SUMMARY

In this chapter, a review of consumer choice behaviour and decision-making process in the context of m-Commerce is outlined. The theories relating to the selection and adoption patterns of marketing innovations were also discussed. Finally, the proposed conceptual frame was also presented, accompanied by a discussion of the research variables. The methodological approaches applied to address the research objectives and to test the hypotheses will be explored in Chapter 4.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1. CHAPTER OVERVIEW

In the previous chapter, the literature related to this research was reviewed. This chapter describes the methodology used to collect the primary data which was used to answer the research questions and to test the proposed model and hypotheses. The chapter begins with a justification of the selected paradigm and methodology as they relate to the stated research problem. Thereafter, sampling techniques and units of analysis will be discussed. Some ethical issues concerning this research will also be discussed in this chapter. Finally, the chapter concludes by highlighting the limitations of the scope of the selected methodology and paradigm.

4.2. INTRODUCTION

Examination of the existing literature in the previous chapters culminated in the research problem, following which a conceptual frame was developed. The literature review revealed a gap in the body of knowledge on the adoption of marketing innovations in developing nations, in particular South Africa. The purpose of this chapter is to describe the methodology used to resolve the research problem. The methodology applied in this study is a descriptive single cross-sectional design (Malholtra, 2010). Data were collected from respondents once, using a self-administered structured questionnaire. In line with the collected quantitative data, statistical analysis was utilised to analyse the data.

4.3. RESEARCH PARADIGM

Creswell (2003) states that in order to formulate a suitable research strategy that explains how data will be collected and analysed and knowledge gained, a clear research paradigm should first be established. This is primarily because any philosophical assumptions regarding the topic of interest impact upon how the phenomena can be understood, and therefore such assumptions must remain constant throughout the research exercise (Creswell, 2003). Morgan (2007) describes a paradigm as a bent of theories and related assumptions shared amongst an association of researchers. According to Blumberg et al. (2011), the two most renowned research

paradigms are positivism and interpretivism. Furthermore, the dispute on the variances between these two paradigms, which is referred to as the 'paradigm war' by Tashakkori and Teddlie (1998) is usually associated with the choice of the design for a specific study. For instance, Tobbin (2013:73) states that a quantitative approach 'implies the holding of positivist paradigm beliefs, whereas a qualitative approach implies the holding of beliefs associated with a constructivist paradigm position'. Jackson and Carter (1991) point out that the philosophical variances concerning these two paradigms are incommensurable – both epistemologically and ontologically (See Table 4.1).

Table 4.1: Ontology and Epistemological Differences of Positivism and Interpretivism

Ontology	**Positivist**	**Interpretivist**
Nature of 'being'/ nature of the world	Have direct access to real world	No direct access to real world
Reality	Single external reality	No single external reality
Epistemology		
'Grounds' of knowledge/ relationship between reality and research	Possible to obtain hard, secure objective knowledge	Understood through 'perceived' knowledge
	Research focus on generalization and abstraction	Research focuses on the specific and concrete
	Thought governed by hypotheses and stated theories	Seeking to understand specific context
Methodology		
Focus of research	Concentrates on description and explanation	Concentrates on understanding and interpretation
Role of the researcher	Detached, external observer	Researchers want to experience what they are studying
	Clear distinction between reason and feeling	Allow feeling and reason to govern actions
	Strive to use rational approach	Use of pre-understanding is important
	Seek to maintain clear distinction between facts and value judgments	Distinction between facts and value judgments less clear
	Aim to discover external reality rather than creating the object of study	Partially create what is studied, the meaning of phenomena
Techniques used	statistical and mathematical methods	Primarily non-quantitative

Source: Carson, Gilmore, Perry, and Gronhaug (2001)

- ***Ontology*:** Ontology (Thobin, 2013) defines our interpretation (be it assumptions or claims) on the nature of reality, and particularly is this an objective reality (objectivism) that subsists, or only a subjective reality (subjectivism), generated in our minds. The realist (positivists) ontology (Guba & Lincoln, 1994) holds that there is a single existing reality and that it is the responsibility of the researcher to uncover that reality. On the other hand, the ontological position to scientific inquiry of the interpretivism paradigm underscores that individuals build their reality through familiarity, social, and mental construction. This is also regarded to as relativist ontology (Thobin, 2013).

- ***Epistemology*:** Epistemology deals with 'the nature of knowledge' - its probability, scope, and general biases (Gioia & Pitre, 1990). It represents a certain appreciation of what is involved in knowing, that is, how we actually know what we know. Emerging from the natural sciences, the positivist rational of epistemology is reflected by hypotheses testing established from prevailing theories through the measurement of social reality. Thus, the positivist undertakes a scientific method to knowledge development, and claim that only knowledge which is scientific is effective, certain, and precise. On the other hand, the fundamental assumptions guiding the interpretivist rational (Thobin, 2013: 75) is that people who are active in the research process 'socially construct knowledge' and that researchers 'should attempt to understand the complex world of lived experience from the point of view of those who live it'. This paradigm discards the positivist thinking that a similar method to the one used for studying natural science can be effectively used to study human behaviour (Willis & Jost, 2007).

In light of the above, the critical concern is that the undertaken paradigm for this study should be both applicable to the research objectives, as set out in Section 1.4, and rigorous in its operationalisation. Overall, in order to realise the research objectives, a positivist philosophy is required for this purpose, that is, the understanding of how information security influences consumer behaviour towards the adoption of mobile marketing transactions.

4.3.1. Justification of the Paradigm

Due to the nature of the study at hand, the interpretivism paradigm is considered unsuitable for this research for the following reasons: 1) firstly, interpretivism is more suitable for theory-formulation studies, commonly in grounded theory or case studies (Guba & Lincoln, 2005); this

current research does not concern itself with building but confirming prevailing theories, 2) secondly, because researchers in constructivist paradigms are 'participants' (Healy & Perry, 2000:119), findings often are 'co-constructed' by their interaction in the research; in the present study, the researcher is neither a participant nor interested in building theories, therefore, interpretivism is not an appropriate philosophy.

As a result, for this study the positivist paradigm is considered preferable because in relation to the research objectives, the positivism paradigm seems more suitable for solving the 'what' and 'how' questions relating to the adoption of mobile marketing transactions. In addition, as followed by this study, in positivism a researcher commences with a theory from previous findings or individual observations, generates some hypotheses to be verified, and gathers data that either accepts or rejects the hypotheses (Mohan, 2014). Furthermore, data collection within the pure positivist paradigm follows the quantitative method (See Table 4.1) containing the representation of holistic phenomena in variables which are measurable.

4.4. RESEARCH TECHNIQUE

In order to ascertain the suitable technique for this study, consideration was given to the type of data collection and specific kind of research that the researcher wished to conduct. In doing so, it became important for the researcher to first determine the appropriate research approach to follow. According to Saunders et al. (2009), there are two main types of research approach that can be employed - the inductive and deductive approaches. The first approach (deductive approach) is also known as the theory testing approach; with this approach the researcher develops a theory or hypotheses and designs a research strategy to test the formulated theory. The second approach (inductive approach) is also known as a building theory; the researcher starts with collecting data in an attempt to develop a theory. As a result, a researcher should explain clearly which approach is being followed in his or her research project.

For this research, the deductive approach was used in understanding the consumer behaviour of respondents as it provides a basis for scientific-style model specification and testing, with very accurate results (Mohan, 2014). Deduction possesses several important characteristics. First, there is the search to explain causal relationships between variables, and then it is operationalised in a way that enables facts to be measured quantitatively. This holds that problems as a whole are better understood if they are reduced to the simplest possible elements. The final

characteristic of deduction is generalisation. In order to be able to generalise statistically about regularities in human social behaviour, it is necessary to select samples of sufficient numerical size (Saunders et al., 2009). As a consequence, the use of the quantitative technique was applied as the primary method for the data gathering process.

According to Creswell (2013), quantitative research is a technique for the testing of objective theories through the examination of the relationship between variables. These can be measured typically through the use of instruments, so that numbered data can be analysed using statistical procedures (Moutinho & Hutcheson 2011). Consistent with this view, this study was intended to test relationships existing between variables which are proposed in the research model (See Chapter 3). The quantitative approach offers high reliability and generalisability, strength in the testing of theory, reduced vulnerability to researcher bias, and is fast and economical (Sedmak & Longhurst, 2010), which makes it a more attractive research technique for the study at hand.

4.5. RESEARCH DESIGN

A research is designed in line with the nature of the problem identified and the questions to be addressed (McGivern, 2006). The stated objectives of this research are confirmatory in nature, as they sought to describe and confirm the consumer behavioural patterns towards innovative marketing within the student market in South Africa, and to establish as well as explain the nature of the effect of information security on consumers' mobile-marketing transactions behaviour.

Research design provides the overall direction for the collection and analysis of the data of a study (Mohan, 2014). The importance of research design stems from its role as a critical link between the theory and argument that informed the research and the empirical data collected (Nachmias & Nachmias, 2008). The choice of research design reflects decisions about the priority being given to a range of dimensions of the research process (Bryman & Bell 2007), and this of course will have considerable influence on subsequent methodological procedures such as sampling and statistical packages. Along with a clear research plan, research design provides constraints and ethical issues that a study will inevitably encounter (Saunders et al., 2009).

As such, this study employed the descriptive single cross-sectional design (Lindell & Whitney, 2001) in which only a single sample of respondents is extracted from the population of interest, and data is gathered from this sample through a one-off survey. The single cross-sectional design

is embedded within the conclusive research approach (See Figure 4.1) which is descriptive in nature. The conclusive approach is used when testing specific hypotheses as well as examining relationships where the analysis of primary data is quantitative (Shukla, 2008).

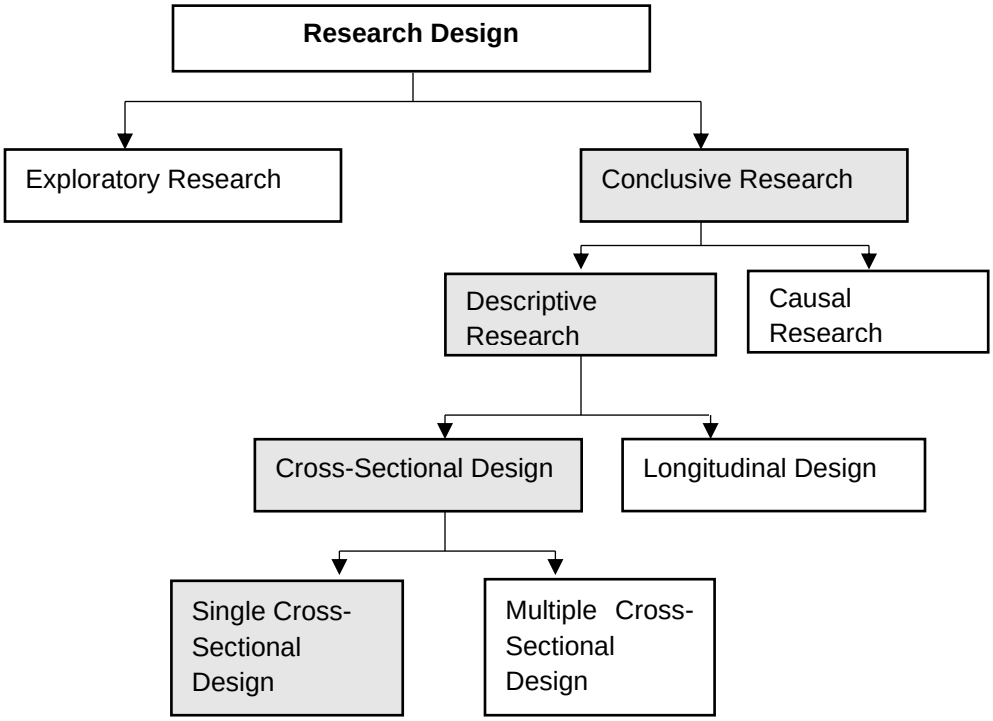


Figure 4.1: Categorisation of Research Designs

Source: Adapted from Shukla (2008)

The key purpose of descriptive research (Kotler & Armstrong, 2012; Malhotra, 2010) is to recount a phenomenon, for instance, a market characteristic. Descriptive research has some diverse uses, such as narrating the features of particular groups, anticipating consumer behaviour, and establishing attitudes as well as perceptions (Malhotra, 2010). Descriptive research is also employed in order to establish the degree to which marketing variables are related. Furthermore, Churchill (1995) depicts descriptive research to be more than merely collecting an extensive amount of facts. According to the author, research relies largely upon a single or several hypotheses formulated, and it is on these hypotheses that the study is based. In light of the above, it becomes imperative for this present study to follow the descriptive single cross-sectional design.

4.6. RESEARCH STRATEGY

Saunders et al. (2009: 600) defines research strategy as 'the general plan of how the researcher will go about answering the research questions'. On a similar note, Bryman (2008: 698) identifies research strategy as 'a general orientation to the conduct of research'. Research strategy, according to Remenyi et al. (2003), provides the overall direction of the research including the process by which the research is conducted. Saunders et al. (2009) mentions that an appropriate research strategy has to be selected based on research questions and objectives, the extent of existing knowledge on the subject area to be researched, the amount of time and resources available, and the philosophical underpinnings of the researcher.

Adapting a quite different approach, Yin (2003) recommends that a particular research strategy has to be selected based on three conditions: the type of research question, the extent of control an investigator has over actual behavioural events, and the degree of focus on contemporary or historical events. There are various different research strategies with distinctive characteristics available from which a researcher may select, based on the above criteria. Both Yin (2003) and Saunders et al. (2009) acknowledge that although various research strategies exist, there are large overlaps among them and, hence, the important consideration would be to select the most advantageous strategy for a particular research study. Some of the common research strategies used in business and management are experiment, survey, case study, action research, grounded theory, ethnography, and archival research (Saunders et al., 2009). From these various strategies, this research sought to adopt the survey research strategy. The following section describes the survey strategy and justifies its preference for this study.

4.6.1. Survey Research Method

A survey is a systematic method of gathering data from a population, by sampling a portion of that population and subsequently generalising the attributes of the population from this sample. Baker and Foy (2003) state that a survey is concerned with fact finding by asking questions of persons representative of a population of interest to determine attitudes and opinions, and help understand behaviour. This study concerns itself with describing or explaining consumer behaviour in South Africa. It takes a sample of the consumers from the university student market; therefore, it made sense to conduct a survey. The survey strategy is usually associated with the deductive approach. It is a popular and common strategy in business and management research

and is most frequently used to answer questions about who, what, where, how much, and how many (Mohan, 2014). It, therefore, tends to be mostly used for descriptive research. Surveys are popular as they allow the collection of a large amount of data from a sizeable population in a highly economical way.

Often obtained by using a questionnaire administered to a sample, these data are standardised, allowing for easy comparison. In addition, Baker and Foy (2003) state that the survey technique is popular within the quantitative research approach because of its advantages in providing a basis for gathering factual data, as well as its ability to provide the researcher with great scope in terms of reach, sample size, and costs. In marketing research, surveys are used to gather data on various topics and are particularly useful for researching attitudes, lifestyle, behaviours, decision making, and demographics (Mohan, 2014). The survey method became particularly useful in this study for a number of reasons. Firstly, it ensured quality in validity and reliability, as this was the methodology applied in past research (Healy & Perry, 2000; Hubbard & Armstrong, 1994; McKinnon, 1988). Secondly, a relatively large sample across an expanded geographic coverage could easily be accessed, which also enhanced representativeness (Blumberg et al., 2011). Thirdly, tried and tested scales could be used to collect data rapidly using a minimal research team, which is usually in line with budget constraints imposed on doctoral theses as this one (Perry, 1998). Fourth, the research objectives including hypotheses necessitated the collection and analysis of quantitative data (Field, 2009).

This empirical precedence as well as other considerations such as costs, time, and accessibility, were major considerations in the valuation of the survey method's suitability for this research which focuses on aspects of consumer behaviour involving attitudes, perceptions, and motivation on the adoption of mobile marketing transactions within the South African tertiary students market.

4.7. SAMPLING DESIGN AND TECHNIQUES

In order to secure a suitable sample for the study, several aspects were taken into consideration. For an effective sampling design, the current research combined sampling design criteria recommended by Blumberg et al. (2008). The resultant seven-step sampling design constitutes the following: (1) population of interest, (2) parameters of interest, (3) sampling frame, (4) sampling technique, (5) minimum sample size required, (6) cost and budget of obtaining such a sample, and (7) execution of research design. Although these criteria are sequential in nature,

Blumberg et al. (2008) caution that specific aspects of one criterion almost always result in revision of earlier criteria. Each of these seven criteria is reviewed next.

4.7.1. Population of Interest

Since the study was concerned with consumer behaviour among university students, all registered students with mobile devices from South African universities constituted the population of the study. However, the target population was more appropriately defined 'in terms of elements, sampling units, extent, and time' (Malholtra, 2010:372). Table 4.2 summarises the population definition.

Table 4.2: Population Definition

Population criterion	Explanation
Element	The elements from which the information is sought. These were registered university students in South Africa.
Sampling unit	In order to minimise costs associated with data collection, the sampling unit was defined as university students from three selected universities – Nelson Mandela Metropolitan University, University of Limpopo, and Vaal University of Technology.
Extent	Given the high concentration of student populations, the extent of the research was student accommodation villages at NMMU (Port Elizabeth), UL (Turfloop) and VUT (Vanderbijlpark).
Time	The time of the sample survey was from July to November 2018.

Source: Adapted from Malholtra (2010)

4.7.1.1. Rational for Studying the Student Market

Giving through consideration of the need to exercise some caution when employing a student sample (Ashraf & Merunka, 2017; Hanel & Vione, 2016; Henry, 2008), this section presents motivation for their use in this study to mitigate biases which might influence the results. By selecting the tertiary student market, this study is motivated by the notion of Shankar and Balasubramanian (2009) that mobile marketing appears to work better for some customer segments than for others. The authors reveal that respondents to mobile marketing offers were

most likely to be heavy users of mobile phones and data features. Cheon, Lee, Crook, and Song (2012) further proffer that these users are mostly young adults especially the tertiary students who are innovators and are more likely to adopt products independently. The authors suggest that students are more affluent and are likely to understand technology as they are more educated than other consumers.

Today's consumers, especially the tertiary students (Shava, Chinyamurindi, & Somdyala, 2016), are much more used to having technology incorporated into most aspects of their work and personal lives. Furthermore, rather than selecting the entire general market, this study argues that to spur the rate of mobile marketing adoption in South Africa which is still low, marketers need to focus more of their attention on innovators and early adopters. Blackwell, Miniard, and Engel (2006) propound that if marketers fail in winning adoption of innovation by innovators and early adopters, there is not much hope for the rest of the target market. Thus, the tertiary student market can be viewed as opinion leaders who possess strong capabilities of influencing innovation adoption to other adopter categories (early majority, late majority, and laggards). Following also notions from proponents such as Calder et al. (1981) and Lucas (2003); as cited in Ashraf and Merunka (2017) this study argue that because the aim is to test a model dealing with fundamental human behaviour, students as humans do represent a legitimate sample choice.

An important innovation adoption consideration which was made by the researcher when selecting the student sample was the issue of homophilly. When consumers in the market are similar in terms of education, values, needs, income and other dimensions, adoption tends to be quicker (Hoyer, Macinnis & Pieters, 2016), simply because people have similar interests and behaviour, and understand one another. In addition, similar people are likely to interact with one another and transmit information. This is called homophilly, and the target market is referred to as homophilious. In contrast, in a heterophilious consumer segment on the other hand, where individuals are dissimilar, innovation adoption will understandably be slower because consumers may have little common ground. Consistent with the above notion Calder, Phillips, and Tybout (1981; cited in Shambare 2012: 124) advance the use of a homophilious/homogeneous sample when assessing consumer behaviour:

> *'Homogeneous respondents permit more exact theoretical predictions than may be possible with a heterogeneous group. For instance, by employing a homogeneous student sample it might be possible to predict that purchases of a particular product known to be*

used by students would decrease with advertising exposure. In contrast, if a more heterogeneous sample were selected it might be possible only to predict a decline in some broad category of products. The greater variability in behaviour associated with a heterogeneous group makes precise predictions more difficult. This makes failure of the theory harder to detect. Thus, heterogeneous respondents may weaken the theory test. Homogeneous respondents also are preferred because they decrease the chance of making a false conclusion about whether there is covariation between the variables under study. When respondents are heterogeneous with respect to characteristics that affect their responses, the error variance is increased and the sensitivity of statistical tests in identifying the significant relationships declines. Thus, heterogeneous respondents constitute a threat to statistical conclusion validity' (Calder et al., 1981:200).

Following on from the population is the sampling frame, which lists all elements from which the respondents are actually drawn. The sampling frame criterion as it relates to this study is discussed in Section 4.7.3.

4.7.2. Parameters of Interest

In designing the research methodology, the nature of parameters or variables of interest is of paramount importance for at least three reasons (Cohen, Manion & Morrison, 2002). Firstly, they inform the researcher on the type of data that needs to be collected. Secondly, the type and size of the sample can be determined, and thirdly, the type of data dictates the analysis to be conducted.

As shown in Chapter 1, the objectives of the study are to develop and test a model of underlying factors influencing adoption of mobile marketing transactions among selected South African university students, with emphasis on the role of information security as a moderating variable. The proposed conceptual model highlights three main parameters in innovative marketing choice. These are: marketing related mobile activity, perceived information security, and adoption of mobile marketing transactions. The first three variables are continuous variables and were measured using a 5-point Likert scale anchored at 1 = Strongly Disagree and 5 = Strongly Agree (See Table 4.3).

Table 4.3: Parameters of Interest

Variable	Type of Variable	Measurement	No. of items
Providing information	Mediating	Continuous	4
Sharing content	Mediating	Continuous	4
Accessing content	Mediating	Continuous	4
Protection	Moderating	Continuous	4
Authentication	Moderating	Continuous	4
Verification	Moderating	Continuous	4
Adoption	Independent	Continuous	3
	Total continuous variables		**27**

4.7.3. Selection of Survey Nation and Sampling Frame

South Africa was considered a useful survey nation for this study for two main reasons. Firstly, mobile penetration in SA has reached staggering levels and for most South Africans, mobile is the only way for people to access the Internet where by end of 2016 a remarkable 80% of Internet users used only their mobile devices to go online (Samakosky, 2016). To substantiate this, Mobile research group GSMA Intelligence released its Mobile Economy report for 2017 showing that South Africa is the second biggest mobile market in Africa after Nigeria – but has a far higher mobile penetration rate than the west-African nation (BusinessTech, 2017). Secondly, following the growth in mobile penetration, South African big brands as well as independent stores are rigorously tapping into the mobile platform to market their products and services. The question, however, is how do South African consumers use m-Commerce? Thus, while the South African consumers are being exposed to m-Commerce services (such as mobile marketing), marketers still face challenges in getting customers to try out these innovative services. Resultantly, it makes the nation a good ground to investigate the phenomenon for the study.

The researcher's ability to select individuals from the population of interest for inclusion in the final sampling frame was constrained by the unavailability of individual contact information as it was difficult to obtain such information from the respective institutions. However, in an attempt to avert potential biases that may result from variation in contact availability, sample size, and participation rates the sampling procedures outlined in the following section were employed.

4.7.4. Sampling Technique

In order to get results which are representative of a population, it is recommended that probability sampling procedures be followed while conducting quantitative surveys. As such, sampling

literature (Coresh, Astor, Greene, Eknoyan, & Levey, 2003; Gordon-Larsen, Nelson & Popkin, 2004) recommends the use of cluster sampling for a large population such as a national survey. Cluster sampling is a probability sampling procedure in which the elements of the population are randomly selected in naturally occurring groupings known as clusters (Bryman, 2008). Cluster sampling inevitably leads to a multi-stage sampling process because the initial selection is of clusters and the subsequent selection is of either further clusters or of population units. Thus, the researcher used the multi-stage cluster sampling technique (Bryman & Bell, 2007), whereby the population of South African tertiary students was grouped into distinctive clusters.

The multi-stage cluster sampling was chosen because it is ideal when dealing with a widely dispersed population as well as when a complete list of all members of the population does not exist and is inappropriate. South Africa's 26 public universities (Universities SA, 2017) are distributed across nine provinces. Thus, it rendered it impossible for this study to focus on all the universities due to time and budget constraints; hence the study had to employ the multi-stage cluster sampling technique. The three-staged cluster approach as used by Haber and Reichel (2005) on a study of 100 largest United Kingdom companies was adopted for this study. The authors used the following three stages: (1) grouping companies into distinctive clusters, (2) sampling one company from each cluster, and (3) drawing up a sample size from each of the clusters. The procedure in which the multi-stage cluster sampling technique was conducted in this study is thoroughly discussed next.

4.7.4.1. Multi-Stage Cluster Sampling Process

In ensuring that the sampling process aligns with the multi-stage cluster sampling technique, the researcher used the procedure outlined below.

University institutions in South Africa fall under three official categories (See Figure 4.2): (1) traditional universities, which provide theoretically-oriented university degrees, (2) technology universities, which are concerned with vocational oriented diplomas as well degrees, and (3) comprehensive universities, which provide a mixture of both kinds of qualifications (Universities SA, 2017).

TRADITIONAL UNIVERSITIES	UNIVERSITIES OF TECHNOLOGY	COMPREHENSIVE UNIVERSITIES
1. University of Cape Town 2. University of Fort Hare 3. University of the Free State 4. University of KwaZulu-Natal 5. University of Limpopo 6. North-West University 7. University of Pretoria 8. Rhodes University 9. Sefako Makgatho University 10. University of Stellenbosch 11. University of the Western Cape 12. University of the Witwatersrand	1. Cape Peninsula University of Technology 2. Central University of Technology 3. Durban University of Technology 4. Mangosuthu University of Technology 5. University of Mpumalanga 6. Sol Plaatje University 7. Tshwane University of Technology 8. Vaal University of Technology	1. University of Johannesburg 2. Nelson Mandela University 3. University of South Africa 4. University of Venda 5. Walter Sisulu University 6. University of Zululand

Figure 4.2: Distinctive Categories of South African Universities

Source: Universities SA (2017) and Uni24 (2020)

In the study, each category was used as a cluster and from each cluster, following the age-order procedure (Kumar, 2013), one university was selected. The age-order procedure is a variant which helps in the selection of a respondent from several respondents (Kumar, 2013). In this study the investigator asked the question: “How many universities fall in each category?” The researcher then listed universities present in ascending order of age (years of existence), generated a random number from 1 to the total in each category, and then selected the university to which the number corresponded. Random numbers (Suresh, 2011) are generated using a calculator, a computer program, or a random number table.

Three universities were randomly selected (See Figure 4.3) by means of the Random Number Generator software (Sunar, Martin, & Stinson, 2007) and eventually a sample was created from each of the three clusters.

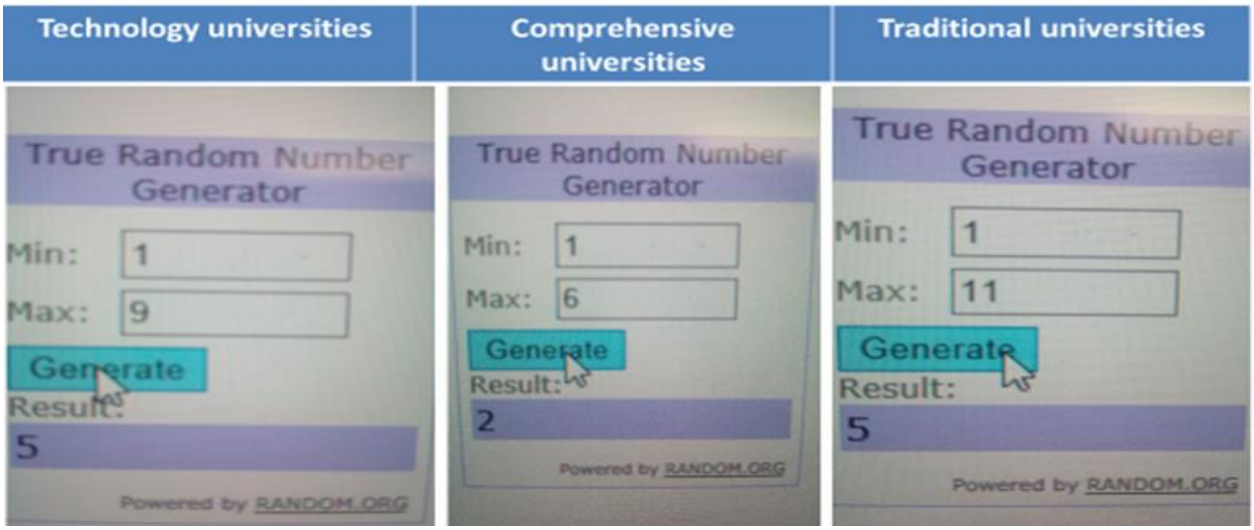


Figure 4.3: True Random Number Generator Output

The traditional universities cluster was made up of respondents from the University of Limpopo (UL), while the technology university cluster comprised of respondents from Vaal University of Technology (VUT) and lastly the comprehensive universities cluster constituted of respondents from Nelson Mandela Metropolitan University (NMMU).

4.7.5. Sample Size

In establishing the appropriate sample size of the study, one major challenge was encountered in defining a large enough sample to satisfy the assumptions of multivariate statistical techniques. Given that the estimated total population obtained from the respective enrolment departments of all registered students within the three selected universities was very large (*N*= 65403 students; UL = 19900, VUT=17000, and NMMU=29503) the researcher, considered optimising costs and time associated with collecting data from a large sample. Nevertheless, the following two criteria was followed in determining the sample size: (a) minimum sample size to perform analysis which is considered meaningful, and (b) statistical methods of determining adequate sample sizes.

a) ***Minimum sample size:*** To perform meaningful analysis, methodology specialists recommend that larger samples be used to yield better results (Costello & Osborne, 2005; Boivin & Ng, 2006). The recommended minimum size for studies using multivariate data analysis techniques is at least 300 respondents (Briggs & MacCallum, 2003; Pallant, 2010).

b) ***Statistical method of determining adequate sample sizes:*** When determining a sample size from a large population, researchers often recommend a ratio of the number of items to respondents (Field, 2009; Podsakoff, MacKenzie, & Podsakoff, 2012), and indicate a range from 5:1 to 10:1. That is to say, at the upper extreme, for every question (or item) there should be at least 10 respondents (Pallant, 2010). Despite a great deal of contestation as to what constitutes a minimum acceptable sample, as a rule of thumb, the 10:1 criterion was applied in this study. The questionnaire (see Appendix B) contains 27 items to be factor analysed, this transforms to a minimal sample size of (27 x 10) 270 respondents from each cluster or 810 respondents for the entire study. The subsequent section highlights the response rate that was obtained from the total sample of the study.

4.7.5.1. Response Rate

Survey researchers have long assumed that one of the best way to obtain unbiased research outcome is to achieve a high response rate (Fosnacht, Sarraf, Howe, & Peck, 2017). The response rate for this study is presented in Table 4.4.

Table 4.4: Response rate

Description of Parameter	Statistic
Total number of distributed questionnaires	810
Total number of returned questionnaires	762
Unusable responses	27
Valid questionnaires retained	735
Usable response rate	90.7%

As depicted in Table 4.4, 810 questionnaires were distributed and upon completion of data collection a total of 762 questionnaires were returned back. Out of these questionnaires, twenty-seven were unusable because they were either completed wrongly or were incomplete. This culminated in a total of 735 questionnaires that were retained for data analysis purpose, giving a 90.7% response rate. Based on recommendations by researchers such as Carley-Baxter, Hill, Roe, Twiddy, Baxter, and Ruppenkamp (2009) and Morton, Bandara, Robinson, and Carr (2012), in surveys a response rate which is above 50 percent is considered acceptable.

4.7.6. Cost

Common with postgraduate studies, this present study was influenced by time and cost constraints. Cost impacts on the type of research problems and topics investigated, methodology selected, and the sampling techniques applied (Perry, 1998). To balance the sampling adequacy of inferential statistical tests together with time and cost limitations, the author resorted to group the twenty-six public South African universities into three distinctive clusters from which one representative university was selected from each cluster. The total cost of conducting the research is indicated on the research budget (See Appendix A).

4.7.7. Execution of Sampling Design

Table 4.2 indicates that the population of interest for the study was university students in South Africa. The students that participated in the study were registered for the 2018 academic year at a university. Research assistants qualified participants before collecting their responses. In total, three research assistants were recruited and assisted in collecting data. Employing a convenience sampling technique, the research assistants distributed questionnaires at strategic locations including student villages, public libraries, and lecturer halls where students frequent. Respondents were asked to drop off completed questionnaires in collection boxes placed close to the above-mentioned locations.

4.8. DATA COLLECTION INSTRUMENT

In keeping with the research objectives, the data collection instrument was constructed based on the constituent theories. Scales developed in previous studies were adapted to suit the student sample. The collected primary data can be classified into four major categories. These are: respondents' demography, mobile marketing usage patterns, Internet familiarity, and research parameters. A detailed discussion of the measurement of these attributes is continued in the following sections.

4.8.1. Measuring Consumers' Demography

To place consumer mobile marketing profile in its proper context, respondents' demographic profiles were determined. This information is potentially useful to marketers, who could use it to

map trends within the market. In practice, customers are usually segmented along demographic characteristics. Some of the common clustering bases are income (Akinci, Aksoy, & Atilgan, 2004), age (Calisir & Gumussoy, 2008) and residential area (Dick, 2007). Thus, several demographic questions were included in the questionnaire.

4.8.2. Measuring Consumers' Mobile Marketing Usage Patterns

Since the study relates to choice behaviour, it was important to establish respondents' mobile marketing usage patterns. Mobile marketing usage patterns provide vital information about consumers' usage habits of mobile marketing associated products and services. This mobile marketing usage patterns' section comprised four questions, which sought to ascertain participants' mobile marketing transactions usage behaviour. An example of such questions is: *"What do you usually do when you receive a marketing notification on your mobile device?"*

4.8.3. Measuring Consumers' Internet Familiarity

The commercialisation of the Internet has created unprecedented opportunities for businesses to engage in national and international marketing campaigns (Applegate, Austin, & McFarlan, 2006). This has also led to a rapid shift in businesses' marketing preference from the traditional marketing to innovative marketing. However, Liu and Arnett (2000) point out that the success of these marketing campaigns is determined by the market's ability to use the Internet. As a result, it became apparent for this study to ask about the respondents' familiarity with the Internet. An example of such questions is: *"How long do you use the Internet per day?"*

4.8.4. Measuring Parameters of Interest

Three parameters were identified in Section 4.7.2: (1) marketing-related mobile activity, (2) perceived information security, (3) and adoption of mobile marketing services. The first two are explanatory variables and the third is the criterion. Table 4.3 illustrates that all independent variables are continuous variables measured using a 5-point Likert scale. The dependent variable (adoption) was operationalised by whether respondents had tried using the mobile marketing platform. Continuous variables were used to measure the criterion.

All measurement scales for the parameters have already been tested and validated in past studies. To render the methodology more robust it was, therefore, prudent to adapt existing instruments (Sekaran & Bougie, 2016). Specifically, replications and extensions are most useful in research for at least two major reasons: (a) they promote generalisability of results, thus expanding the utility of the tested theory in explaining a phenomenon, even in different contexts, and (b) they guard against the perpetuation of erroneous and questionable results (Hubbard & Armstrong, 1994). This is similar to the principle of theory falsification as suggested by Calder et al. (1981), which states that theories are universal in that they can explain real-world phenomena within their domain. However, Tsikriktsis (2004) points out that this universality should be tested through replications and extensions. Those that repeatedly survive rigorous falsification attempts can be accepted as scientific explanation.

4.8.5. Questionnaire Adaptation and Modification

The data collection instrument consisted of questions measuring different aspects pertaining to respondents' demographic characteristics, mobile marketing usage profiles, Internet familiarity, and the parameters. Table 4.5 describes the structure and rationale of the questionnaire.

Table 4.5: Data Collection Instrument Format

Section	Section summary	Scale development	Rationale
A	Respondents' demographic characteristics	○ Developed for the study	To describe demographic characteristics of the respondents
B	Internet familiarity	○ Mbah (2010) ○ Developed for the study	To describe the respondent's usage pattern of the Internet
C	Mobile marketing usage	○ Beneke (2011) ○ Developed for the study	To determine the respondents' involvement in mobile marketing
D	Factors influencing consumer adoption of mobile marketing	○ Chu and Kim (2011) ○ Kim, Ferrin and Rao (2007) ○ Suh and Han (2003)	To measure the influence of marketing related mobile activity and information security on adoption

Source: Compiled for the study

In total, the questionnaire was six pages long, comprising four parts: (1) demographic section, (2) respondents' mobile marketing usage, (3) respondents' Internet familiarity, and (4) measurement scales (Table 4.5). A Likert scale (1 = Strongly Disagree; 5 = Strongly Agree) and structured questions were used. A copy of the instrument is included in the appendix (See appendix C).

4.8.6. Pilot Study and Pre-testing the Questionnaire

Following the compilation of the questionnaire, the next step was to test its effectiveness and efficiency in measuring the intended constructs. This was achieved by pre-testing the instrument (Drennan, 2003). The instrument was pilot-tested in two phases. The first stage entailed discussing the contents of the questionnaire with a panel of experts that included marketing professionals, ICT specialists, and statisticians. The overall objective was to determine whether the questionnaire adequately assessed the consumer behaviour associated with the adoption of innovative marketing. These consultations led to some changes being effected on the questionnaire.

The second phase of the pre-test was to ensure that the questions would be understood by the target audience. To achieve this, pilot testing of the instrument was undertaken using university students. In total, 50 students participated in the pilot study, 20 of whom were postgraduate and 30 undergraduates. After this, some alterations to the language were made. The results from the pilot study confirmed that for the most part, the research instrument was suitable.

4.9. VALIDITY AND RELIABILITY

To improve the quality of any study, researchers often rely on validity and reliability. The literature consistently points out that validity and reliability are the two important criteria for evaluating the robustness of any study (Blumberg et al., 2008; Healy & Perry, 2000; Malholtra, 2010). Validity is the extent to which the study measures what it sets out to measure; reliability, on the other hand, involves the accuracy and precision of measurement.

Healy and Perry (2000:121) emphasise that validity and reliability are important quality criteria used in positivistic research. To ensure a high degree of reliability as well as validity, the subsequent aspects, as commended by McKinnon (1988), were taken into consideration:

I. Carrying out an extensive review of literature – both the industry and academic literature on mobile marketing transactions were analysed in Chapter 2 and 3.
II. Using key informants – lobbying the assistance of proficient marketers and researchers to offer insights into the more recent marketing as well as technological trends of m-Commerce in South Africa.
III. Employing effective operational measures – the researcher developed a conceptual frame and propositions for the phenomena reviewed in the study by collecting data from a number of sources and using instruments that have been previously tested for validity and reliability.
IV. Carrying out a pilot study – to test variables and measuring instruments, a pilot study was conducted.

4.10. LIMITATIONS OF METHODOLOGY

This thesis, as with any research, is not free from limitations associated with the methodology (Shiu, Hair, Bush & Ortinau, 2009). The limitations as they relate to this study are as follows:

- *Sample:* a student sample was used in the study, thereby excluding other consumer groups. Results may, therefore, not necessarily be generalized to other consumer segments (Hanel & Vione, 2016).
- *Financial constraints:* since the researchers had a limited budget to conduct the research, several aspects of the methodology had to be tailored in line with the budget. For instance, the choice of the sample and data collection techniques were greatly influenced by financial constraints imposed on the thesis.
- *Time constraints:* in keeping with the requirements of the doctoral degree, this study had to be completed within a specified time frame. This, therefore, meant that certain research designs such as longitudinal methodologies could not have been used.
- *Measurement instrument:* the measurement instrument comprised of only structured questions and respondents were limited to a fixed set of responses.
- *Geographic scope:* the study was restricted to South African university students, and results may not be generalizable to other settings.

The above-mentioned limitations apply to this research and have been taken into consideration in discussing the findings.

4.11. ETHICAL CONSIDERATIONS

To protect research respondents from any potential adverse impact arising from this study, this study followed the regulations and procedures specified by the University of Venda Research Ethics Committee. To uphold high standards of ethics, the following measures were implemented:

I. The data collection instrument was submitted to the University of Venda Research Ethics Committee to ensure that it conformed to all the university's regulations.
II. Informed consent – research participants were advised of the nature of their involvement in the research beforehand. Research assistants explained to all respondents faithfully what they were required to do and their rights as participants of the research, such as their right to pull out from participation at any phase of the research. After this, all respondents' consent was required and protected before commencement of the survey.
III. Right to privacy – the personal information of respondents and their sentiments were treated confidentially. Respondents were reminded not to supply details about themselves and any other evidence that might indicate their identities.
IV. Dignity - the dignity and character of all participants were upheld and not exposed to uncomfortable behaviour.
V. Honesty – results of the study were reported honestly even when the results turned out to be contrary or different from the researcher's expectations. Moreover, studies other than the researcher's were properly cited.

4.12. CHAPTER SUMMARY

Chapter 4 described the methodology used in this study, which involved the use of a survey to collect primary data. The method applied to collect primary data was justified and described extensively throughout the chapter. The following chapter presents the findings that emerged from the data analysis.

CHAPTER FIVE

DATA ANALYSIS

5.1. CHAPTER OVERVIEW

Chapter 4 described the methodological approaches pertaining to this thesis, including methods applied to collect primary data. Subsequently, the collected data were analysed to assist in answering research questions as well as testing the proposed conceptual model and hypotheses. The results of the data analysis are presented and discussed in this chapter. However, before discussing the results an outline of the various data analysis procedures that were employed in the study is presented. The sections of the chapter, thus, are structured as follows: first, the demographic characteristics of the sample are described; thereafter, a discussion of the respondents' Internet familiarity and Internet usage patterns is done, which is then followed by a discussion outlining the respondents' mobile marketing transactions usage. Lastly, tests of hypotheses are presented.

5.2. INTRODUCTION

Following a thorough review of the existing literature on the adoption of technological innovations presented in previous chapters, a research gap regarding the adoption of marketing innovations in developing nations was identified. Specifically, within the South African context, scientific studies illustrating consumer's uptake and usage trends of mobile marketing services are still in their infancy. Consequently, this research contemplated addressing the deficiency in the body of knowledge by assessing *the relative importance of information security in moderating consumer adoption of mobile marketing transactions in South Africa*.

Since the study sought to test moderating effects as well as causal effects among variables, quantitative data were collected. These data collection processes were outlined in Chapter 4. In keeping with quantitative data, a combination of descriptive and inferential statistical analyses were conducted using SPSS v.25. In particular, the following analyses were performed:

- ***Descriptive statistics*** – to describe the sample's demographic profile and their business profiles.

- ***Chi-square tests*** – to determine associations among categorical variables.
- ***Reliability analysis*** – using Cronbach's alpha, to assess the measure of internal consistency (reliability) of the measurement scales.
- ***Factor analysis*** – to reduce variables into smaller groups of latent variables, including tests of content and criterion validity.
- ***Linear Regression analysis*** – to test the direct effects of marketing related mobile activity on adoption of mobile marketing transactions.
- ***Moderated hierarchical regression analysis –*** to test the moderating effect of information security on the relationship between marketing related mobile activity and adoption of mobile marketing transactions.

The rest of the chapter presents the results of the above analyses. In addition to this, the justification as well as diagnostics that were necessary for the tests are presented.

5.3. DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The results depicted in Table 5.1 reveal the demographic characteristics of the respondents in terms of gender, age, study status, level of study, and institution respectively.

Table 5.1: Demographic Profile of the Sample

Demographic characteristic		**Percent**
Gender	Male	54.6
	Female	45.4
Age	< 24 years	63.2
	25 - 35 years	35.8
	36 years >	1.0
Study status	Full time	94.8
	Part time	5.2
Level of study	Undergraduate	56.9
	B.Tech/Honours	22.4
	Masters	17.0
	Doctorate	3.7
Institution	UL	34.1
	VUT	32.4
	NMMU	33.5

Fewer female respondents (45.4 per cent) participated in the study compared to their male counterparts (54.6 per cent), while a significant proportion of the total respondents (63.2 per cent) fell within the age group 21-30 years. In addition, when asked to indicate whether they were full or part-time students, an overwhelming majority of respondents (94.8 per cent) indicated that they were enrolled on a full-time basis. Furthermore, in terms of the participants' level of study, most (56.9 per cent) were undergraduates followed by 22.4 per cent who were studying towards a Bachelor of Technology/ Honours degree. A further 17 per cent of the participants were enrolled for a Master's degree, while the lowest proportion of respondents (3.7 per cent) were registered for PhD. Last, the distribution of participants in terms of their institution of study showed University of Limpopo had the highest number of respondents (34.1 per cent), followed by NMMU (33.5 per cent), and at the bottom was VUT which had 32.4 per cent of the total number of respondents.

Before proceeding with further analysis of the study results, the researcher examined possible significant differences within the demographic data that may not have been readily apparent. To achieve this, cross-tabulations were conducted specifically to uncover if there were any significant institutional differences in the demographic trends relating to gender, age, study status and level of study. The results from the cross-tabulation analysis are depicted in Table 5.2 to 5.5 respectively.

Table 5.2: Cross-Tabulation of Institution vs. Gender

Cross-tabulation of Institution vs. Gender				
		Gender		
		Male	Female	**Total**
Institution	UL	17.1%	17.0%	**34.1%**
	VUT	17.6%	14.8%	**32.4%**
	NMMU	20.0%	13.5%	**33.5%**

X^2=0.79; p > .05; phi = 0.10.; p>.05

As presented in Table 5.2, the results of the Chi-square test (χ^2 = 0.79, p > .05) are statistically insignificant revealing that there were no visible differences in the gender distribution across the three institutions.

Table 5.3: Cross-Tabulation of Institution vs. Age

Cross-tabulation of Institution vs. Age					
		Age			
		18-24 years	25-35 years	36+ years	**Total**
Institution	UL	24.1%	9.7%	0.3%	**34.1%**
	VUT	20.0%	12.2%	0.2%	**32.4%**
	NMMU	19.1%	13.9%	0.5%	**33.5%**

X^2=3.013; p > .05; Cramer's V = 0.45.; p>.05

Analysing the cross-tabulation results depicted in Table 5.3 also reveal that the distribution of the respondent's age did not significantly differ across the three universities respectively (X^2=3.013; p > .05).

Table 5.4: Cross-Tabulation of Institution vs. Study Status

Cross-tabulation of Institution vs. Study Status				
		Study Status		
		Full-time	Part-time	**Total**
Institution	UL	33.1%	1%	**34.1%**
	VUT	30.6%	1.8%	**32.4%**
	NMMU	31.1%	4.4%	**35.5%**

X^2=3.574; p > .05; Cramer's V = 0.70.; p>.05

Furthermore, the results of the Chi-square test (χ^2 = 79.739, p = .000) depicted in Table 5.4 reveal that across the three universities the demographic characteristics of the respondent in terms of their study status did not significantly differ. These results are also similar to the Chi-square test relating to respondents' institution vs. level of study (X^2=3.852; p > .05) as outlined in Table 5.5.

Table 5.5: Cross-Tabulation of Institution vs. Study Level

Cross-tabulation of Institution vs. study Level						
		Study Level				
		Undergraduate	Honours	Masters	PhD	**Total**
Institution	UL	20.2	7.1	5.7	1.1	**34.1**
	VUT	19.2	6.9	5.1	1.2	**32.4**
	NMMU	18.5	8.4	7.1	1.5	**35.5**

X^2=3.852; p > .05; Cramer's V = 0.51.; p>.05

The cross-tabulation results as evident in Table 5.2 - 5.5 respectively do not significantly deviate from the demographic characteristics of the overall combined sample of the study as depicted earlier in Table 5.1. The subsequent section outline the respondents' Internet familiarity.

5.4. INTERNET FAMILIARITY

To investigate the extent to which the student market in South Africa utilises Internet technology, respondents' Internet familiarity profiles were ascertained. In this study's context, familiarity is operationalised to mean consumers' experience in using the Internet in general. As proffered by Du (2011), familiarity affects consumer decision making and is considered to be a central construct with which to explain consumer choice processes. Consistent with this notion, since a greater proportion of mobile marketing transactions are carried out via the Internet, chances are high that there is a positive relationship between the respondents' familiarity with the Internet and their likelihood of adopting mobile marketing transactions (See Table 5.2). Consequently, the various factors which contribute to Internet familiarity are briefly discussed in the subsequent sections, beginning with whether the respondents used the Internet or not.

5.4.1. Respondents' Internet Usage

Regarding Internet usage, out of the 735 valid responses, all participants (100 per cent) revealed using the Internet. This distribution of respondents is so typical of university students in South Africa and globally due to digitalisation which saw the Internet emerging as a vital component in the fulfilment of their academic curricular. An earlier report by USA Today (1996; cited by Perry,

Anne Perry, & Hosack-Curlin, 1998:136) highlighted that with the growing numbers of colleges and universities, Internet access is viewed by faculty and students as a core resource and a basic right, 'similar to a library card'. This signifies the extent to which the Internet is considered fundamental by students. Also in support of this notion, (Pillay, 2016) states that the introduction of virtual learning in most tertiary institutions globally has rendered the Internet a key service for scholars. Due to students' reliance on the Internet to fulfil their daily mandates, as shown in the literature (Bankole & Oludayo, 2012; Levin & Arafeh, 2002; Judd & Kennedy, 2010) it makes them an attractive market for online retailers. Furthermore, this finding also reinforces the rationale for selecting students as participants in this study, based on their technology-savviness.

5.4.2. Period of Respondents' Internet Familiarity

In this section, respondents were asked to indicate the number of years they had familiarised themselves with the Internet. The distribution of their responses to the question is shown in Figure 5.1.

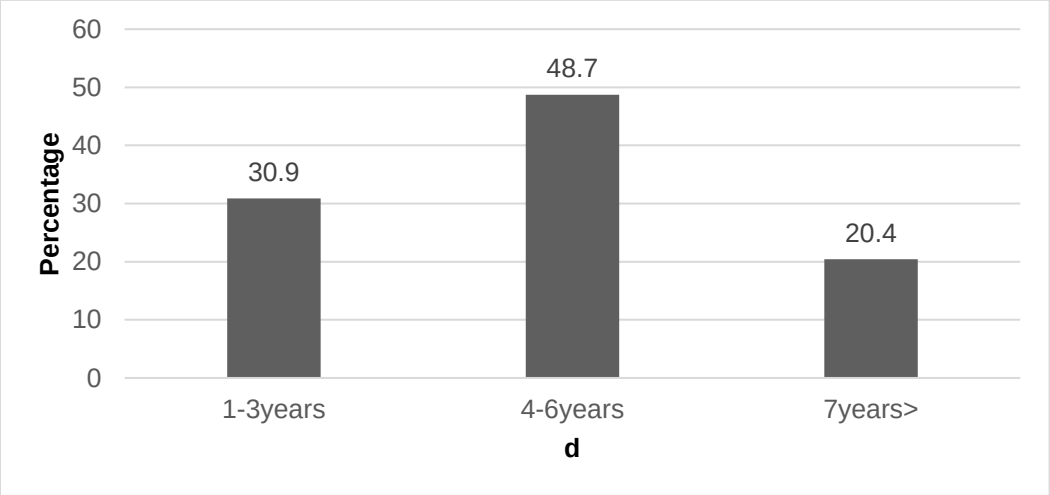


Figure 5.1: Period of Internet Familiarity

The results in Figure 5.1 indicate that most respondents (48.7 per cent) were familiar with the Internet for a period of 4-6 years, while the second largest percentage of the total respondents (30.9 per cent) indicated being familiar with the Internet for a period of 1-3 years. The results further reveal that a lower proportion of respondents (20.4 per cent) as compared to those falling under the 1-3 years category, were familiar with the Internet for seven and more years. The finding

supports previous studies that were conducted among South African university students (Chigona, Kankwenda, & Manjoo, 2008; Donga, 2017; Shambare, Rugimbana, & Sithole, 2012) which established that majority of respondents had Internet experience of more than three years. Relating the results to innovation adoption, the implication is that on the five-step continuum to adopting an innovation (Rogers, 2003), the use of Internet among South African students can be considered as being at the adoption stage - as more than half (69.1 per cent) of respondents were familiar with the Internet for more than four years. As a result, this aptly places the respondents within the 1-3 years category to typically be categorized under the 'trial' stage on the five-step continuum to innovation adoption. To test this notion, a cross-tabulation of study level and period of Internet familiarity was performed (See Table 5.6).

Table 5.6: Cross-Tabulation of Study Level vs. Internet Familiarity

Cross-tabulation of study level vs. Internet familiarity				
		Internet familiarity		
		1-3 years	4+ years	**Total**
Study level	Undergraduate	30.5%	26.4%	**56.9%**
	Postgraduate	0.4%	42.7%	**43.1%**

X^2=339.474; p < .05; phi = .680; p<.05

As presented in Table 5.6, the results of the Chi-square test (χ^2 = 339.474, p = .000) reveal a significant association between respondents' study level and Internet familiarity. The strength of the association (*phi* = .680) depicts a very strong effect size, which further confirms a significant association between the two variables. These results support the above-mentioned notion and, hence, place most of the undergraduate students within the trial stage on the five-step continuum to innovation. This is evident as most respondents (30.5 per cent) who were familiar with the Internet for a period of 1-3 years were undergraduates, while only 0.4 per cent were postgraduate students. On the other hand, the larger proportion of respondents (42.7 per cent) who were familiar with the Internet for a period of four and more years were postgraduates. In contrast, undergraduates who were familiar with the Internet for a period of more than four years constituted slightly more than half (26.4 per cent) of postgraduate students. This result also validates the earlier finding that consumers who are familiar with the Internet for a period of more than 4 years could be classified within the adoption stage.

According to Varma Citrin, Sprott, Silverman, and Stem (2000), individuals using the Internet for a considerable period of time even for purposes other than shopping will have a higher propensity to use the Internet for marketing related purposes. To validate this assertion, it became essential to further investigate whether the respondents who were familiar with the Internet for four and more years were more involved in m-Commerce activities, as compared to those within the 1-3 years period. Thus, a further cross tabulation of primary use of the Internet and Internet familiarity was conducted (See Table 5.7).

Table 5.7: Primary Use of Internet vs. Internet Familiarity

Cross-tabulation of primary use of Internet vs. Internet familiarity				
		Internet familiarity		
		1-3 years	4-6 years	**Total**
Primary use of Internet	Information and product search	3.1%	17.7%	**20.8%**
	Purchasing	0.1%	5.8%	**6.0%**
	Communication	15.6%	24.5%	**40.1%**
	Entertainment	11.2%	17.3%	**28.4%**
	Online banking/bills	0.8%	3.8%	**4.6%**

X^2=59.970; p < .000; phi = .286; p<.05; Cramer's V = .202 p<.05

The results of the Chi-square test ($\chi^2 = 59.970$, $p = .000$) indicate a significant association between primary use of Internet and Internet familiarity. The strength of the relationship (*df* =4, *Cramer's V* = .202) is relatively strong, which confirms a significant association between the two variables. In addition, results in Table 5.4 show that the proportion of respondents who had been familiar with the Internet for a period of four and more years was larger in all categories of the primary uses of the Internet as compared to the 1-3 years category. Of significance for this study, however, are uses such as information and product search, purchasing, and online banking which are all linked to m-Commerce. These m-Commerce activities had the largest proportion of respondents within the four and more years of Internet familiarity category (17.7 per cent, 5.8 per cent, & 3.8 per cent respectively) compared to the 1-3 years category (3.1 per cent, 0.1 per cent, & 0.8 per cent). A conclusion can, therefore, be advanced that consumers with more years of Internet familiarity are highly likely to be involved more in mobile marketing transactions than those with less years of Internet familiarity.

5.4.3. Respondents' Period of Internet Use per Day

In order to eliminate possible uncertainties surrounding the question of whether the majority of South African university students have reached the Internet adoption stage, respondents were asked a further probing question to reveal their actual daily usage of the Internet. The results from their responses are shown in Figure 5.2.

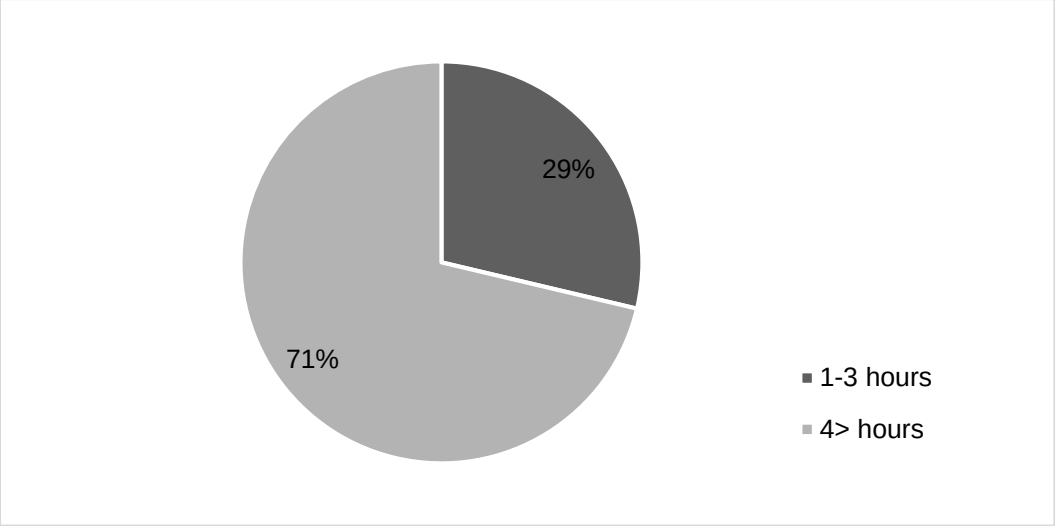


Figure 5.2: Use of Internet Daily

Figure 5.2 depicts that daily, a greater proportion of respondents (71 per cent) were connecting to the Internet for more than four hours, while the remaining respondents (29 per cent) indicated connecting to the Internet for a period of only 1-3 hours daily. These findings confirm the researcher's postulation which is conferred in Section 5.4.2 of South African university students having reached the Internet adoption stage as the majority were spending more hours (4> hours) on the Internet daily as compared to those who spent less hours (1-3 hours). Shambare et al. (2012) attribute this behaviour to being largely underpinned by the popularity of social networking sites among students; this has resulted in them using the Internet more frequently. On the other hand, Ajiboye and Tella (2007) state that due to students' information seeking behaviour, a majority of them nowadays resort to the Internet as their primary source of obtaining information. These two studies give evidence to the utilisation of the UGT as the underpinning theory of this study. Guided by the UGT, the researcher asserts that it is the student's use of the Internet for utilitarian (information seeking) and hedonic (social networking) purposes which ultimately results in them adopting mobile marketing transactions.

5.4.4. Respondents' Rating of Internet Speed

The question in this section sought to determine the respondents' perceptions pertaining to Internet connectivity within their respective areas. The respondents were asked to indicate the Internet speed of their network service providers and the results to the question are shown in Figure 5.3.

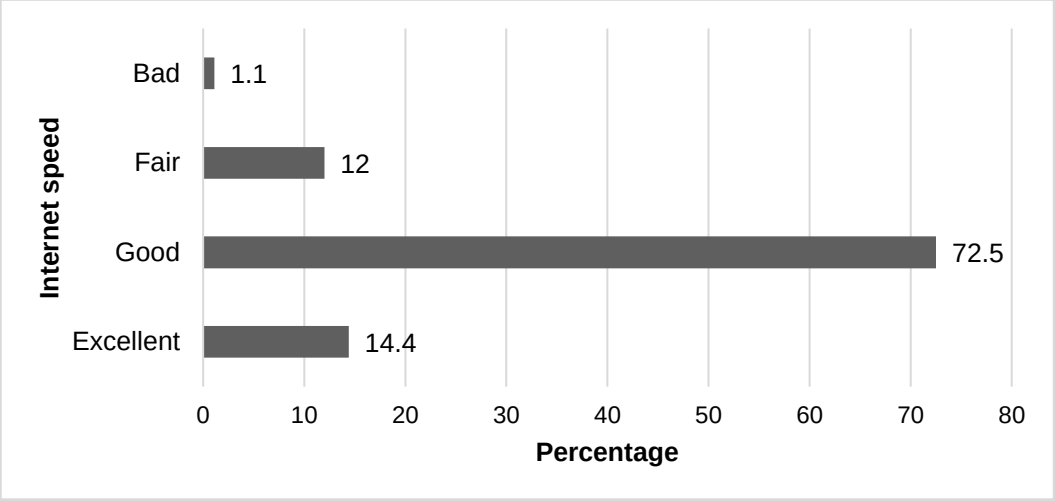


Figure 5.3: Respondents' Internet Speed

The results presented in Figure 5.3 indicate that of the 735 students who participated in this study, about 14.4 per cent indicated using Internet with excellent speed, 72 per cent stated that their Internet speed was good, a further 12 per cent revealed that it was fair, while approximately 1.1 per cent indicated that the Internet speed was bad. These results demonstrate that by and large, there is good Internet speed in South Africa. Maseko (2017) points out that although Africa is lagging in terms of Internet connectivity and speed, South Africa is not so far behind as it is ranked third in Africa and has a download speed of 4.36 Megabits Per Second (Mbps). The least responses (1.1 per cent) that indicated bad Internet speed can be attributed to the different mobile service providers in South Africa - the leading being MTN, Vodacom, and Cell C (Opensignal, 2017). Thus, within some areas other network service providers might not be able to transmit good signals, resulting in slow Internet connection.

Corbitso, Ash, and Pisone (2011) point out that successful operation of m-Commerce is based on time sensitivity at any stage from information search, evaluation of alternatives, to the actual

purchase decision stage of the buying decision process. In addition, the time sensitivity factor according to Lichtenstein and Williamson (2006) is also influential in creating consumer trust for online retailers, as security fears can be invoked in consumers if an online transaction takes a longer period to execute. Thus, good Internet speed also eliminates security fears and ensures ease of use when performing an online mobile transaction as there is quick interactivity between the consumer and the online business. This, therefore, implies that to reduce information security concerns, service providers need to ensure that they constantly monitor their Internet speed, as slow connections often delay the verification and authentication process when performing online transactions.

5.5. MOBILE MARKETING USAGE

To investigate the extent to which the tertiary student market in South Africa is adopting innovative marketing technology, respondents' mobile marketing usage patterns were established. The results from the responses are shown in the subsequent sections.

5.5.1. Daily Frequency of Receiving Marketing Related Notifications

This section provides information about respondents' frequency of receiving marketing related notifications on their mobile devices. This section was deemed important in order to determine whether South African online retails are doing enough to reach out to consumers through the mobile platform. The results from the respondents are shown in Figure 5.4.

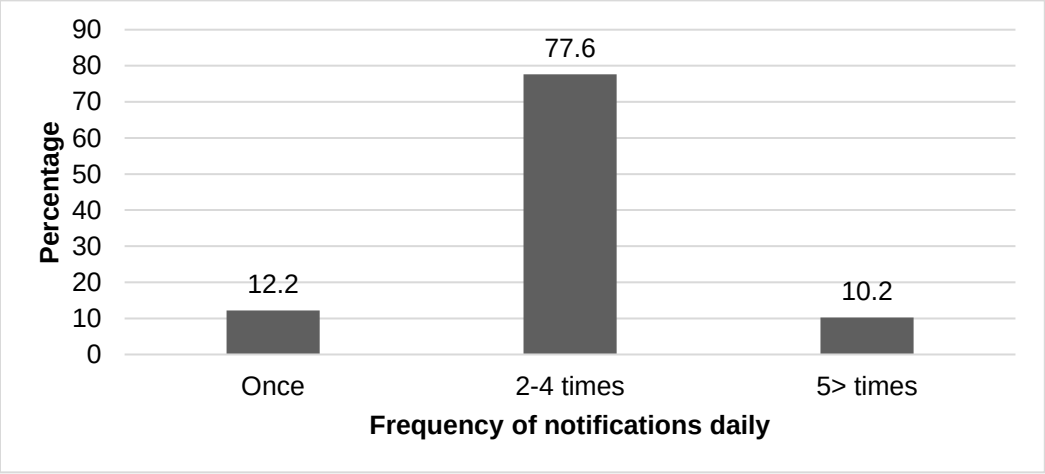


Figure 5.4: Frequency of Marketing Notifications Daily

The results in Figure 5.4 show that a greater proportion of respondents (77.6 per cent) on average received mobile marketing notifications 2-4 times daily, followed by 12.2 per cent who indicated receiving marketing notifications only once a day. The least percentage (10.2 per cent) of respondents received mobile marketing messages 5 or more times per day. Findings in this study are consistent with the study conducted on consumer acceptance of mobile marketing through mobile phones among South African university students by Donga (2017), where the majority of respondents indicated receiving mobile marketing messages 2-4 times a day. These results imply that there is an active mobile marketing platform in South Africa.

5.5.2. Reaction to Mobile Marketing Notifications

In this section, respondents were asked to indicate their reaction when they receive marketing notifications on their mobile devices. The question sought to gather information regarding participants' responsiveness to mobile marketing notifications. Heinonen and Strandvik (2007) regarded responsiveness as a function of consumers' perceived relevance of the marketing notification as well as of the disturbance/acceptance of the context of receiving the message. The respondents' reactions to mobile marketing notifications are, therefore, presented in Figure 5.5.

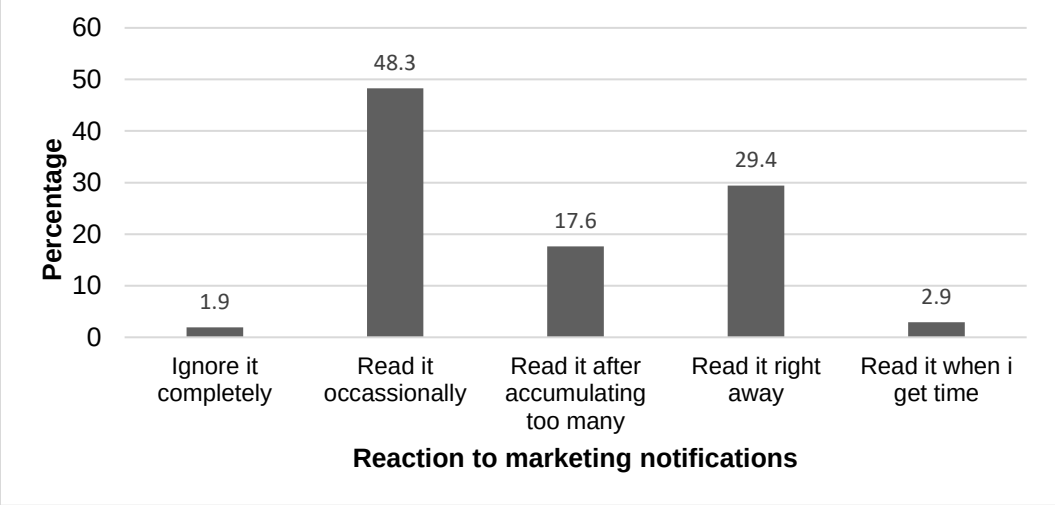


Figure 5.5: Reaction to Marketing Notifications

It is clear from Figure 5.5 that most respondents (48.3 per cent) only read the messages occasionally, whilst 29.4 per cent elected to read the messages right away. Thus, out of the 735 valid responses, only 135 revealed responding to a marketing notification instantly. The remaining

22.4 per cent of the respondents chose to either completely ignore marketing notifications (1.9 per cent), read them after accumulating too many (17.6 per cent), or read them when they got time (2.9 per cent). This implies that South African university students do not appear to put a great deal of effort into reading and evaluating the various mobile marketing notifications. This behaviour seems not to be common amongst South African students only, as Persuad and Azhar (2012) also established similar findings. The authors established that even though mobile usage is positively related to the adoption of mobile marketing for Canadian university students, it is not the case. The authors reveal in their study that students tend to show a weak openness for marketing techniques through their mobile devices even though they like spending much time browsing on the Internet. Izquierdo-Yusta, Olarte-Pascual, and Reinares-Lara (2015) single out intrusiveness of marketing notifications as the leading cause of this lack of interest, as most notifications were considered unsolicited. The authors caution marketers against sending out too many notifications to consumers.

To establish whether the participants' weak responsiveness towards mobile marketing notifications as depicted in Figure 5.5 had any significant association with their daily frequency of receiving marketing notifications, a cross-tabulation (See Table 5.8) was performed.

Table 5.8: Cross-Tabulation of Reaction to Marketing Notifications vs. Frequency of Daily Notifications

Cross-tabulation of reaction to marketing notifications vs. frequency of daily notification					
		Frequency of daily notifications			
		Once	2-4 times	5>times	**Total**
Reaction to marketing notifications	Ignore it completely	0.7%	1.0%	0.3%	**1.9%**
	Read it occasionally	6.0%	38.9%	3.4%	**48.3%**
	Read it after accumulating to many	1.6%	14.7%	1.2%	**17.6%**
	Read it right away	3.3%	22.4%	3.7%	**29.4%**
	Read it when I get time	0.4%	1.6%	0.8%	**2.9%**

X^2=79.739; p < .000; Cramer's V = .233 p<.05

The results of the Chi-square test (χ^2 = 79.739, p = .000) reveal a significant association between reaction to marketing notifications and frequency of daily notification. The strength of the relationship (*df* =4, *Cramer's V* = .233) is also strong, which further confirms a significant

association between the two variables. As shown in Table 5.8, the percentage of the respondents' various reactions to marketing notifications grows with the increase of daily notifications from once to 2-4 times daily. Furthermore, as the frequency increases to five and more times the proportion of the respondents' reaction decreases marginally. This result validates the earlier findings by other researchers (Izquierdo-Yusta et al., 2015; Rigollet & Kumlin, 2015) that the risk of sending an excessive amount of notifications is that it may result in irritation and prompt the user to discontinue usage. Barwise and Strong (2002) suggest that up to three notifications or advertisements daily was a sensible amount noting that younger segments in particular were susceptible to receiving a larger amount of notifications.

5.5.3. Mobile Marketing Convenience

In this section, the respondents were asked whether they agreed that mobile marketing transactions reduced their shopping efforts. The researcher sought to establish if indeed as highlighted in the literature review, mobile marketing was perceived by respondents as convenient when compared to traditional marketing channels. The results from the responses are highlighted in Table 5.9.

Table 5.9: Mobile Marketing Transactions Convenience

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD
I conduct mobile marketing transactions where I can reduce my shopping efforts as much as possible.	3.8%	10.5%	15.2%	20.0%	50.5%	4.03	1.192

The perceived convenience in Table 5.9 of using mobile marketing transactions was measured with a positive result, as the majority of students (50.5 per cent) strongly agreed, while (20 per cent) agreed that it would in fact be more convenient for them to use their mobile devices for online transactions as it would reduce as much as possible their shopping efforts, for instance in traveling, walking, parking, waiting, and carrying. Table 5.9 further reveals that 15.2 per cent of the respondents neither agreed nor disagreed, and this could indicate a lack of information and awareness among students surrounding the capabilities of mobile marketing transactions. The negative perceptions towards the convenience of mobile marketing transactions measured to 3.8 per cent for those who strongly disagreed and 10.5 per cent for the respondents who disagreed.

These results confirm the findings by other studies (Corbitso et al., 2011; Jih, 2007; Yang, 2005) which established that indeed it would be more convenient to conduct mobile commerce as opposed to traditional brick and mortar commerce.

5.5.4. Respondents' Use of the Internet for M-Commerce Services

The results in Section 5.4.1 show that university students have widely embraced Internet technology as an integral component of their daily routines. Thus, in line with the purpose of this study, it was deemed imperative to further ascertain the respondents' use of the Internet for m-Commerce related services. Therefore, other than for academic purposes, the respondents were asked to reveal their primary use of the Internet and the results are presented in Figure 5.6.

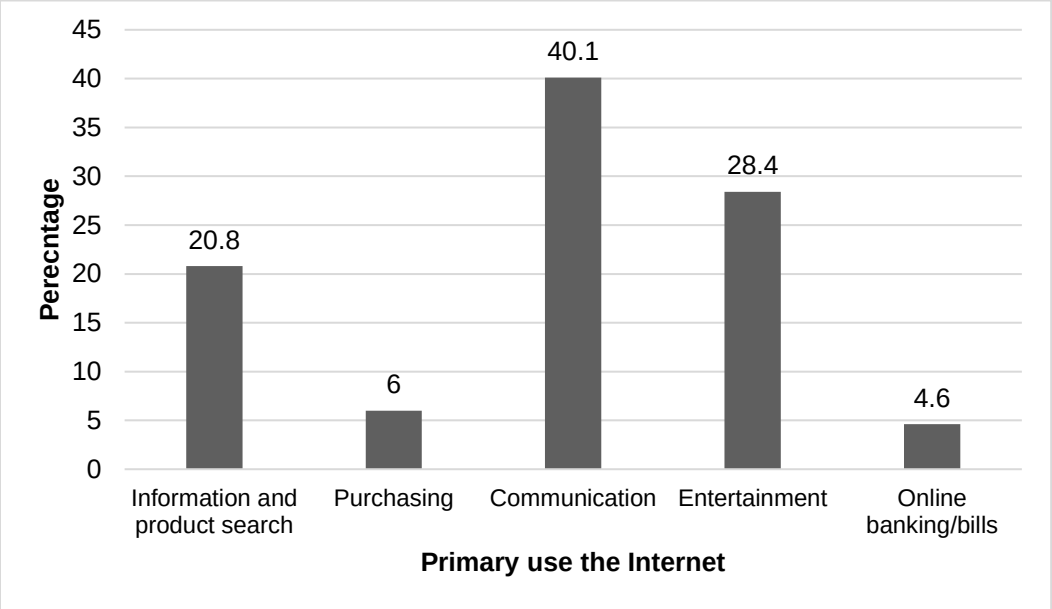


Figure 5.6: Primary use of the Internet

From the results presented in Figure 5.6, some 20.8 per cent of the respondents indicated that besides academic related browsing, they mostly used the Internet for information and product search. In addition, approximately 6 per cent revealed using the Internet for making online purchases, while 40.1 per cent utilised the Internet for communication through emails and social media such as Facebook, Twitter, WhatsApp, and Instagram. Furthermore, 28.4 per cent of the respondents spent their Internet time on entertainment, for instance games, music, and videos, whilst on the other hand 4.6 per cent used the Internet for online banking as well as online

payment of bills. These findings, therefore, show that the majority of students (68.5 per cent) primarily used the Internet for communication and entertainment, while almost half of these (31.4 per cent) for mobile commerce related activities.

From these findings, it would appear that, South African university students are still lagging as far as the use of mobile commerce is concerned. Furthermore, based on the theoretical underpinning of the study (UGT), these results imply that students' use of mobile Internet technology is largely driven by hedonic factors such as social interaction and entertainment. This deduction is reinforced by earlier scholars (Lu, Yao, & Yu, 2005; Jones, 2008) who established that students' use of the Internet via mobile devices is mainly due to the need for enhancing their private and social lives. Consequently, Persaud and Azhar (2012) suggest that for marketers to develop successful mobile marketing strategies, a thorough understanding of why and how youthful consumers may want to participate in mobile marketing is required.

5.5.5. Type of Mobile Marketing User

In this section, respondents had to state whether, as far as mobile marketing transactions are concerned, they would classify themselves as either visitors (who look for general product information only), browsers (who look for specific information but would not transact online) or Internet buyers (who look for specific product information and would buy online). The respondents' opinions are reflected in Figure 5.7.

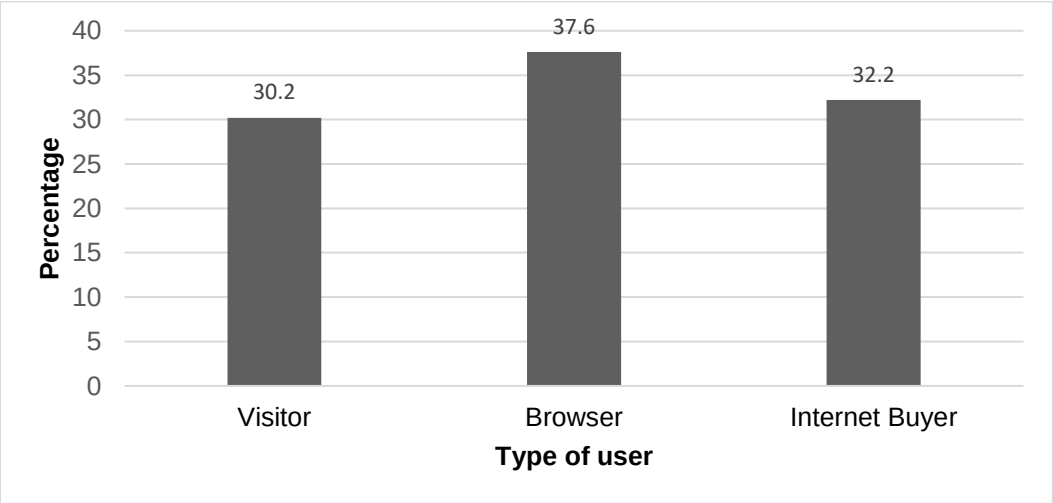


Figure 5.7: Type of Mobile Marketing User

The results presented in Figure 5.7 reveal that of the 735 respondents that completed the questionnaire, the majority (37.6 per cent) were browsers. Internet buyers constituted 32.2 per cent, while a slightly less proportion of respondents (30.2 per cent) were visitors. Despite the proportion of the actual Internet buyers being slightly lower when comparing to the proportion of browsers, the results indicate the pervasiveness of the Internet as a medium of acquiring product/service information. Thus, the results imply that South African students are well informed consumers as they actively seek for product information on the Internet. Furthermore, the results attest to the potential of the students as an attractive online mobile market, and marketers need to device effective strategies of converting visitors and browsers to paying customers (Internet buyers).

5.6. TEST FOR ITEM RELIABILITY AND VALIDITY

It was also important to determine the reliability and validity of the measurement items used to collect data, since the quality of any study relies on accurately measuring the constructs under study. Marketing research specialists including Blumberg et al. (2011), Malholtra (2010), and Shiu et al. (2009) demonstrate that measurement accuracy is a function of two things: (a) the extent to which the study measures what it sets out to measure, and (b) the precision with which the phenomena are measured. The former defines validity, and the latter reliability. The measurement of construct reliability and construct validity are discussed next.

5.6.1. Construct Reliability

Cronbach's alpha was used to measure the reliability of the multi-item scales of the questionnaire (Mazzocchi, 2011). Ensuring high levels of reliability was critical in order to minimise bias and to provide a rigorous test for theory (Calder, Phillips & Tybout,1981). Consequently, the standard practice of setting the minimum alpha threshold of 0.7 was considered (Field, 2009; Pallant, 2010). Table 5.10 illustrates the Cronbach's alpha associated with each of the 6 scales comprising the questionnaire.

Table 5.10: Cronbach's Alpha for the Sub-Scales

Multi-item scale	Cronbach's alpha
Providing Information	.888
Sharing content	.831
Accessing content	.938
Protection	.892
Authentication	.702
Verification	.845

As illustrated in Table 5.10, all the scales were observed to have very high measures of reliability, thereby suggesting a satisfactory measure of internal consistency (Pallant, 2010).

5.6.2. Construct Validity

Closely related to the concept of reliability is construct validity, which Blumberg et al. (2011:344) define as an instrument's 'ability to accurately measure the phenomena it purports to measure'. Construct validity is rooted in the interplay of two forms of validity – convergent and discriminant validity. To establish high levels of construct validity of the scale, the following measures were undertaken (Blumberg et al., 2011):

(1) ***Content validity:*** extensive literature review as well as consultation with marketing researchers and consumer behaviour experts on the viability of the proposed conceptual frame. Some alterations were subsequently made to the questionnaire.
(2) ***Criterion validity:*** ensuring predictive power of the questionnaire. To ensure criterion validity and enhance predictive power of the questionnaire, the following tactics were employed:

> ***(a) Adapting scale:*** validated scales that correctly measure phenomena under study (Hubbard & Armstrong, 1994).
>
> ***(b) Large sample:*** the researcher collected data from a large sample (n = 810) to induce representativeness and to minimise bias (Diamantopoulos & Schlegelmich, 2000).
>
> ***(c) Reliability:*** using reliable and internally consistent data (see Section 5.6.1).

Subsequently, principal components analysis (PCA) was employed to determine the validity of the independent variables. Requirements to proceed with PCA were determined via the sample size ratio of cases to items, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the

Bartlett's test of Sphericity (Pallant, 2011). Firstly, the ratio of the number of cases to items in the questionnaire exceeded the prescribed minimum of 5 cases (or respondents) to each item (or question) (Pallant, 2011:183). Secondly, the range of the KMO index falls between 0 and 1; Kaiser (1974; cited in Field, 2013) recommends accepting values greater than 0.5 as sufficient enough to proceed with PCA. Lastly, the Bartlett's test, in all cases, yielded highly significant p-values ($p < 0.05$).

Having satisfied the above-mentioned requirements, PCA was conducted on all 6 scales to test convergent validity against the hypothesized correlations among items within latent variables (or factors). Also, the latter technique was used to assess the individuality of dimensions (or predictors) in as far as explaining adoption behaviour was concerned. Tables 5.7 below summarises the PCA results.

Table 5.11: KMO and Bartlett's Test of Independent Variables

Variable	KMO	Bartlett's test		Percentage variance
		Chi-Square	P-value	
Providing information	.792	1777.832	.000	75%
Sharing content	.500	516.852	.000	85%
Accessing content	.648	4970.098	.000	85%
Protection	.796	1842.955	.000	76%
Authentication	.500	253.629	.000	77%
Verification	.845	1292.000	.000	69%

Upon extraction, all the items within the six scales comprising the questionnaire scored communalities above 0.5, which according to Field (2013) is considered satisfactory. Furthermore, the component matrix output after extraction for all the six scales yielded high and distinct factor loadings greater than 0.4, thereby supporting the assumptions of construct validity.

5.7. TEST OF MARKETING RELATED MOBILE ACTIVITY EFFECT ON ADOPTION

To test the direct effect posed by marketing-related mobile activity on adoption of mobile marketing, a linear regression analysis was utilised. A total of three marketing-related mobile activity variables (i.e. providing information, sharing content, and accessing content) were identified as primary factors affecting adoption of mobile marketing transactions among the student consumers. Consequently, the linear regression model: $\boldsymbol{y = a + bx + e}$ was individually

applied to test each marketing-related mobile activity dependent variable with the independent variable (adoption of mobile marketing transactions).

The regression model consists of:

(a) Y = Dependent variable
(b) X = Independent variable
(c) a = Y-axis intercept
(d) b = Beta or the coefficient of X (independent variable)
(e) e = Error term

So, the value of beta indicates whether the dependent and independent variables are positively or negatively related. In other words, when the independent variable increases, at what rate would the dependent variable increase? As a corollary, a positive beta indicates a positive relationship and the converse is also true. The p-value was used to assess the significance of the beta score. A significant relationship is a p-value less than 0.05. If the p-value was observed to be greater than 0.05, then the relationship was found to be non-significant. After determining a favourable p-value, the R-square was used to depict the strength of the relationship. The higher the R-square, the stronger the relationship; a lower R-square depicted a weak relationship.

5.7.1. Hypothesis 1: Greater Degree of Mobile Activity Linked to Providing Information will Result in Greater Mobile Marketing Transactions Adoption.

The rationale of this hypothesis was to test the relationship between marketing related activity of providing information to online retails and adoption of mobile marketing transactions. The assumption was that the more an individual is involved in providing information to online retails, the greater the likelihood of conducting transactions online. Table 5.12 summarises the results of the linear regression for **H_1**.

Table 5.12: Model Summary

Dependent Variable: Adoption of Mobile Marketing Transactions						
	B	**Std.Error**	***β***	***t***	***p-value***	**Decision**
Constant	1.112	.105				
Providing information	.703	.028	.680	25.143	.000	Supported
Model F= 632.167 R^2 = .463						

Table 5.12 shows the standardized regression coefficient of each predicator, R^2, F and β in linear regression analysis. The entire model reveals a significant effect of providing information to online stores on adoption of mobile marketing transactions ($F_{(1,733)}$ = 632.167, p<0.05). In addition, analysing the effect size (R^2 = 0.463) shows that marketing-related mobile activity of providing information to online retails explained adoption of mobile marketing transactions with power of 46.3 per cent. Furthermore, as depicted in Table 5.12, the standardized coefficient (beta) value for providing information is positive (β =0.680) and significant (p<.05), and thus supports hypothesis **H_1**. A conclusion can, therefore, be advanced that a greater degree of mobile activity linked to providing information will result in greater mobile marketing transactions adoption by consumers.

5.7.2. Hypothesis 2: Greater Degree of Mobile Activity Linked to Sharing Content will Result in Greater Mobile Marketing Transactions Adoption.

The substantiation of this hypothesis was to test the relationship between marketing related activity of sharing content and adoption of mobile marketing transactions. The assumption was that the more an individual is involved in sharing marketing related content with others, the greater the likelihood of conducting transactions online. Tables 5.13 summarises the results of the linear regression for **H_2**.

Table 5.13: Model Summary

Dependent Variable: Adoption of Mobile Marketing Transactions						
	B	**Std.Error**	***β***	***t***	***p-value***	**Decision**
Constant	3.444	.104				
Sharing content	.064	.031	.075	2.037	.042	Supported
Model F= 4.150 R^2 = .060						

Studying the output of the linear regression analysis, the test for the effect of sharing content on adoption of mobile marketing transactions ($F_{(1,733)}$ = 4.150, p<0.05) reveals a significant relationship between the two variables. However, further analysis of the effect size depicts a low (R^2= 0.060) predictory power of the independent variable. This entails that only 6 per cent of total variation in the adoption of mobile marketing transactions was explained by sharing content. Furthermore, as highlighted in Table 5.13, the standardized coefficient (beta) value for providing information is very low but, however, positive (β =0.75) and significant (p=042), and thus supports hypothesis **H_2**. A deduction can, therefore, be advanced that a greater degree of mobile activity linked to sharing content will result in greater mobile marketing transactions adoption by consumers.

5.7.3. Hypothesis 3: Greater Degree of Mobile Activity Linked to Accessing Content will Result in Greater Mobile Marketing Transactions Adoption.

The rationale of **H_3** was to examine the relationship between marketing related activity of accessing content from online retails and adoption of mobile marketing transactions. The premise was that the more an individual is involved in accessing content from online retail websites, the greater the likelihood of conducting mobile marketing transactions online. Tables 5.10 summarises the results of the linear regression for **H_3**.

Table 5.14: Model Summary

Dependent Variable: Adoption of Mobile Marketing Transactions						
	B	**Std.Error**	***β***	***t***	***p-value***	**Decision**
Constant	1.720	.093				
Accessing content	.559	.025	.630	21.954	.000	Supported
Model F= 481.989 R^2 = .397						

Table 5.14 shows the standardized regression coefficient of each predicator, R^2, F and β in linear regression analysis. The entire model highlights a significant effect of accessing content from online stores on adoption of mobile marketing transactions ($F_{(1,733)}$ = 481.989, p<0.05). In addition, analysing the effect size (R^2 = 0.397) reveals that marketing related mobile activity of providing information to online retails explained adoption of mobile marketing transactions with power of 39.7 per cent. Furthermore, as portrayed in Table 5.14, the standardized coefficient (beta) value for providing information is positive (β =0.630) and significant (p<.05), and thus supports

hypothesis **H_3**. A conclusion can, therefore, be extended that a greater degree of mobile activity linked to accessing content will result in greater mobile marketing transactions adoption by consumers.

As projected in the study, in order to increase the explanatory power of the model, perceived information security was proposed as an important moderator variable which needs to be considered when examining consumer adoption behaviour towards m-Commerce. This suggests that marketing related mobile activity alone is not a sufficient predictor of consumer behaviour towards adoption of m-Commerce unless information security perceptions are contemplated. Thus, it became imperative for this study to further probe the moderating effect of information security on the relationship between marketing-related mobile activity and adoption of mobile marketing transactions.

5.8. TESTS OF MODERATING EFFECTS OF PERCEIVED INFORMATION SECURITY ON ADOPTION

Moderator variables have enjoyed a surge of popularity in the marketing literature in recent years, and scholars (e.g., Baron and Kenny, 1986; McMullan, 2005; Wang, Wang, Xue, Wang, & Li, 2018) have acknowledged their importance for predicting consumer behaviour. Contemporary marketing scholars (e.g., Alsaad, Mohamad, & Ismail, 2017; Khan, Hameed, & Khan, 2017; Slade, Dwivedi, Piercy, & Williams, 2015) in particular have exhibited increasing interest in moderator variables, especially with respect to behavioural trends exhibited by consumers when using innovative technology. The choice to include a moderated model was furthermore informed by the fact that studies such as those by McGoldrick and Pieros (1998) and later Islam, Khan, Ramayah, and Hossain (2011) explicitly determine how moderating variables form the basis for much of the research in psychology and consumer behaviour, in that the relationship between variables becomes more pronounced when moderators are included; for example, in Venkatesh's UTAUT. For that reason, specifically to enhance the model's explanatory power, the moderation effects of information security on the relationship between marketing-related mobile activity and adoption of mobile marketing transactions were studied. Chapter 3 provides a complete discussion of, and justification for, using moderators in the proposed conceptual frame (see Section 3.7).

- To conduct the various tests of moderation pertaining to the study, moderated hierarchical regression analysis was conducted using the PROCESS macros in SPSS (Hayes, Montoya, & Rockwood, 2017). In the hopes of facilitating the wide-spread adoption of the latest techniques, methodologists (Hayes, 2012; Imai, Keele, Tingley & Yamamoto, 2010; Tofighi & MacKinnon, 2011) have developed and published various computational tools in the form 'macros' or 'packages' for popular and readily-available statistical software such as SPSS, SAS and, more recently, R. The PROCESS macro has become especially popular for modern moderation analysis in business and marketing (and many other fields as well), as evidenced by its appearance in a variety of business journal articles (e.g., Boerman, Willemsen, & Van Der Aa, 2017; De Pelsmacker, Van Tilburg, & Holthof, 2018; Grimmer, Kilburn, & Miles, 2016; Leal-Rodríguez, Eldridge, Roldán, Leal-Millán, & Ortega-Gutiérrez, 2015).

- By using the PROCESS macro to perform the hierarchical moderated regression analysis the researcher particularly considered the fact that, the proposed model for the study was relatively complex as it involved multiple paths as well as two moderators. Thus, PROCESS macro provides a fairly simple way to analyze relatively complex models using bootstrapping (Pezzullo, 2013). Furthermore, It is assumed that not all moderating effects are significant across all ranges of the moderator variable (continuous). PROCESS macro offers the method of visualizing and probing the interaction effect by generating a series of plots that can be later assembled into a graph (Dawson, 2014). The graph depicts the conditional effect of X (focal predictor) on Y (dependent variable), as a function of M (moderator variable). The moderating effects are probed using the regions of significance in accordance to the Johnson-Neyman technique (Hayes, 2018).

In order to confirm whether a variable has a moderating effect on the relationship between an independent variable and a dependent variable, the inclusion of the interaction (i.e., moderator variable) should increase the model's explanatory power than without. The following two steps are recommended when testing for moderated effects using PROCESS (Hayes, 2017):

I. The first step (**Model 1**) of the hierarchical moderated regression analysis involves predicting the outcome variable *Y* from both the predictor variable *X* and the moderator variable *Z*. Both effects as well as the explanatory power of the model (R^2) should be significant (p<.05) in order to proceed with moderation analysis.

II. In the second step (**Model 2**) the interaction/moderation effect (*X*Z*) is added to the previous model. Moderation occurs in Model 2 when there is a significant incremental change on the explanatory power of the model (ΔR^2 = p<.05).

In line with the research objectives the moderated regression analysis will be two-fold, where by the first scenario involves analysing the simple moderating effect (See Figure 5.8) of information security (*W*) which is the primary moderator on the relationship between marketing-related mobile activity (*X*) and adoption (*Y*).

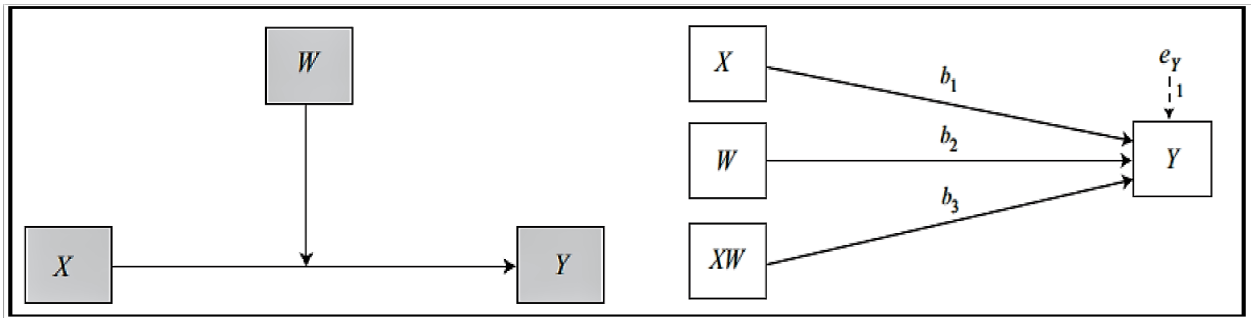


Figure 5.8: A Simple Moderation Model Depicted in the Form of a Conceptual Diagram (left) and a Statistical Diagram (right).

Source: Adapted from Hayes (2017)

The statistical model as depicted in Figure 5.8 which also explains the first scenario takes the form of a linear equation (Hayes, 2012; Jaccard & Turrisi, 2003) in which adoption (*Y*) is estimated as a weighted function of marketing-related mobile activity (*X*), information security (*M*), and, most typically, the product of *X* and *M* (*XM*), as in Equation 1:

$$Y = a + b_1 X + b_2 M + b_3 XM + e \quad (1)$$

The proposition for the second scenario is that the interaction between marketing-related mobile activity and information security on adoption further varies with gender (*Z*). This simply means that the effect of *X* on *Y* can also depend multiplicatively on *M* and *Z*, a situation that could be called moderated moderation or three-way interaction (Hayes, 2012). This scenario is represented in conceptual and statistical form depicted in Figure 5.9, where *XMZ* is the product of *X*,*M*, and *Z* . This product allows the moderation of *X*'s effect on *Y* by *M* to depend on *Z* as depicted in Equation 2:

$$Y = a + b_1 X + b_2 M + b_3 Z + b_4 XM + b_5 XZ + b_6 MZ + b_7 XMZ + e \quad (2)$$

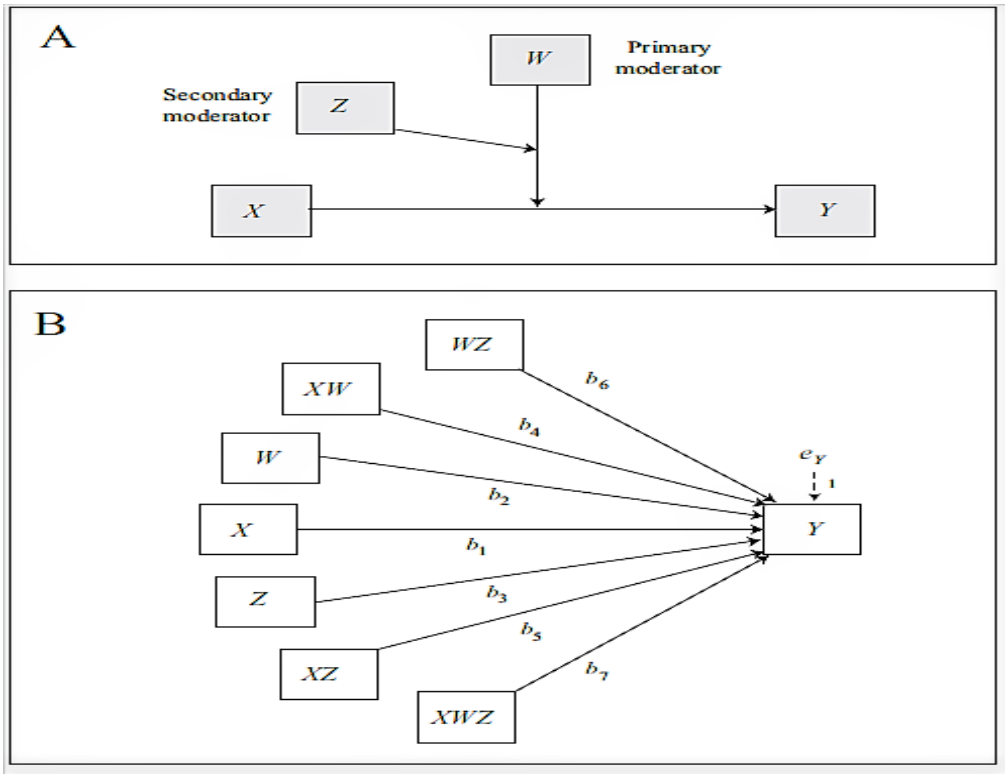


Figure 5.9: A moderated moderation model depicted in the form of a conceptual diagram (Panel A) and a statistical diagram (panel B).

Source: Adapted from Hayes (2017)

A moderation effect as espoused by Frazier, Tix, and Barron (2004) could be: (a) Enhancing, where increasing the moderator would increase the effect of the predictor (IV) on the outcome (DV); (b) Buffering, where increasing the moderator would decrease the effect of the predictor on the outcome; or (c) Antagonistic, where increasing the moderator would reverse the effect of the predictor on the outcome. In the following sections, results of the moderation analyses are presented in detail.

5.8.1. Test of Moderation Effect of Perceived Verification on the Relationship between Marketing Related Mobile Activity and Adoption

To successfully test whether the explanatory power of the relationship between marketing-related mobile activity and adoption of mobile marketing transactions is affected by the presence of

perceived information security variable of verification, a moderated hierarchical regression analysis was carried out. Owing to the fact that marketing related mobile activity constitutes of three different constructs - providing information, accessing information, and sharing content - the moderation effect of perceived verification on adoption was analysed separately for each variable (see Table 5.15) in order to deduct some well-informed marketing implications from the study. Sections 5.8.1.1 to 5.8.1.3 outline in detail results of the tests for moderation effects of perceived verification on the relationship between marketing related mobile activity variables and adoption.

Table 5.15: Moderation Test Results for Perceived Verification on Adoption

Description of test	Regression Model	*Adjusted R^2*	R^2 Change	*β*	*F*	*Df*	*p-value*	*Conclusion*
Moderation effect of perceived verification on the relationship between providing information and adoption	*Model 1* Providing information, Verification	.538	.538		283.503	3	.000	Proceed with moderation test
	Model 2 Providing information, Verification, Providing information * Verification	.564	.026	.123	41.758	1	.000	Moderation supported
Moderation effect of perceived verification on the relationship between sharing content and adoption	*Model 1* Sharing content, Verification	.210	.210		64.982	3	.000	Proceed with moderation test
	Model 2 Sharing content, Verification, Sharing content * Verification	.213	.013	.0840	12.109	1	.005	Moderation supported
Moderation effect of perceived verification on the relationship between accessing content and adoption	*Model 1* Accessing content, Verification	.476	.476		221.531	3	.000	Proceed with moderation test
	Model 2 Accessing content, Verification, Accessing content * Verification	.510	.034	.142	47.435	1	.000	Moderation supported

Note: N= 735; Independent variables= Providing information, Sharing content and Accessing content; Moderator variable=Verification; Dependent variable=Adoption of mobile marketing transactions; p<.05

* The change statistics are not very useful for the first step because it is comparing model 1 with an empty model (i.e., no predictors) which is going to be the same as the R^2

5.8.1.1. Hypothesis 4a: Perceived Verification Moderates the Relationship between Providing Information and Adoption

In Model 1 of the moderated hierarchal regression analysis as depicted in Table 5.15, the results show that providing information and perceived verification contributed significantly to the regression model, F (3,731) = 283.503, p< .05 and accounted for 53.8 per cent (R^2 = .538) of the variation in adoption. The results from Model 1 are statistically significant and thus satisfy the conditions of proceeding with the moderation analysis as recommended by Hayes (2017). Introducing the interaction term (Providing information*Verification) on the second stage to regression Model 1 explained an additional 2.6 per cent of the variation in adoption and this change in R^2 was significant, F (1,731) = 41.758, p < .05. Furthermore, as depicted in Table 5.15, the standardised coefficient (beta) value for the interaction effect was positive (β =.123) and significant (p<.05), and hence supporting Hypothesis $\mathbf{H_{4a}}$. These results show that perceived verification significantly moderated providing information's effect on adoption. Consequently, a conclusion can be advanced that perceived verification posits a significant moderating effect on the relationship between providing information and adoption of mobile marketing transactions.

Considering that a significant moderating effect of perceived verification on the relationship between providing information and adoption was established, it became apparent to probe the direction of the effect caused by the moderator through conducting simple slope tests. Simple slope tests are used to evaluate whether the relationship (slope) between the independent variable and dependent variable is significant at low, mean, and high levels of the moderator. Dawson (2014) emphasizes that the direction of a moderation effect is not easy to define through examining the moderated regression coefficients alone and easier interpretation usually requires plotting simple slopes which can be interpreted visually. Such slopes show the conditional effect of the independent variable (X) on the dependent variable (Y) for each level of the moderator variable (Z). This according to Hayes (2017) is usually done by calculating predicted values of Y under different conditions (high, mean, and low values of the X, and high, mean, and low values of Z) and showing the predicted relationship (simple slopes) between the X and Y at these different levels of Z. Figure 5.10 provides the simple slopes of the conditional effects of providing information on adoption at three different levels of perceived verification.

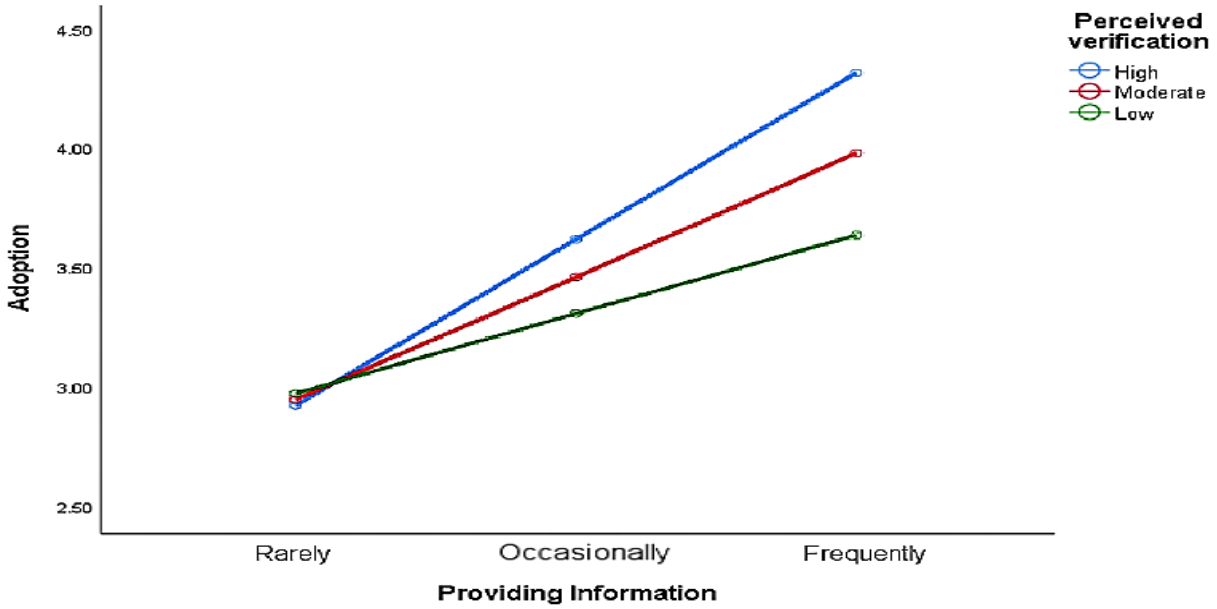


Figure 5.10: Effect of Providing Information on Adoption, Moderated by Perceived Verification.

An observation of the interaction plots presented in Figure 5.10 shows an enhancing moderation effect, where increasing online verification mechanisms by retailers would increase the effect of marketing-related mobile activity of providing information on adoption of mobile marketing transactions. Thus, depending on the rate at which consumers provided information online, those who perceived retailers' websites as having high verification mechanisms were more likely to adopt mobile marketing than consumers who perceived verification as being moderate or low. This is evident by the slopes of providing information on adoption, which are slightly steeper for consumers who had higher and moderate perceptions regarding online verification, as opposed to the slope for those who had low perceptions.

5.8.1.2. Hypothesis 4_b: Perceived Verification Moderates the Relationship between Sharing Content and Adoption

Moderated hierarchical regression analysis was used to assess the moderating role of perceived verification on the relationship between sharing content and adoption. In Model 1 of the moderated regression model, sharing content and perceived verification explained a significant amount of variance in adoption, $R^2 = .210$, $F(3,731) = 64.982$, $p < .05$ as shown earlier in Table 5.15. In Model 2, the interaction term (Sharing content*Adoption) was added to regression Model 1 and the effect was significant, $R^2 = .211$, $F(1,731) = 12.109$, $\beta = 0.840$, $p < .05$. The moderation

effect explains about 1.3 per cent (ΔR^2 = .013) of the variance in strength of adoption, as calculated from the difference in R^2 for the model that includes the interaction term (Model 2, R^2 = .211) compared to the model that excludes it (Model 1, R^2 = .210). This incremental variance in adoption of mobile marketing transactions (ΔR^2 = .013) is within the recommended range of .01–.03 for non-experimental studies (Chiaburu & Byrne, 2009; Cohen, 1988). These results signal that perceived verification significantly moderated sharing content's effect on adoption of mobile marketing transactions and as such warrant the acceptance of hypothesis **H_{4b}**. To illustrate the direction of the moderating effect, Figure 5.11 provides a visual illustration of the interaction slopes for the conditional effects of sharing content on adoption at three different levels of perceived verification.

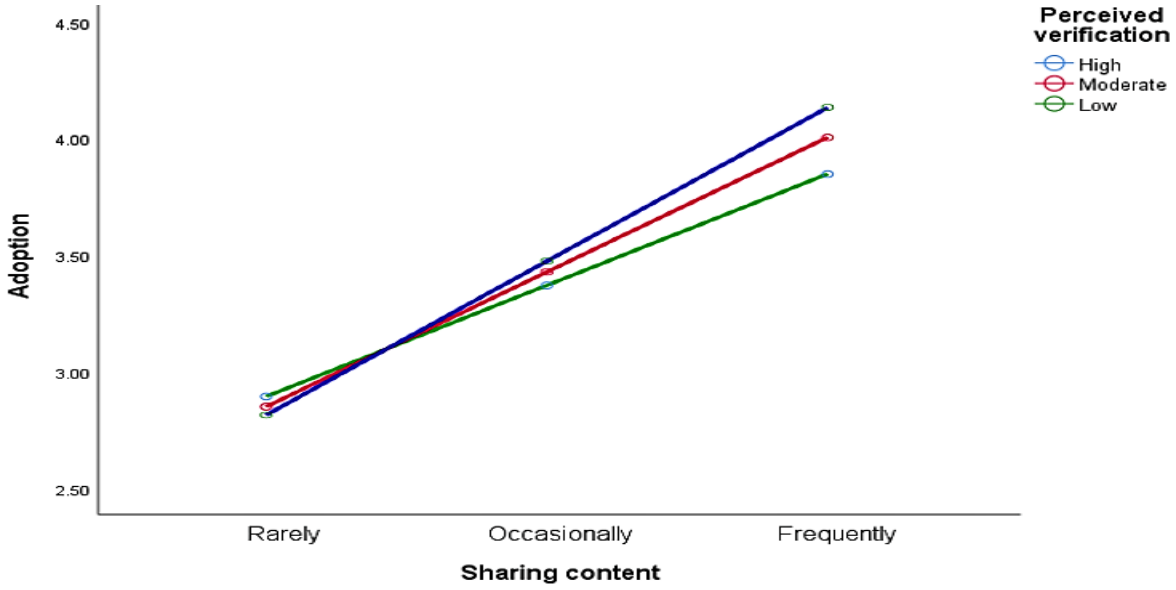


Figure 5.11: Effect of Sharing Content on Adoption, Moderated by Perceived Verification

Studying the interaction slopes in Figure 5.11 highlights differences in the mean adoption among respondents who rarely shared information online versus those who occasionally and frequently shared information online, but this effect changed depending on the level of respondents' perceptions regarding online verification. Respondents who frequently engaged in the activity of sharing content and perceived it as being safe through high verification mechanisms recorded more chances of adopting mobile marketing transactions as compared to those who occasionally and rarely shared content and perceived verification to being moderate or low. Hence, it is evident that higher perceptions regarding verification as depicted in Figure 5.11 had an enhancing

moderating effect on the relationship between sharing content and adoption. However, as shown by the slopes which are not much wide apart, the effect size is relatively weaker and hence clearly depicting that in sharing content activity which normally occurs among social networks perceived verification has lesser moderating effect.

5.8.1.3. Hypothesis 4_C: Perceived Verification Moderates the Relationship between Accessing Content and Adoption

To test the hypothesis that perceived verification moderates the relationship between marketing-related mobile activity of accessing content and adoption of mobile marketing transactions, a moderated hierarchical regression analyses was conducted. Studying the output in Table 5.15, the variables (accessing content and verification) in Model 1 of the moderated hierarchal regression accounted for a significant amount of variance in adoption R^2 = .476, $F(3,731)$ = 221.531, p < .05. Introducing the interaction term (Accessing content*Verification) in Model 2 to regression Model 1 yielded an additional 3.4 per cent (ΔR^2 = .034) of the variation in adoption and this change in R^2 was significant, F (1,731) = 47.435, p < .05. In addition, as highlighted in Table 5.15, the standardised coefficient (beta) value for the interaction effect was positive (β =.142) and significant (p<.05), and hence supporting hypothesis **H_{4c}**. Therefore, a deduction can be advanced that perceived verification posits a significant moderating effect on the relationship between accessing content and adoption of mobile marketing transactions.

As demonstrated earlier in the test for hypotheses **H_{4a}** and **H_{4b}** if a significant moderation effect is established, a further probe should be conducted to determine the precise direction of this effect to give proper meaning and ensure easier interpretation (Dawson, 2014). As such, Figure 5.12 presents the interaction slopes for the conditional effect of accessing content on adoption, moderated by perceived verification.

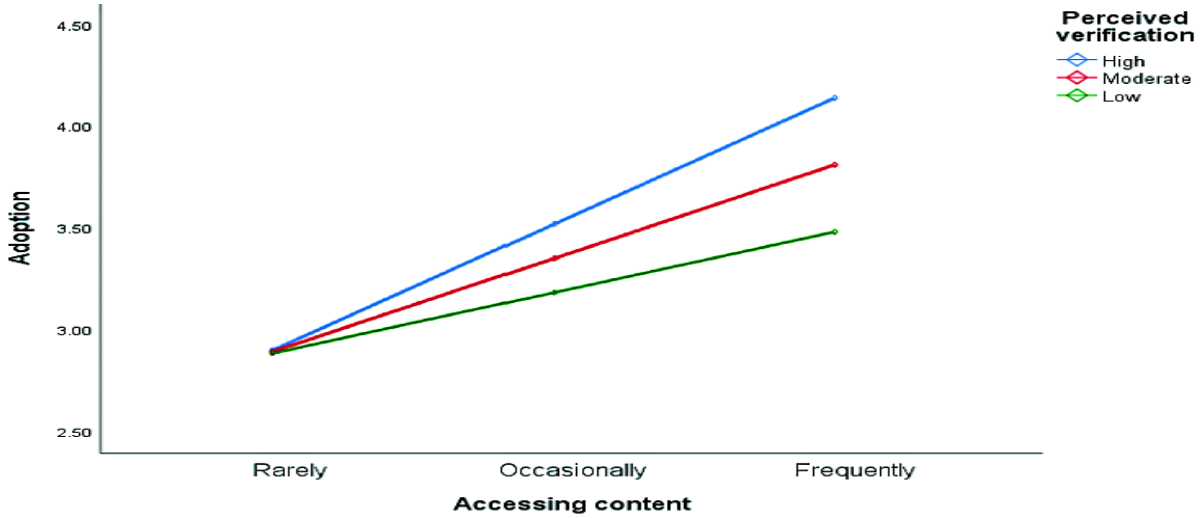


Figure 5.12: Effect of Accessing Content on Adoption, Moderated by Perceived Verification

The interaction slopes in Figure 5.12 confirmed a positive moderation effect of perceived verification on the relationship between accessing content and adoption as evidenced by the upward trajectory of all the three slopes depicting the estimated marginal mean adoption at different levels of verification. The slopes further depict that the interaction effect between accessing content and perceived verification on adoption for respondents who rarely accessed content was modest irrespective of whether they perceived online verification as low, moderate, or high. The effect was, however, larger for respondents who occasionally accessed content and perceived verification as moderate and greatest for respondents who revealed frequently accessing content online, and perceived online verification as high. Thus, Figure 5.12 demonstrates that the direction of the accessing content–adoption relationship changes depending on the level of verification.

5.8.2. Test of Moderation Effect of Perceived Authentication on the Relationship between Marketing Related Mobile Activity and Adoption

To successfully test whether the explanatory power of the relationship between marketing-related mobile activity and adoption of mobile marketing transactions is affected by the presence of perceived information security variable of authentication, a moderated hierarchical regression analysis was carried out (see Table 5.16). Sections 5.8.2.1 to 5.8.2.3 outline results of the tests for moderation effects of perceived authentication on the relationship between each antecedent of marketing-related mobile activity and adoption of mobile marketing transactions.

Table 5.16: Moderation Test Results for Perceived Authentication on Adoption

Description of test	Regression Model	*Adjusted R^2*	R^2 Change	*β*	*F*	*df*	*p-value*	*Conclusion*
Moderation effect of perceived authentication on the relationship between providing information and adoption	*Model 1* Providing information, Authentication	.419	.419		176.333	3	.000	Proceed with moderation test
	Model 2 Providing information, Authentication, Providing information * Authentication	.419	.000	.007	.131	1	.717	Moderation failed
Moderation effect of perceived authentication on the relationship between sharing content and adoption	*Model 1* Sharing content, Authentication	.060	.060		1.603	3	.120	Moderation test failed in step 1
Moderation effect of perceived authentication on the relationship between accessing content and adoption	*Model 1* Accessing content, Authentication	.397	.397		160.370	3	.000	Proceed with moderation test
	Model 2 Accessing content, Verification, Accessing content * Verification	.397	.000	.006	.094	1	.759	Moderation failed

Note: N= 735; Independent variables= Providing information, Sharing content and Accessing content; Moderator variable=Authentication; Dependent variable=Adoption of mobile marketing transactions; p<.05

* The change statistics are not very useful for the first step because it is comparing model 1 with an empty model (i.e., no predictors) which is going to be the same as the R^2

5.8.2.1. Hypothesis 5_a: Perceived Authentication Moderates the Relationship between Providing Information and Adoption

In Model 1 of the moderated hierarchal regression analysis as depicted in Table 5.16, the results show that providing information and perceived authentication contributed significantly to the regression model, F (3,731) = 176.333, p< .05 and accounted for 41.9 per cent (R^2 = .419) of the explanatory power of the model. The results from Model 1 are statistically significant and thus satisfy the conditions of proceeding with the moderation analysis. Adding the interaction term (Providing information*Authentication) on Model 2 of the moderated hierarchal regression analysis failed to elicit a significant increase to the explanatory power of Model 2, F (1,731) = .1313, p > .05. Furthermore, as depicted in Table 5.16, the standardised coefficient (beta) value for the moderation effect was very low and insignificant, β =.007, p>.05. The results, hence, do not support Hypothesis **H_{5a}** and an inference can be advanced that perceived authentication does not have a significant moderating effect on the relationship between providing information and adoption of mobile marketing transaction.

Dawson (2014) and Hayes (2017) point out that if the moderated hierarchal regression coefficients fail to give evidence of significant interaction between a predictor variable and a moderator variable, it renders plotting simple slopes inappropriate as they would not be any effects to probe. The above notion is further reinforced by Robinson, Tomek, and Schumacker (2013) who argue that the test for the difference between the simple slopes should be utilised only when researchers are interested in probing for significant moderation effects. Consistent with these authors, the researcher did not consider conducting simple slope tests for non-moderated relationships.

5.8.2.2. Hypothesis 5_b: Perceived Authentication Moderates the Relationship between Sharing Content and Adoption

Moderated hierarchical regression analysis was used to assess the moderating role of perceived authentication on the relationship between sharing content and adoption. In Model 1 as depicted earlier in Table 5.16, sharing content and perceived authentication explained a non-significant amount of variance in adoption, R^2 = .060, F(3,731) = 1.603, p > .05. The non-significant result in Model 1 implies that moderation test failed in the first stage and as such the test could not proceed to Model 2. These results signal that perceived authentication does not moderate the relationship

between sharing content and adoption of mobile marketing transactions, and as such Hypothesis **H_{5b}** is rejected.

5.8.2.3. Hypothesis 5_C: Perceived Authentication Moderates the Relationship between Accessing Content and Adoption

To test the hypothesis that perceived authentication moderates the relationship between accessing content and adoption of mobile marketing transactions, a moderated hierarchical regression analyses was conducted. As can be seen in Table 5.16, the variables (accessing content and authentication) in Model 1 of the moderated hierarchal regression accounted for a significant amount of variance in adoption R^2 = .396, $F(3,731)=160.370$, $p<.05$. However, introducing the interaction term (Accessing content*Authentication) on the second stage (Model 2) to regression Model 1 yielded an insignificant change to the explanatory power of the model (ΔR^2 = .000, F (1,731) = .093, β =.006, $p > .05$). The results, therefore, do not support Hypothesis **H_{5c}** and a conclusion can be advanced that perceived authentication does not moderate the relationship between accessing content and adoption of mobile marketing transactions.

5.8.3. Test of Moderation Effect of Perceived Protection on the Relationship between Marketing Related Mobile Activity and Adoption

To effectively test whether the explanatory power of the relationship between marketing-related mobile activity and adoption of mobile marketing transactions is affected by the presence of perceived information security variable of protection, a moderated hierarchical regression analysis was performed (see Table 5.17). Sections 5.8.3.1 to 5.8.3.3 outline results of the tests for moderation effects of perceived protection on the relationship between each marketing-related mobile activity construct and adoption of mobile marketing transactions.

Table 5.17: Moderation Test Results for Perceived Protection on Adoption

Description of test	Regression Model	*Adjusted R^2*	R^2 Change	*β*	*F*	*df*	*p-value*	*Conclusion*
Moderation effect of perceived protection on the relationship between providing information and adoption	*Model 1* Providing information, Protection	.538	.538		283.503	3	.000	Proceed with moderation test
	Model 2 Providing information, Protection, Providing information * Protection	.564	.026	.124	41.785	1	.000	Moderation supported
Moderation effect of perceived protection on the relationship between sharing content and adoption	*Model 1* Sharing content, Protection	.338	.338		124.603	3	.000	Proceed with moderation test
	Model 2 Sharing content, Protection, Sharing content * Protection	.348	.010	.071	10.498	1	.001	Moderation supported
Moderation effect of perceived protection on the relationship between accessing content and adoption	*Model 1* Accessing content, Protection	.528	.528		272.905	3	.000	Proceed with moderation test
	Model 2 Accessing content, Protection, Accessing content * Protection	.556	.028	.130	42.699	1	.000	Moderation supported

Note: N= 735; Independent variables= Providing information, Sharing content and Accessing content; Moderator variable=Protection; Dependent variable=Adoption of mobile marketing transactions; p<.05

* The change statistics are not very useful for the first step because it is comparing model 1 with an empty model (i.e., no predictors) which is going to be the same as the R^2

5.8.3.1. Hypothesis 6_a: Perceived Protection Moderates the Relationship between Providing Information and Adoption

Moderated hierarchical regression analysis was used to assess the moderating role of perceived protection on the relationship between providing information and adoption. In Model 1, providing information and perceived protection explained a significant amount of variance in adoption, R^2 = .538, $F(3,731) = 283.503$, $p < .05$ as depicted earlier in Table 5.17. In the second regression model, the moderation term (Providing information*Protection) was added to regression Model 1 and the effect was significant, R^2 = .564, $F(1,731) = 41.785$, $\beta = 0.124$, $p < .05$. The moderation effect explains about 2.6 per cent (ΔR^2 = .026) of the variance in strength of adoption, as calculated from the difference in the explanatory power for the model that includes the interaction term (Model 2, R^2 = .564) compared to the model that excludes it (Model 1, R^2 = .538). These results show that perceived verification significantly moderates providing information's effect on adoption of mobile marketing transactions and as such warrant the acceptance of Hypothesis **H_{6a}**.

Figure 5.13 provides a visual illustration aimed at demonstrating the direction of the interaction slopes for the conditional effect of providing information on adoption at three different levels of perceived protection.

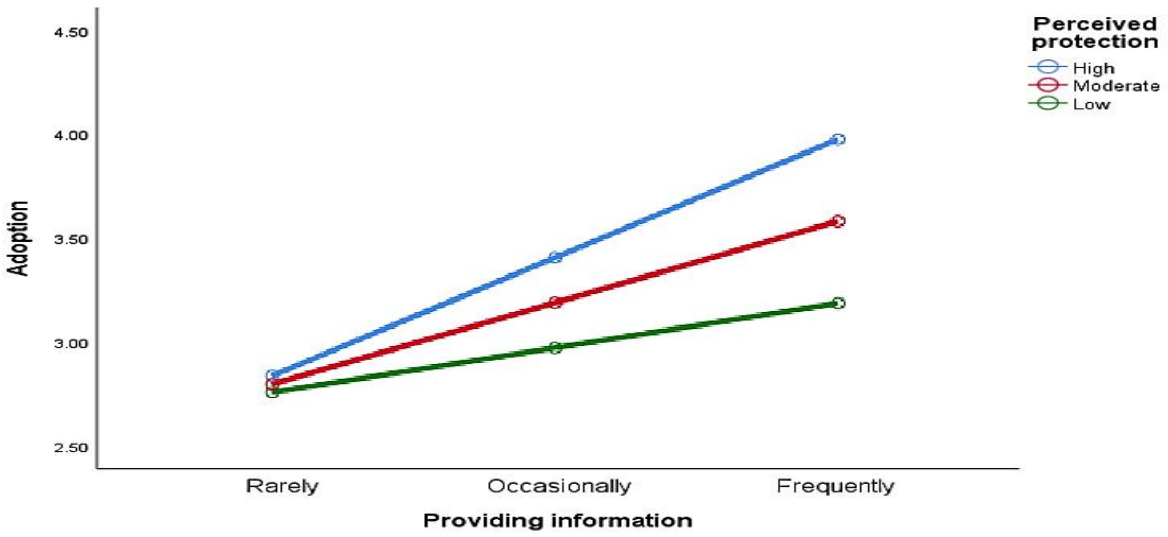


Figure 5.13: Effect of Providing Information on Adoption, Moderated by Perceived Protection

An observation of the interaction plots presented in Figure 5.13 shows an enhancing moderation effect, where increasing online protection mechanisms by retailers would increase the effect of the marketing-related mobile activity of providing information on adoption of mobile marketing transactions. Thus, depending on the rate at which respondents provided information online, those respondents who perceived retailers' websites as having high protection mechanisms were more likely to adopt mobile marketing than consumers who perceived online protection as being moderate or low. This is evidenced by the slopes depicting mean adoption which are relatively steeper for respondents who had high and moderate perceptions regarding online protection as opposed to the slope depicting mean adoption for respondents who exhibited low perceptions regarding online protection.

5.8.3.2. Hypothesis 6_b: Perceived Protection Moderates the Relationship between Sharing Content and Adoption

To test the hypothesis that perceived protection moderates the relationship between marketing-related mobile activity of sharing content and adoption of mobile marketing transactions, a moderated hierarchical regression analyses was conducted. As can be seen in Table 5.17, the variables (sharing content and protection) in model 1 of the moderated hierarchal regression accounted for a significant amount of variance in adoption $R^2 = .338$, $F(3,731) = 124.603$, $p < .05$. Introducing the interaction term (Sharing content*Protection) on the second stage (Model 2) to regression Model 1 yielded an additional 1.0 per cent ($\Delta R^2 = .010$) of the variation in adoption and this change in R^2 was significant, $F(1,731) = 10.498$, $p < .05$. In addition, as highlighted in Table 5.17, the standardised coefficient (beta) value for the interaction effect was positive ($\beta = .071$) and significant ($p<.05$), and hence further indicating that perceived protection was a significant moderator of the effect of sharing content on adoption. Consequently, Hypothesis $\mathbf{H_{6b}}$ is accepted and a conclusion can, therefore, be advanced that perceived protection posits a significant moderating effect on the relationship between sharing content and adoption of mobile marketing transactions. Figure 5.14 illustrates the direction of the interaction slopes for the conditional effect of providing information on adoption at three different levels of perceived protection.

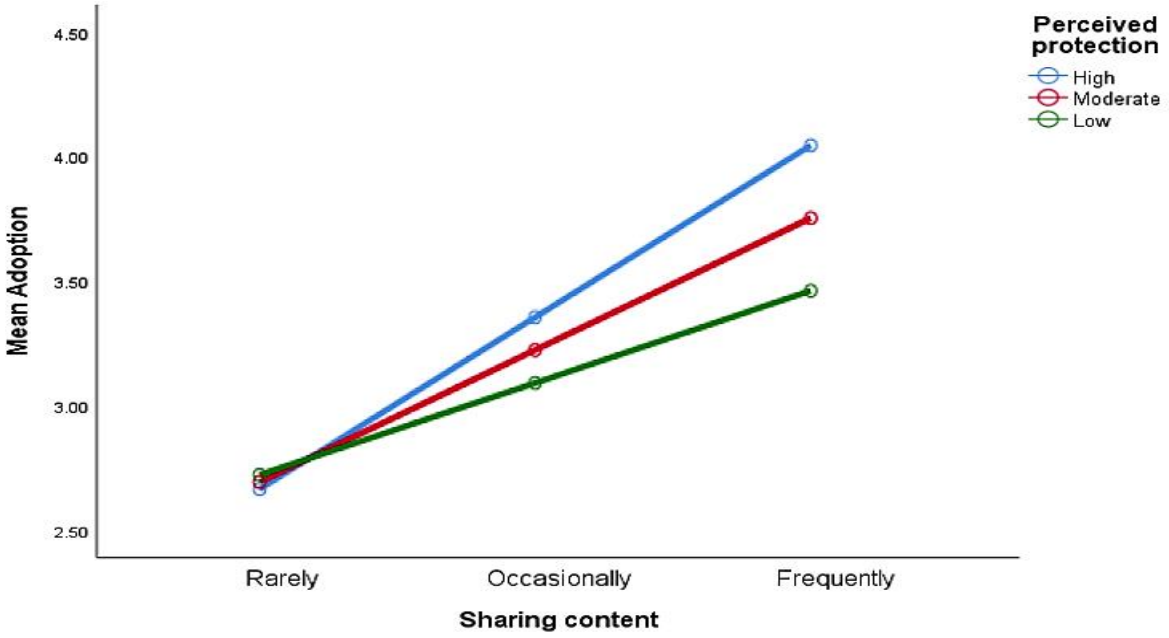


Figure 5.14: Effect of Sharing Content on Adoption, Moderated by Perceived Protection

The interaction slopes in Figure 5.14 show that there was an enhancing moderation effect of perceived protection on the relationship between sharing content and adoption as evident by the upward trajectory of all the three slopes depicting the estimated marginal mean adoption at low, moderate, and high levels of perceived protection. The slopes further depict that the interaction effect between sharing content and perceived protection on adoption for respondents who rarely shared content was modest, irrespective of whether they perceived online verification as low, moderate, or high. The effect was, however, relatively larger for respondents who shared content occasionally and perceived online protection as moderate, whilst greatest for respondents who frequently shared content online and perceived online protection mechanisms as high. As such, Figure 5.14 demonstrates that the direction of the sharing content–adoption relationship changed depending on the level of respondents' perceptions towards online protection.

5.8.3.3. Hypothesis 6_c: Perceived Protection Moderates the Relationship between Accessing Content and Adoption

Moderated hierarchical regression analysis was used to assess the moderating role of perceived protection on the relationship between accessing content and adoption. In Model 1, accessing content and perceived protection explained a significant amount of variance in adoption, R^2 =

.528, $F(3,731) = 272.905$, $p < .05$ as shown earlier in Table 5.17. In the second regression model (Model 2), the interaction term (Accessing content*Protection) was added to regression Model 1 and the effect was significant, $R^2 = .556$, $F(1,731) = 42.699$, $\beta = 0.130$, $p < .05$. The moderation effect explains about 2.8 per cent ($\Delta R^2 = .028$) of the variance in strength of adoption, as calculated from the difference in R^2 for the model that includes the interaction term (Model 2, $R^2 = .556$) compared to the model that excludes it (Model 1, $R^2 = .528$). These results signal that perceived protection significantly moderates accessing content's effect on adoption of mobile marketing transactions and as such warrant the acceptance of Hypothesis **H_{6c}**. To illustrate the direction of the moderating effect, Figure 5.15 shows the interaction slopes for the conditional effect of accessing content on adoption at three different levels of perceived protection.

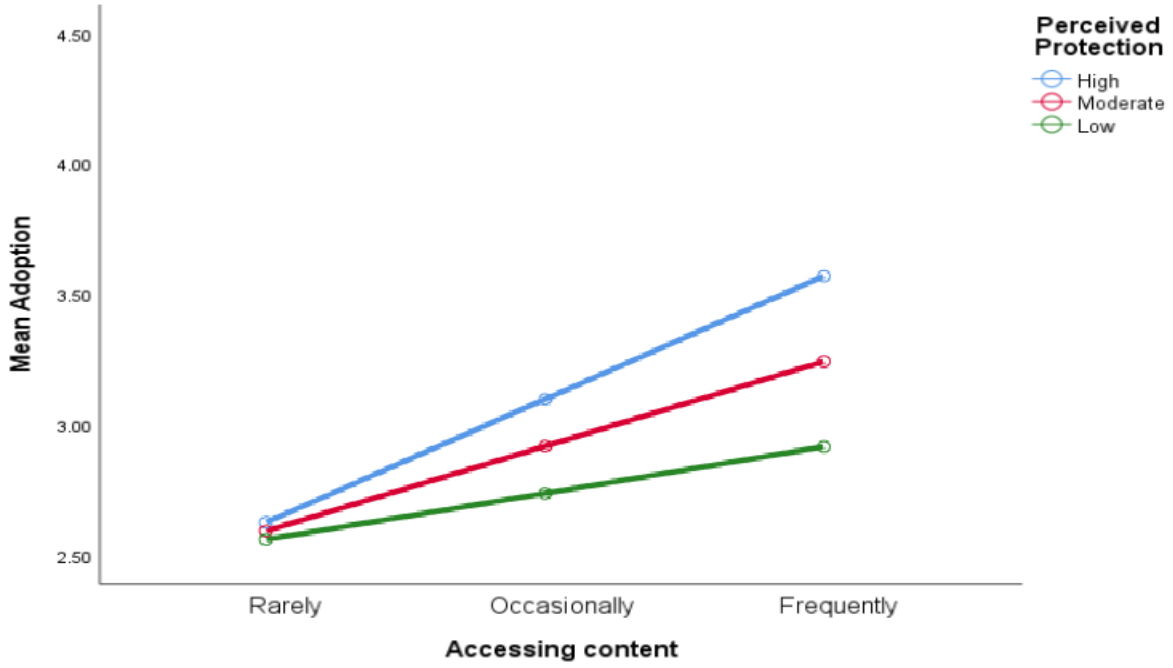


Figure 5.15: Effect of Accessing Content on Adoption, Moderated by Perceived Protection

Studying the interaction slopes in Figure 5.15 highlights differences in the mean adoption among respondents who rarely accessed content online versus those who occasionally and frequently accessed content online. Furthermore, the slopes reveal that the effect of the marketing related mobile activity of accessing content varied depending on the level of respondents' perceptions regarding online protection. Thus, respondents who frequently engaged in the activity of accessing content online and perceived it as being secure through high protection mechanisms recorded much chances of adopting mobile marketing transactions as compared to those who

occasionally and rarely accessed content online and perceived protection as being moderate or low. Hence, perceived protection as depicted in Figure 5.15 by the upward trend of the slopes had an enhancing moderating effect on the relationship between accessing content and adoption of mobile marketing transactions.

5.8.4. Test of Gender Variation on the Moderation Effect of Perceived Verification on the Relationship between Marketing Related Mobile Activity and Adoption

To successfully test whether the explanatory power regarding the moderating effect of perceived verification on the relationship between marketing-related mobile activity and adoption of mobile marketing transaction varied with gender a three-way moderated hierarchical regression analysis was performed (see Table 5.18). Seeing that marketing-related mobile activity is constituted of three different variables - providing information, accessing information, and sharing content - the moderation effect of perceived verification and gender on adoption was analysed separately for each variable and the result are presented in subsequent Sections 5.8.4.1 to 5.8.4.3, respectively.

Table 5.18: Moderation Test Results for Perceived Verification and Gender on Adoption

Description of test	Regression Model	*Adjusted R^2*	R^2 Change	*β*	*F*	*df*	*p-value*	*Conclusion*
Moderation effect of perceived verification on the relationship between providing information and adoption varies with gender	*Model 1* PI, Verification, Gender	.501	.501		104.212	7	.000	Proceed with moderation test
	Model 2 PI, Verification, Gender PI * Verification*Gender	.501	.000	-.016	.160	1	.690	Moderation failed
Moderation effect of perceived verification on the relationship between sharing content and adoption varies with gender	*Model 1* SC, Verification, Gender	.217	.217		28.734	7	.000	Proceed with moderation test
	Model 2 SC, Verification, Gender SC * Verification*Gender	.218	.001	-.112	5.279	1	.222	Moderation failed
Moderation effect of perceived verification on the relationship between accessing content and adoption varies with gender	*Model 1* AC, Verification, Gender	.483	.483		96.893	7	.000	Proceed with moderation test
	Model 2 AC, Verification, Gender AC * Verification*Gender	.483	.000	-.009	.045	1	.832	Moderation failed

Note: N= 735; Independent variables= Providing information (PI), Sharing content (SC) and Accessing content (AC); Moderator variable=Verification; Dependent variable=Adoption of mobile marketing transactions; p<.05

* The change statistics are not very useful for the first step because it is comparing model 1 with an empty model (i.e., no predictors) which is going to be the same as the R^2

5.8.4.1. Hypothesis 7_a: The Moderating Effect of Perceived Verification on the Relationship between Providing Information and Adoption Varies with Gender

To test the hypothesis that the moderating effect of perceived verification on the relationship between providing information and adoption varies with gender, a moderated hierarchical regression analyses was conducted. As illustrated in Table 5.18, the variables (providing information, authentication, and gender) in Model 1 of the moderated hierarchal regression accounted for a significant amount of variance in adoption R^2 = .501, $F(7,731)=104.212$, $p<.05$. However, incorporating the interaction term (Providing information*Verification*Gender) on the second stage (Model 2) to regression Model 1 yielded an insignificant change to the explanatory power of the model (ΔR^2 = .000, F (1,731) = .160, β =-.016, p > .05). The results, therefore, do not support Hypothesis **H_{7a}** and the conclusion that the moderating effect of perceived verification on the relationship between providing information and adoption do not vary with gender can be advanced.

5.8.4.2. Hypothesis 7_b: The Moderating Effect of Perceived Verification on the Relationship between Sharing Content and Adoption Varies with Gender

In Model 1 of the moderated hierarchal regression analysis conducted to test Hypothesis **H_{7b}** as depicted in Table 5.18, the results show that sharing content, verification, and gender contributed significantly to the regression Model 1, F (7,731) = 28.734, p< .05 and accounted for 21.7 per cent (R^2 = .217) of the explanatory power of the model. The results from Model 1 are statistically significant and thus satisfy the conditions of proceeding with the moderation analysis. Introducing the interaction term (Verification*Sharing content*Gender) on Model 2 of the moderated hierarchal regression analysis failed to elicit a significant increase to the explanatory power of Model 2, ΔR^2 = .000, F (1,731) = 5.279, p > .05. Furthermore, as depicted in Table 5.18, the standardised coefficient (beta) value for the moderation effect was negative and insignificant, β =-.112, p>.05. The results hence do not support Hypothesis **H_{7b}** and warrant rejection of the proposition that the moderating effect of perceived verification on the relationship between sharing content and adoption varies with gender.

5.8.4.3. Hypothesis 7_c: The Moderating Effect of Perceived Verification on the Relationship between Accessing Content and Adoption Varies with Gender

A moderated hierarchical regression analysis was performed to test whether the moderating effect of perceived verification on the relationship between accessing content and adoption varies with gender. The independent variables (accessing content, verification, and gender) in Model 1 accounted for 48.3 per cent of the variance on adoption and was statistically significant, F (7,731) = 96.893, p< .05. Model 2 of the moderated hierarchical regression analysis incorporated to Model 1 a three-way interaction between Accessing content, Verification, and Gender and the effect was found to be statistically insignificant F (1,731) = .045, β =-.009, p> .05, leaving the overall R^2 practically unchanged when compared to Model 1, ΔR^2 = .000. These results imply that the moderating effect of perceived verification on the relationship between accessing content and adoption do not vary with gender, thus $\mathbf{H_{7c}}$ is rejected.

5.8.5. Test of Gender Variation on the Moderation effect of Perceived Authentication on the Relationship between Marketing Related Mobile Activity and Adoption

To effectively test whether the explanatory power regarding the moderating effect of perceived authentication on the relationship between marketing-related mobile activity and adoption of mobile marketing transaction varied with gender a three-way moderated hierarchical regression analysis was performed (see Table 5.19). The moderation effect of perceived verification and gender on the relationship between marketing-related mobile activity and adoption was analysed separately for each marketing-related mobile activity construct and the result are presented in Sections 5.8.5.1 to 5.8.5.3.

Table 5.19: Moderation Test Results for Perceived Authentication and Gender on Adoption

Description of test	Regression Model	*Adjusted R^2*	R^2 Change	*B*	*F*	*df*	*p-value*	*Conclusion*
Moderation effect of perceived authentication on the relationship between providing information and adoption varies with gender	*Model 1* PI, Authentication, Gender	.427	.427		77.348	7	.000	Proceed with moderation test
	Model 2 PI, Authentication, Gender PI * Authentication*Gender	.428	.001	-.075	3.511	1	.061	Moderation failed
Moderation effect of perceived authentication on the relationship between sharing content and adoption varies with gender	*Model 1* SC, Authentication, Gender	.012	.012		1.214	7	.292	Moderation failed in step 1
Moderation effect of perceived authentication on the relationship between accessing content and adoption varies with gender	*Model 1* AC, Authentication, Gender	.405	.405		70.703	7	.000	Proceed with moderation
	Model 2 AC, Verification, Gender AC * Verification* Gender	.408	.003	-.082	3.781	1	.072	Moderation failed

Note: N= 735; Independent variables= Providing information (PI), Sharing content (SC) and Accessing content (AC); Moderator variable=Authentication; Dependent variable=Adoption of mobile marketing transactions; p<.05

* The change statistics are not very useful for the first step because it is comparing model 1 with an empty model (i.e., no predictors) which is going to be the same as the R^2

5.8.5.1. Hypothesis 8_a: The Moderating Effect of Perceived Authentication on the Relationship between Providing Information and Adoption Varies with Gender

In Model 1 of the moderated hierarchal regression analysis conducted to test Hypothesis **H_{8a}** as depicted in Table 5.19, the outcome shows that providing information, authentication, and gender contributed significantly to the regression Model 1, F (7,731) = 77.348, p< .05 and accounted for 42.7 per cent (R^2 = .427) of the explanatory power of the model. The results from Model 1 are statistically significant and thus satisfied the conditions of proceeding with the moderation analysis. Introducing the interaction term (Providing information*Authentication *Gender) on second stage of the moderated hierarchal regression analysis failed to elicit a significant increase to the explanatory power of Model 2, ΔR^2 = .001, F (1,731) = 3.511, p > .05. Furthermore, the standardised coefficient (beta) value for the interaction effect was negative and insignificant, β =-.075, p>.05. The results hence failed to support Hypothesis **H_{8a}** and warrant rejection of the proposition that the moderating effect of perceived authentication on the relationship between providing information and adoption varies with gender.

5.8.5.2. Hypothesis 8_b: The Moderating Effect of Perceived Authentication on the Relationship between Sharing Content and Adoption Varies with Gender

A moderated hierarchical regression analyses was performed to test whether the moderating effect of perceived authentication on the relationship between sharing content and adoption varied with gender. The independent variables (sharing content, authentication, and gender) in Model 1 accounted for only 1.2 per cent of the variance on adoption and is statistically insignificant, F (7,731) = 1.214, p> .05. The non-significant result in Model 1 implied that the moderation test failed in the first stage and could not proceed to Model 2. These results signal that the moderating effect of perceived authentication on the relationship between sharing content and adoption do not vary with gender and as such Hypothesis **H_{8b}** is rejected.

5.8.5.3. Hypothesis 8_c: The Moderating Effect of Perceived Authentication on the Relationship between Accessing Content and Adoption Varies with Gender

To test the hypothesis that the moderating effect of perceived authentication on the relationship between accessing content and adoption varied with gender a moderated hierarchical regression analyses was conducted. As can be seen in Table 5.19, the variables (accessing content, authentication, and gender) in Model 1 of the moderated hierarchal regression accounted for a significant amount of variance in adoption R^2 = .405, $F(7,731)=70.703$, $p<.05$. Incorporating the interaction term (Accessing content*Authentication*Gender) on the second stage to regression Model 1 yielded an insignificant change to the explanatory power of the model (ΔR^2 = .003, $F(1,731) = 3.781$, β =-.082, $p > .05$). The results, therefore, do not support Hypothesis **H_{8c}** and a conclusion can be put forward that the moderating effect of perceived authentication on the relationship between accessing content and adoption do not vary with gender.

5.8.6. Test of Gender Variation on the Moderation Effect of Perceived Protection on the Relationship between Marketing Related Mobile Activity and Adoption

To successfully test whether the explanatory power relating to the moderating effect of perceived information security variable of protection on the relationship between marketing-related mobile activity and adoption of mobile marketing transactions varied with gender, a three-way moderated hierarchical regression analysis was performed (see Table 5.20). The moderation effect of perceived protection and gender on the relationship between marketing-related mobile activity and adoption was analysed separately for each marketing-related mobile activity construct and the results are presented in Sections 5.8.6.1 to 5.8.6.3.

Table 5.20: Moderation Test Results for Perceived Protection and Gender on Adoption

Description of test	**Regression Model**	***Adjusted R^2***	***R^2* Change**	***β***	***F***	***df***	***p-value***	***Conclusion***
Moderation effect of perceived protection on the relationship between providing information and adoption varies with gender	*Model 1* PI, Protection, Gender	.549	.549		126.320	7	.000	Proceed with moderation test
	Model 2 PI, Protection, Gender PI * Protection * Gender	.563	.014	.197	20.550	1	.010	Moderation supported
Moderation effect of perceived protection on the relationship between sharing content and adoption varies with gender	*Model 1* SC, Protection, Gender	.342	.342		53.917	7	.000	Proceed with moderation test
	Model 2 SC, Protection, Gender SC * Protection * Gender	.344	.002	-.073	2.663	1	.103	Moderation failed
Moderation effect of perceived protection on the relationship between accessing content and adoption varies with gender	*Model 1* AC, Protection, Gender	.539	.539		121.539	7	.000	Proceed with moderation test
	Model 2 AC, Protection, Gender AC * Protection * Gender	.543	.014	.113	15.474	1	.019	Moderation supported

Note: N= 735; Independent variables= Providing information (PI), Sharing content (SC) and Accessing content (AC); Moderator variable=Protection; Dependent variable=Adoption of mobile marketing transactions; p<.05

* The change statistics are not very useful for the first step because it is comparing model 1 with an empty model (i.e., no predictors) which is going to be the same as the R^2

5.8.6.1. Hypothesis 9_a: The Moderating Effect of Perceived Protection on the Relationship between Providing Information and Adoption Varies with Gender

Moderated hierarchical regression analysis was used to ascertain whether the moderating effect of perceived protection on the relationship between providing information and adoption varied with gender. In Model 1, providing information, perceived protection, and gender explained a significant amount of variance in adoption, $R^2 = .549$, $F(7,731) = 126.320$, $p < .05$ as depicted in Table 5.20. In the second regression model (Model 2), the moderation term (Providing information*Protection*Gender) was added to regression Model 1 and the effect was significant, $R^2 = .563$, $F(1,731) = 20.550$, $\beta = 0.197$, $p < .05$. The moderation effect explains about 1.4 per cent ($\Delta R^2 = .014$) of the variance in strength of adoption, as calculated from the difference in the explanatory power for the model that includes the interaction term (Model 2, $R^2 = .563$) compared to the model that excludes it (Model 1, $R^2 = .549$). These results indicate that the moderating effect of perceived protection on the relationship between providing information and adoption varied with gender and as such warrant the acceptance of Hypothesis **H_{9a}**.

Since the direction of the moderation effect of perceived protection on the relationship between providing information and adoption was already illustrated through simple slope test (see Figure 5.15), to get an in-depth understanding of how the moderating effect varied with gender the Johnson-Neyman (J-N) region of significance technique (Johnson & Fay, 1950) was employed. This technique determined at which level of perceived protection its interaction effect with gender on the relationship between providing information and adoption varied (see J-N output in Table 5.21). Unlike the simple slope tests which mainly illustrate the direction of the effects of the independent on the dependent variable at a few selected values of the moderator, the J-N technique goes a step further by identifying regions over the entire range of the moderator variable where the simple effect of the focal predictor is significant and regions where it is not (Preacher, Rucker & Hayes, 2007).

Table 5.21: Conditional Effects of the Focal Predictor at Values of the Moderators

Perceived protection	Gender	*Effect (β)*	*t*	*p-value*	LLCI	ULCI
Low	Males	.245	9.377	.000	.397	.534
Low	Females	.220	8.122	.000	.202	.351
Moderate	Males	.251	12.823	.000	.480	.653
Moderate	Females	.230	10.123	.000	.397	.562
High	Males	.090	5.590	.134	-.027	.123
High	Females	.083	4.330	.184	-.035	.142

Note: Focal predictor= Accessing content; Moderator variables= Perceived protection and Gender; Dependent variable= Adoption; LLCI= lower level confidence interval; ULCI = Upper level confidence interval.

The J-N technique results depicted in Table 5.21 demonstrate that the influence of gender on the moderating effect of perceived protection between providing information and adoption was only positive and significant at low (1 standard deviation below mean score) as well as moderate (mean score) levels and not at high levels of perceived protection (1 standard deviation above mean score). Specifically, the results show that at low levels of perceived protection, males were more likely to adopt mobile marketing transactions (β = .245, p < .05) than females (β = .220, p < .05). The trend was also similar at moderate levels of perceived protection (males, β = .251, p < .05; females, β = .230, p < .05). However, at high levels of perceived protection, the interaction between gender and perceived protection on the relationship between providing information and adoption shifted from significant to non-significant (males, β = .090, p > .05; females, β = .083, p > .05); thus, illustrating that for high levels of perceived protection gender was a weak predictor of adoption of mobile marketing transactions. In other words, the moderating effect of high levels of perceived protection on the relationship between providing information and adoption did not vary with gender.

5.8.6.2. Hypothesis 9_b: The Moderating Effect of Perceived Protection on the Relationship between Sharing Content and Adoption Varies with Gender

To ascertain whether the moderating effect of perceived protection on the relationship between sharing content and adoption varied with gender, a moderated hierarchical regression

analyses was conducted. As can be seen in Table 5.20, the variables (sharing content, protection, and gender) in Model 1 of the moderated hierarchal regression accounted for a significant amount of variance in adoption R^2 = .342, $F(7,731) = 53.917$, $p < .05$. Incorporating the interaction term (Sharing content*Protection*Gender) on the second stage to regression Model 1 yielded a non-significant effect on the explanatory power of Model 2, ΔR^2 = .002, $F(1,731) = 2.663$, $p > .05$. Furthermore, the standardised coefficient (beta) value for the interaction effect was negative (β =-.073) and insignificant (p>.05), hence failing to support Hypothesis **H_{9b}**. A deduction can, therefore, be put forward that the moderating effect of perceived protection on the relationship between sharing content and adoption do not vary with gender.

5.8.6.3. Hypothesis 9_c: The Moderating Effect of Perceived Protection on the Relationship between Accessing Content and Adoption Varies with Gender

To test whether the moderating effect of perceived protection on the relationship between accessing content and adoption varied with gender, a moderated hierarchical regression analysis was conducted. As depicted in Table 5.20, in Model 1, accessing content, protection and gender explained a significant amount of variance in adoption, R^2 = .539, $F(7,731) = 121.539$, $p < .05$. In the second regression model, the interaction term (Accessing content*Protection*Gender) was added to regression Model 1 and the effect was significant, R^2 = .543, $F(1,731) = 15.474$, $\beta = 0.113$, $p < .05$. The moderation effect explained about 1.4 per cent (ΔR^2 = .014) of the variance in strength of adoption, as calculated from the difference in R^2 for the model that includes the interaction term (model 2, R^2 = .543) compared to the model that excludes it (Model 1, R^2 = .539). These results signal that the moderating effect of perceived protection on the relationship between accessing content and adoption do vary with gender and as such warrant the acceptance of Hypothesis **H_{9c}**. Table 5.22 provides a detailed illustration of the gender variation pertaining to the conditional effects of accessing content on adoption at three different levels of perceived protection using the J-N region of significance technique.

Table 5.22: Conditional Effects of the Focal Predictor at Values of the Moderators

Perceived protection	**Gender**	***Effect (β)***	***t***	***p-value***	**LLCI**	**ULCI**
Low	Males	.219	7.122	.000	.310	.494
Low	Females	.208	6.102	.000	.199	.351
Moderate	Males	.225	10.123	.000	.440	.593
Moderate	Females	.217	8.970	.000	.348	.522
High	Males	.080	3.120	.179	-.037	.119
High	Females	.069	2.010	.192	-.045	.122

Note: Focal predictor= Accessing content; Moderator variables= Perceived protection and Gender; Dependent variable= Adoption; LLCI= lower level confidence interval; ULCI = Upper level confidence interval.

The J-N technique results depicted in Table 5.22 demonstrate that the influence of gender on the moderating effect of perceived protection between accessing content and adoption was only positive and significant at low as well as moderate levels and not at high levels of perceived protection. Precisely, the results show that at low levels of perceived protection, males were more likely to adopt mobile marketing transactions (β= .219, p < .05) than females (β= .208, p < .05). As in the case of providing information, the trend was also similar at moderate levels of perceived protection (males, β= .225, p < .05; females, β= .217, p < .05). However, at high levels of perceived protection, the interaction between gender and perceived protection on the relationship between accessing content and adoption shifted from significant to non-significant (males, β= .080, p > .05; females, β= .069, p > .05); thus, depicting that for high levels of perceived protection gender was not a strong predictor of adoption of mobile marketing transactions. In other words, the moderating effect of high levels of perceived protection on the relationship between accessing and adoption did not vary with gender.

5.9. SUMMARISED DECISIONS

Table 5.23 provides a complete list of the hypothesis that were at the centre of investigation in this study, the corresponding estimates from the model, and summarised decisions based on the results of the research.

Table 5.23: Summary of Hypotheses Testing

Hypothesis		Decision
H_1:	Greater degree of mobile activity linked to providing information will result in greater mobile marketing transactions adoption.	Supported (β= .680, p < .05)
H_2:	Greater degree of mobile activity linked to sharing content will result in greater mobile marketing transactions adoption.	Supported (β= .075, p < .05)
H_3:	Greater degree of mobile activity linked to accessing content will result in greater mobile marketing transactions adoption.	Supported (β= .630, p < .05)
H_{4a}:	Perceived verification moderates the relationship between providing information and adoption	Supported (β= .123, p < .05)
H_{4b}:	Perceived verification moderates the relationship between sharing content and adoption	Supported (β= .840, p < .05)
H_{4c}:	Perceived verification moderates the relationship between accessing content and adoption	Supported (β= .142, p < .05)
H_{5a}:	Perceived authentication moderates the relationship between providing information and adoption	Not Supported (β= .007, p > .05)
H_{5b}:	Perceived authentication moderates the relationship between sharing content and adoption	Not Supported (β= .018, p > .05)
H_{5c}:	Perceived authentication moderates the relationship between accessing content and adoption	Not Supported (β= .006, p > .05)
H_{6a}:	Perceived protection moderates the relationship between providing information and adoption	Supported (β= .124, p < .05)
H_{6b}:	Perceived protection moderates the relationship between sharing content and adoption	Supported (β= .071, p < .05)
H_{6c}:	Perceived protection moderates the relationship between accessing content and adoption	Supported (β= .130, p < .05)
H_{7a}:	The moderating effect of perceived verification on the relationship between providing information and adoption varies with gender	Not Supported (β= -.,016 p >.05)
H_{7b}:	The moderating effect of perceived authentication on the relationship between sharing content and adoption varies with gender	Not Supported (β= -.112, p >.05)
H_{7c}:	The moderating effect of perceived protection on the relationship between accessing content and adoption varies with gender	Not Supported (β= -.009, p > .05)
H_{8a}:	The moderating effect of perceived verification on the relationship between providing information and adoption varies with gender	Not Supported (β= -.075, p > .05)
H_{8b}:	The moderating effect of perceived authentication on the relationship between sharing content and adoption varies with gender	Not Supported (β= -.097, p > .05)
H_{8c}:	The moderating effect of perceived protection on the relationship between accessing content and adoption varies with gender	Not Supported (β= -.082, p < .05)
H_{9a}:	The moderating effect of perceived protection on the relationship between providing information and adoption varies with gender	Supported (β= .197, p < .05)
H_{9b}:	The moderating effect of perceived protection on the relationship between sharing content and adoption varies with gender	Not Supported (β= -.073, p > .05)
H_{9c}:	The moderating effect of perceived protection on the relationship between accessing content and adoption varies with gender	Supported (β= .113, p < .05)

As depicted in Table 5.23, the influence of marketing related mobile activity on the adoption of mobile marketing transactions was found to be positive and significant ($p<0.05$) for all the three antecedents (providing information, sharing content, and accessing content), thus accepting Hypotheses **H_1, H_2** and **H_3** respectively. However, the moderating effect of perceived information security on the relationship between these antecedents of marketing-related mobile activity and adoption was only significant for perceived verification as well as protection and, therefore, supporting Hypotheses **H_{4a}, H_{4b}, H_{4c}, H_{6a}, H_{6b}** and **H_{6c}**. No evidence of the moderating effect of perceived authentication on the relationship between marketing-related mobile activity and adoption was established, thus Hypotheses **H_{5a}, H_{5b}** and **H_{5c}** were all rejected. Last, in determining whether the moderating effect of information security on the relationship between marketing-related mobile activity and adoption varied with gender, only Hypotheses **H_{9a}** and **H_{9c}** were accepted, with the remaining (**H_{7a}, H_{7b}, H_{7c}, H_{8a}, H_{8b}, H_{8c}** and **H_{9b}**) being rejected.

5.10. CHAPTER SUMMARY

The data analysis of this thesis was done and explained in this chapter. Various statistical tests including descriptive, chi-square, and regression analysis were conducted in order to explain the characteristics of the sample, and more importantly, to test the proposed conceptual model. As advised by Perry (2002), further discussion of the tests of the model and how they relate to existing literature and their implications is continued in Chapter 6.

CHAPTER SIX

DISCUSSION OF MAIN FINDINGS, CONCLUSIONS AND IMPLICATIONS

6.1. CHAPTER OVERVIEW

In alignment with the six-chapter thesis structure, this chapter continues with the discussion of the implications of the main findings as they relate to adoption of mobile marketing innovations (Perry, 2002). The chapter also outlines the main conclusions emerging from the study, followed by the study's implications on theory and practice. Finally, the chapter ends with an outline of the limitations of the study, as well as proposed areas for future research.

6.2. INTRODUCTION

In this concluding chapter, the research objectives set out in Chapter 1 will be evaluated. Overall, the implications of the findings on the body of knowledge are communicated with a view to not only guiding theory, but also to setting out practical implications and policy formulation. In the previous chapters, extensive review of the existing literature revealed, among other things, the following:

(a) Despite the vast developments within the m-Commerce industry globally, marketers in developing countries are still lagging behind in understanding why and how consumers engage in mobile marketing transactions. Furthermore, the literature pertaining to the determinants of mobile marketing transactions adoption, particularly in the South African context, remains largely inconsistent and fragmented as most previous studies are based on consumers in European and Asian markets (Beneke, 2011; Persuad & Azhar, 2012).

(b) Growth of the marketing related mobile activity globally implies that more consumers than ever before are vulnerable to information security threats. The problem is even compounded with the ongoing trend in Africa, specifically in the SADC region, towards information technology (IT) consumerisation (Stagliano et al., 2013) which has resulted in more and more consumer-owned mobile devices connecting with the corporate network. Niranjanamurthy et al. (2012) caution that the implementation of m-Commerce technology without securing its environment,

especially where transactions involve monetary value, is likely to cause serious conflicts between businesses and consumers.

(c) In view of the above, devising appropriate mobile marketing strategies becomes problematic and without a clear sense of which direction to take, marketing managers experience considerable difficulty in formulating strategies. Thus, there is a need for further research in the area.

Having identified the above-mentioned gaps within the literature, the following research problem was formulated:

> *While mobile commerce continues to gain momentum as a mainstream way for consumers to transact online, mobile marketing transactions in particular have recently been overshadowed by security panics, and m-Commerce's future relies upon information control against security threats as well as improving consumer security sensitivities.*

To address the above research problem, the conceptual frame (see Section 3.7.1) was formulated. The model was tested, and the results were reported in Chapter 5, and in the following sections the main findings, conclusions, and implications are outlined.

6.3. DISCUSSION OF THE MAIN FINDINGS

In this section, the results stemming from the main objectives of the study are discussed in detail. Specifically, the following three research main objectives were formulated to address the identified gaps and research problem:

I. To establish the influence of marketing-related mobile activity on the adoption of mobile marketing transactions.
II. To assess the role of perceived information security in moderating the relationship between marketing-related mobile activity and adoption of mobile marketing transactions.
III. To determine the variation in the moderating effect of perceived information security on adoption of mobile marketing transactions by gender.

The above outlined research objectives paved way to the formulation of the following hypotheses:

H_1: Greater degree of mobile activity linked to providing information will result in greater mobile marketing transactions adoption.

H_2: Greater degree of mobile activity linked to sharing content will result in greater mobile marketing transactions adoption.

H_3: Greater degree of mobile activity linked to accessing content will result in greater mobile marketing transactions adoption.

H_4: Perceived verification moderates the relationship between:

H_{4a}: Providing information and adoption

H_{4b}: Sharing content and adoption

H_{4c}: Accessing content and adoption

H_5: Perceived authentication moderates the relationship between:

H_{5a}: Providing information and adoption

H_{5b}: Sharing content and adoption

H_{5c}: Accessing content and adoption

H_6: Perceived protection moderates the relationship between:

H_{6a}: Providing information and adoption

H_{6b}: Sharing content and adoption

H_{6c}: Accessing content and adoption

H_7: The moderating effect of perceived verification varies with gender on the relationship between:

H_{7a}: Providing information and adoption

H_{7b}: Sharing content and adoption

H_{7c}: Accessing content and adoption

H_8: The moderating effect of perceived authentication varies with gender on the relationship between:

H_{8a}: Providing information and adoption

H_{8b}: Sharing content and adoption

H_{8c}: Accessing content and adoption

H_9: The moderating effect of perceived protection varies with gender on the relationship between:

H_{9a}: Providing information and adoption

H_{9b}: Sharing content and adoption

H_{9c}: Accessing content and adoption

Guided by the positivist paradigm, the hypotheses outlined above necessitated a robust diagnosis of the study phenomena. The subsequent sections break down the findings emerging from the objectives of the study, beginning with the first objective.

6.3.1. Implication of Marketing-Related Mobile Activity on Adoption

Overall, the results highlight the increasing importance of marketing-related mobile activity on influencing consumers' decision making towards adoption of mobile marketing transactions. Specifically, the results show the importance of interactive marketing between consumers and online retailers as evidenced by the positive significant relationships between all the predictor variables (i.e., providing information, sharing content, as well as accessing content) and adoption of mobile marketing transactions. Mangold and Faulds (2009) found that in recent years, mobile-marketing related activity has become a new hybrid component of integrated marketing communications that allows online retailers to establish strong relationships with their consumers. This, therefore, means that marketing-related mobile activities of providing information online, sharing information about a product and services, and accessing content online all prompt interaction between retailers and consumers. According to Pittaway (2017), the rise in Internet connectivity and affordability of smartphones in the South African market have all contributed to a surge in the mobile activity linked to marketing. Thus, more consumers now have devices capable of connecting with online businesses on a variety of online information-sharing formats including: merchants' websites, social networking sites (SNSs) (e.g., Facebook, MySpace and Whatsapp), creativity works-sharing sites (e.g. YouTube and

Flickr), collaborative websites (e.g. Wikipedia), and microblogging sites (e.g. Twitter) (Chu & Kim, 2011).

The above-mentioned sites foster a brand's understanding of the market, as consumers can readily access or share relevant information with businesses. Furthermore, brands with a strong consumer following can benefit from starting a direct line of communication which necessitates engagement with the very consumership that purchases their products or services. It is through this direct communication that consumers can create rapport and trust with online retailers. Consequently, this leads to reduction in information privacy fears and consumers can voluntarily provide personal information to marketers, which ultimately positively trigger consumer decision making in mobile marketing transactions. Davis (2019) also highlights the significance of marketing-related mobile activity in steering adoption of m-Commerce. According to the author by going online, business can chart out their marketing strategies; for instance, they can ask consumers to share their views on a new product, suggest a flavour for a specific food brand, and even ask consumers to submit their art for a new logo or product cover. Furthermore, online businesses are not just sticking to content alone, but also creating entertaining podcasts and videos aimed at promoting ideas for new products and campaigns. Resultantly, this process makes consumers feel more involved in the marketing process, and the fact that they can provide some input in the process makes them more likely to transact online.

Contrary to the researcher's expectation an interesting finding was that the likelihood of sharing content for the South African student consumers had a moderate significant influence on the adoption of mobile marketing transactions (H_2; $\beta = .075$, $p < .05$) when compared to providing information (H_1; $\beta = .680$, $p < .05$) and accessing content (H_3; $\beta = .630$, $p < .05$) respectively as evidenced by the betta coefficients. This finding, according to Gao et al. (2010: 580), may be explained by the fact that 'youth consumers are so immersed in using mobile devices as a tool of interpersonal communication with friends and may have a particular tendency to keep their world free of outside commercial interferences'. Thus, youthful consumers disseminate brand-related information less in their established social networks where most of the sharing content activity is executed; they are more likely to engage in the mobile activity of providing information and accessing content with online business individually.

Jointly, the above findings suggest that South African consumers' use of mobile phones for marketing related mobile activity may serve as a priming factor for future engagement in mobile

marketing transactions. The results, hence, lend credence to the inclusion of the mobile-related marketing activity construct in the conceptual model. The inclusion of the construct is also validated by results from similar surveys conducted among university student segments in China, the USA, and Pakistan (See Gao, et al., 2010; Sultan, et al., 2009).

6.3.2. Implication of Information Security on Adoption

HowSouthAfrica (2018) reports that around 80 per cent of South African online consumers agreed they were more concerned about their security when transacting online than when transacting in a physical store, and more than 50 per cent of these consumers were particularly concerned about information security as a barrier when making online transactions. Hence, the statistics strengthens the study's motive for the inclusion of information security as a moderator variable. This section discusses the implication of the three sub-constructs of information security (i.e., perceived verification, authentication, and protection) on adoption, based on the results established in Chapter 5.

6.3.2.1. Perceived Verification

Findings from the study as exhibited in Chapter 5 indicate that the information security variable of perceived verification significantly influenced marketing-related mobile activity, which in turn led to greater adoption of mobile marketing transactions; implying that positive consumer perceptions regarding online verification significantly influences the likelihood of South African University student consumers adopting mobile marketing transactions through their engagement in mobile activity related to providing information (H_{4a}), sharing content (H_{4b}), and accessing content (H_{4c}).

Since this study is one of the first to examine the moderating effect of perceived verification on marketing related mobile activity's effects on adoption, there is currently lack of precise supporting evidence to that effect. Nonetheless, taken together, the available past research (e.g., Filieri, 2016; Shan, 2016; Sparks, et al., 2016) illustrates the importance of online consumers' perceived verification in stimulating adoption of m-Commerce transactions. Hence, these studies demonstrate the efficacy of the variable in increasing the explanatory power of already established direct relationships such as those which are hypothesised in the study. The perceived verification construct was operationalised as the ability of the respondents to

determine the genuineness of an online merchant's website. The major determinants of a website's genuineness that formed part of the perceived verification variable were customer reviews and testimonials. These two were all found to evoke an incremental explanatory power to the effects of marketing-related mobile activity on adoption of mobile marketing transactions. In support Sparks, et al. (2016), finds that the provision of customer reviews online yielded significantly more favourable trust and consumer inferences towards a particular online business. This notion is further supported by Shan (2016) who alludes that 'top reviewer' status serves as a reputation cue and helps to form the perceptions of the reviewer's competence and trustworthiness; and that reviews that contained strong arguments had a greater trustworthiness than those that contained weak arguments.

Specifically, examining the relationship between marketing-related mobile activity and adoption from the findings it can be said that consumers feel safe to provide information as well as access content on websites that have received strong reviews and testimonials from other consumers. Likewise, through social media networks where most of the sharing content activity is undertaken, an opportunity is afforded for customers and the public to read, comment, create, and share information about products, brands, and companies. Hence, through such information consumers are assured of previous transactional relationships which existed between a specific online merchant and other consumers. This assurance becomes integral in establishing trust bonds between online businesses and consumers and, in turn, positively drives adoption of mobile marketing transactions. In addition, if trust bonds are created between businesses and its customers, it implies that security fears for providing personal information by consumers are reduced. According to Benlian, Titah, and Hess (2012: 243) 'consumer reviews are user-created digital content and are not based on system-filtered content but, rather, on original, first-hand content, where a software system does not interfere with the recommendation generation process', therefore making them highly reliable verification measures. Filieri (2016) also weighs in, stating that consumers use cues that are related to the valence of a review and the more a review is perceived to be trustworthy, the higher its influence on consumer decision making.

The above discussion further gives impetus for the inclusion of perceived verification in the study conceptual model as a moderator between marketing-related mobile activity and adoption of mobile marketing transactions.

6.3.2.2. Perceived Authentication

Results of the hierarchical moderation regression analysis summarised in Table 5.18 revealed that perceived authentication was the only information security construct which failed to yield a significant moderating effect on the relationship between marketing-related mobile activity and adoption of mobile marketing transactions. While the researcher's postulation which was also guided by empirical support (e.g., Chang, Cheung, & Tang, 2013; Chellappa & Pavlou, 2002; Hu, Wu, Wu, & Zhang, 2010) would insist that perceived authentication moderates the relationship between marketing-related mobile activity and adoption, the results from the study do not seem to confirm this. Nevertheless, as highlighted in Chapter 2, debate around gaining consumers' trust of online merchants through third-party authentication approvals and endorsements is still unfolding. The study results are consistent with findings from some previous scholars, who found perceived authentication to be an unreliable driver of adoption of mobile commerce transactions (Aiken & Boush, 2006; Miyazaki & Krishnamurthy, 2002; Williams, 2010). Unlike the current study, these studies did not specifically examine perceived authentication as a moderator variable but, however, highlighted its effect on consumers' adoption of mobile commerce. For instance, Aiken and Boush (2006) argue that most consumers are unfamiliar with the online firms issuing third part authentication seals while some do not even understand their relevance and, as such, rendering third party seals less effective.

Specific to the South African market, Joubert and Van Belle (2013) establish that South African consumers are mostly not aware of the firms that are accountable for delivering authentication seals, often resulting in consumers' absence of trust for online merchants. An earlier study by Williams (2010) which employed an experimental design indicated that the majority of South African consumers who visited a particular merchant's website were not aware of the presence of a third-party seal and were not consciously seeking out the seal as a visual clue which signals a website's security. However, on the contrary, a study conducted by CXL Institute (SPS Commerce, 2018) found out that most Americans were aware of third party-seals with brands like Visa, Mastercard, PayPal, and Norton being the most common. The respondents further revealed that trust seals made them feel more secure when transacting online. In supporting this finding, another survey by IBM (Etzioni, 2019) of 679 American Internet users also found that 70 per cent of respondents revealed only transacting on merchants' sites that displayed security authentication seals, which reduced their privacy concerns. In an effort to bring harmony concerning the often-contradictory empirical findings, Kerkhof and van Noort

(2010) advise that caution should be exercised when making deductions since the effects of authentication seals on adoption of mobile commerce transactions are studied in different consumer contexts, using different kinds of seals.

Consistent with the above notion, lack of awareness appears to be the major contributing factor inhibiting perceived authentication's ability to increase the explanatory power of marketing-related mobile activity's effect on adoption of mobile marketing transactions among South African consumers. Consequently, if consumers' are not aware of authentication seals, then the presence or absence of such seals would be irrelevant to them. An alternative explanation to this occurrence can be linked to the sample of the study which consists of university students who mostly do not get involved in higher value online shopping carts (Jadhav & Khanna, 2016). In their study, Özpolat & Jank (2015) found that third-party seals were more effective for higher value shopping carts which often involve disclosing much information and thus, making consumers to feel they are at risk. Given that most South African students, unlike those from developed countries, have lesser disposable income, they tend to purchase less expensive products which are often on promotions; for instance, apparels, electronic goods, and books. Therefore, in the process, they tend to be unaware of what online stores' display of third party seals implies.

From the foregoing discussion, despite a negative outcome regarding the moderating effect of perceived authentication on adoption being established, it becomes tentative to make a solid conclusion that the inclusion of the variable in the conceptual model was not worthwhile. Rather, the variable can be considered a valuable diagnostic measure which unearthed South African consumer's lack of awareness regarding third-party authentication seals. Ideally, with marketers instituting proper awareness campaigns for such seals, future research should include actual purchase transactions where the third-party seals are present and the respondents' put through the motions of executing a mobile marketing transaction.

6.3.2.3. Perceived Protection

Perceived protection as postulated by Chellappa and Pavlou (2002) is one of the significant information security antecedents that were tested in this study. Specifically, the variable was proposed to moderate marketing-related mobile activity's effects on adoption of mobile marketing transactions. Unlike with perceived authentication, results from the study revealed some significant moderating effects of perceived protection on the relationship between all the

three antecedents of marketing-related mobile activity and adoption of mobile marketing transactions. The results specifically revealed a positive interaction between respondents' perceptions regarding websites' protection features and their participation in marketing-related mobile activity which in turn had a ripple positive effect on their adoption behaviour towards mobile marketing transactions.

Despite lack of empirical evidence of studies which specifically tested the moderating role of perceived protection on the relationship between marketing-related mobile activity and adoption of mobile marketing transaction, there seems to be consensus among previous studies of the importance of perceived protection in positively influencing mobile commerce adoption (e.g., Ming-Yen Teoh et al., 2013; Pingitore, Rao, Cavallar, & Dwivedi, 2017; Wu, Huang, Yen, & Popova, 2012). Pingitore et al. (2017), for instance, in their study establish that consumers want adequate protection of their personal data in order for them to be more willing to transact online. Specifically, the respondents indicated that they felt protected when transacting online if online merchants: (1) are transparent about how they intend to use consumer data, (2) allow consumers to easily opt out of providing data, and (3) provide brief and readily understandable privacy policies and agreements. Privacy policies, unlike authentication seals which sometimes appear like just pasted images, communicate better; and awareness of such policies among consumers is high when comparing with authentication seals (Bhasin, 2012). As espoused by Wu et al. (2012), consumers' perceived protection features such as privacy policies are significant mechanisms for reducing the risk associated with online information disclosure, and they help consumers decide whether or not they want to provide personal information or to choose not to partake in online transactions at all.

Interestingly, despite the overwhelming empirical evidence pointing to the importance of consumers' perceptions regarding online protection features such as privacy policies, the study found them to elicit a weak positive moderating effect on sharing content's effect on adoption of mobile marketing transactions - as substantiated by the very low betta value (β= .071, p < .05). This outcome suggests that information security fears are limited concerning the marketing-related mobile activity of sharing content. This can be attributed to the fact that in sharing content, which is normally executed within social networks, online merchants are indirectly involved as the activity mainly involves close network relationships (e.g., friends, family, and colleagues). Thus, less marketing-related information is shared among the youth within social networks where their main thrust is social gratification, which implies that privacy concerns are also often modest. Kokolakis (2015, cited in Jackson, 2018: 24) elaborates on

this scenario by stating that 'active participation in online social networks, which involves self-disclosure, is associated with three fundamental needs: (1) the need for diversion and entertainment, (2) the need for social relationships, and (3) the need for identity construction'. Hence, for the majority of young consumers, satisfying the above needs outweighs the possible risks of revealing personal information for marketing purposes (Jackson, 2018). Kokolakis (2015) recognises that South African youths are, however, cognisant of privacy threats surrounding social media networks and they employ a variety of protection strategies, such as falsifying information, limiting access to their mobile devices by changing their privacy settings, restricting friendship requests, as well as removing tags and photos.

Overall, as elaborated by the results as well as the supporting empirical literature, it is evident that the perceived protection variable plays a dominate role in moderating consumers' choice to adopt mobile marketing transactions, which provides further reassurance that its inclusion in the conceptual model was worthwhile.

6.3.3. The Role of Gender in Shaping Security Perceptions

Upon examining the moderating role of information security variables on the relationship between marketing-related mobile activity and adoption, the study further sought to determine whether gender had any role in shaping the respondents' security perceptions. Particularly, the study established the variation in the moderating effect of perceived information security on adoption of mobile marketing transactions by gender. Despite the dearth of empirical support pointing to the moderating effect of gender specifically between marketing-related mobile activity and adoption, the extant literature is replete with studies suggesting that gender has a crucial role in shaping consumers' security fears when transacting online (e.g., Awad & Ragowsky, 2008; Ciganek & Jarapatruin, 2004; Hajli & Lin, 2016). All these studies seem to agree that women have more concerns about their privacy and security issues than men, and are more sensitive to potential information invasion when they share information online. Very few studies, for instance Griffin and Viehland (2011), found conflicting results which showed that there were no significant differences in the perceived information security risks related to online shopping between males and females.

Results from the study established that the moderating effect of information security on adoption only varied with gender for the perceived protection variable and this effect was positively significant between the effects of providing information (β = .197, p < .05) and

accessing content (β= .113, p < .05) on adoption of mobile marketing transactions. Concerning the sharing content / adoption relationship, there was no evidence of any gender variation on the moderation effect caused by perceived protection (β= -.073, p > .05). Specifically, the results showed that females were more concerned about the underlining online website's protection features when engaging either in the mobile activity of providing information or accessing content and no effect was established for the mobile activity of sharing content. From the results, a deduction can hence be put forward that gender is a strong determinant of consumers' information security perceptions only for perceived protection, and has no effect on perceived authentication as well as verification. This, therefore, implies that online protection mechanisms such as privacy policies are more effective in signalling protection of information security for females than it does for males. In addition, perceived control of information is more likely to be important in the formation of attitudes towards providing and accessing information online for women than for men. In other words, from these findings, it is clear that even in making decisions to adopt mobile marketing transactions, it is expected that females are more risk averse than males.

The insignificant results which were established concerning gender variation regarding the moderating effect of perceived verification on marketing-related mobile activity's effect on adoption, appear to contradict the findings from previous studies. For instance, in a study aimed at ascertaining gender differences in consumers' perceptions of online consumer reviews by Bae and Lee (2011), the results show that the effect of online reviews on adoption of online transactions was stronger for females than males. These results are also supported by Zhang, Cheung, and Lee (2014) who establish that online verification such as reviews from others about a certain brand pose a stronger effect on females than males, thereby reducing perceived risk of online shopping and increasing willingness to adopt online mobile transactions. The contradiction of the study results from past findings can be attributed to the research design employed. For instance, both studies by Bae and Lee (2011) as well as Zhang et al. (2014) employed the experimental design based on actual online review on the Internet, while the current study was based on perceptions of respondents which were acquired through a self-administered survey.

6.4. SUMMARY OF KEY FINDINGS

Quite a number of important conclusions can be drawn from the study findings. In particular, three major conclusions emerged and are discussed next.

6.4.1. Marketing-Related Mobile Activity Stimulates Adoption

Firstly, the study concludes that marketing-related mobile activity plays an imperative role in stimulating consumers' participation in mobile marketing transactions. Importantly, marketing-related mobile activity promotes engagement between business and consumers, which significantly leads to positive attitudes toward the adoption of mobile marketing transactions. Furthermore, the mobile activity of providing information online, sharing information online, and accessing content online combined play a contributory role in speeding consumers' decision making process. Unlike the conventional shopping behaviour that mainly involved visiting brick and mortar stores and often leads to some prolonged decision making, contemporary online shopping triggered by mobile-marketing related activity implies that consumers are now much better informed. Thus, the time taken to make purchasing decisions in the mobile commerce environment has significantly been reduced. The study also makes an important conclusion that perceived information security provides better explanatory power in determining the relationship between marketing-related mobile activity and adoption of mobile commerce transactions.

6.4.2. Greater Consumers' Information Security Concerns

The study furthermore concludes that South African consumers place greater emphasis on the security of their personal information when making online mobile marketing transactions. Fundamental to the issue of information security are clearly perceptible signals which give assurance to consumers that their personal information is adequately secured. Combined, these signals can be categorised into three information security constructs which comprise of perceived verification (e.g., online reviews and testimonials), authentication (e.g., third-party seals), and protection (e.g., privacy policies). However, the study established that despite empirical evidence of perceived authentication playing an important role in evoking trust towards online transactions, its effect on the study sample was insignificant. Nevertheless, the insignificance of the result did not lead the researcher into disregarding the role of perceived authentication or its inclusion in the conceptual model since through consulting past studies, lack of awareness of third party seals among South African consumers was found to be the major driving force. Resultantly, proper awareness and education campaigns of the relevance of third-party seals need to be implemented by South African marketing managers in order to promote the recognition of third-party seals by online consumers. The final important conclusion from the study relating to the moderating effect of information security on adoption

is that online protection mechanisms,, such as privacy policies, are more effective in signalling protection of information security for females than it does for males. As such, it can be assumed that females' risk perceptions towards disclosure of private information generally makes them feel uncomfortable to transact online.

6.4.3. Lower Youth Participation in Mobile Marketing

Regarding youths' participation in mobile marketing, the study concludes that South African youths are still lagging behind, as attested by the study results. For instance, the findings from the study reveal that the majority of South African university students do not appear to put a great deal of effort into reading and evaluating the various mobile marketing notifications they receive on their mobile devices. In addition, when the respondents were asked to indicate their primary use of the Internet, the majority (68.5 per cent) revealed using the Internet primarily for communication and entertainment. Only half of these (31.4 per cent) used it for mobile commerce related activities. Empirical evidence also agreed that students generally tend to show a weak openness to marketing techniques through their mobile devices, even though they like spending much time browsing on the Internet. It is through this browsing that these consumers are expected to interact with businesses by engaging in marketing-related mobile activity. The major reasons raised within the literature for the low participation in mobile marketing by South African students were, amongst others, the lack of interactivity, and numerous un-customized notifications which are often annoying.

The above-identified factors contributing to the low participation by students in the mobile marketing activity, according to Constantinides (2004), can be classified as functionality factors. The author found functionality factors to be very influential in affecting online consumer behaviour and includes other factors such as site accessibility, site speed, and site navigation. These factors also have some direct effects on consumers' engagement in the mobile-related marketing activity. For instance, easier site accessibility coupled with quicker site speed and ease of navigation enable consumers to rapidly access, share, and provide information using the site. Similarly, high interactivity and customisation of consumer information are likely to foster greater participation in marketing-related mobile activity which in turn stimulates adoption of mobile marketing transactions.

6.5. IMPLICATIONS FOR THEORY, POLICY, AND PRACTICE

This section discusses implications of the study for theory, policy, and practice. Importantly, this study has not only made significant contributions in its immediate discipline, but also generated implications for a wider body of knowledge about this topic where other disciplines could benefit from its findings.

6.5.1. Implications for Theory

On the whole, the results indicate that both marketing-related mobile activity and perceived information security are important antecedent predictors of consumer choice behaviour and adoption patterns for mobile marketing innovations. Thus, the study adds to the growing support on past studies illustrating the role of marketing related mobile activity and information security as antecedent factors influencing adoption of mobile marketing transactions. In addition, there is sufficient evidence from the study to suggest that the underpinning theory applied in this study, namely the UGT (Katz et al.,1973), is applicable in generating adoption decisions involving mobile technology and, in particular, in the context of the youthful mobile users. Hence, the study responds to recent calls for the need of alternative theories, models, and knowledge for virtual buying behaviour that expands the domain of inquiry beyond the initial innovation attribute level; yet responding to the behaviour of contemporary consumers (Dost et al., 2016). More importantly, it should be noted that the results observed in the study do not in any way point to any weakness of the theoretical frame applied in this thesis. Rather, the results suggest the applicability and robustness of the tested theory in developing nations such as South Africa; a context where its testing was previously almost silent in academic literature.

A number of prominent adoption models were identified in literature but it appears that these models only partially explained the innovative marketing adoption decisions phenomena. What is lacking, though, is the inclusion of moderator variables which increase the explanatory power of models and lessen misinterpretation, besides providing better explanation of the complex issues normally associated with consumer behaviour research (Alsaad et al., 2017; Islam et al., 2011; Slade et al., 2015). The study, therefore, recommends incorporating a set of moderating variables into innovation adoption conceptual frames to enhance their explanatory power. Of importance is online security which is one of the issues researchers as well as practitioners frequently associate with the success or failure of online ventures

(Constantinides, 2004). As such, this implies that online security can be extensively applied in most mobile commerce adoption studies as a moderator variable.

Finally, the study findings, contribute enormously to the practice of scientific inquiry in that they significantly increase the expanse of the wider body of knowledge. Having said that, there still is a need for future research to explore these phenomena further. For instance, since the variation on the moderating effect of perceived information security on adoption of mobile marketing transactions by gender was less significant, future studies may delve further into the complicated effects of diverse demographics beyond gender**.**

6.5.2. Practical Implications for Mobile Services Providers and Policymakers

In South Africa, in as far as promoting an efficient mobile retail sector and also maintaining high levels of security for consumer privacy is concerned, policymakers and mobile services providers can contribute significantly. Firstly, policies relating to the victims of cyber theft and financial fraud need revisiting. Although it is acknowledged that the South African mobile retail sector operates in a very risky environment, failure on the part of policymakers and also of mobile service providers themselves will result in negative consequences. Mobile service providers need to be cognisant of the high levels of digital ignorance, and to a certain extent digital poverty, among the consumers. Hence, active procedures aimed at protecting consumers through legislation, further training, and setting up complaint and advice centres may actively contribute to better protection of consumers. If unchecked, the repercussions may be drastic – customers may associate ‘criminals’ with mobile businesses who habitually dispossess them of their personal and financial information as well as hard-earned money. As a result, the law should better protect online consumers and the government need to ensure full enforcement of The Protection of Personal Information (PoPI) Act, No 4 of 2013.

According to Botha, Grobler, Hahn and Eloff (2017) South Africa is in the process of complying with the Act, but is facing enforcement challenges. In order to fast track the enforcement PoPI Act the study recommends policy makers to carefully look at how other nations managed to enforce information privacy laws. For instance, the General Data Protection Regulation (GDPR) which aims primarily to give control to individuals over their personal data (Mondschein & Monda, 2019) was successfully enforced within European Union countries. According to the regulation, data controllers must design information systems with privacy in mind, for instance use the highest-possible privacy settings by default, so that the datasets are

not publicly available by default, and cannot be used to identify an individual consumer (Eriksson, 2019). In addition, no personal data may be processed unless this processing is done under one of six lawful bases specified by the regulation (consent, contract, public task, vital interest, legitimate interest or legal requirement).

Strategic partnerships between mobile service providers and online businesses should be encouraged; for example, in 2017 Vodacom unveiled its on-demand video service which let consumers access and pay MultiChoice's TV services, on-demand content services, and the ShowMax service all in one app. Thus, legislation should be harmonised in a way that encourages such partnerships as they allay consumer security fears. Mobile service providers also need to periodically perform assessments to confirm that their mobile policies, processes, and procedures are being followed properly. This includes, among others, checking for system upgrades, detecting and documenting anomalies within the mobile network infrastructure and performing vulnerability scans. Lastly, it is important for policy makers to engage with various mass media such as radio, television, and newspapers so as to conduct extensive awareness campaigns on the importance of ensuring data protection when executing various online activities, specifically online transactions.

6.5.3. Practical Implications for Marketing Managers

A key finding that arose from this research is that while the existing body of knowledge might have validated the importance of marketing related mobile activity in stimulating adoption of mobile commerce transactions, the effect is even greater if consumers feel that their information privacy is adequately secured. As a result, when consumers' personal and financial information is used effectively, it enables companies to enhance customers' experience, whilst in the process winning their trust. Marketing managers need to be cognisant of the importance of implementing proper security mechanisms as one of the fundamental aspects of online business strategy. In addition, they should consider viewing data privacy and security not just as a risk management issue, but as a potential source of competitive advantage that may be a central component of brand-building and corporate reputation. Failure to uphold consumers' security often results in reputational damage to brands, loss of current as well as new consumers, and constant lawsuits from consumers.

The first important step to ensure customers' security of their personal and financial information is for online businesses to conduct data privacy audits. While many businesses collect more data than they realise, it is essential to understand what data they need, how that data is being stored, and how securely that data is protected. Thus, marketing managers need to understand that lack of attention to data collection is what often sparks a major crisis; for instance, the recent Facebook data privacy scandal which centres around the collection of personally identifiable information of up to 87 million customers by the political consulting and strategic communication firm Cambridge Analytica. This implies, therefore, that online businesses need to ensure that they implement and enforce clear and visible privacy measures which send cues to consumers concerning security of their private information. To achieve this, marketing managers need to take the modern consumer's mind-set as an important part of building a brand of strong data privacy and security practices. 'Taking the consumer mind-set' entails developing a vision and strategy for using and securing consumer data with an acute awareness of how consumers might interpret the company's activities.

Another important finding which emerged from the study is that South African youth have not yet widely embraced the use of online transactions. In order to address this, as discussed in Section 6.4, online businesses need to improve on the aspect of website functionality. Of importance, websites need to be always active so that consumers feel real-time online experience; this facilitates interaction between online merchants and consumers. Information displayed on merchants' websites also needs to be relevant and customised according to the preference and characteristics of the targeted consumer segment. For instance, tertiary students who are largely youthful are mainly fun seekers and as such besides being informative, marketing information intended for the youth also needs to be entertaining in order to drive marketing related mobile activity. Furthermore, the youth generally have been found to be multi-taskers who commonly engage in several online activities in parallel. Consequently, online merchants need to prevent them from abandoning their websites through easier site accessibility and navigation, coupled with good MBPS speeds.

Finally, by factoring in the conclusions emerging from both the empirical support and observed study findings outlined in Section 6.4, the researcher further recommends to marketing managers an enhanced integrated framework depicting the factors found to influence adoption of mobile marketing transactions (see Figure 6.1).

6.5.2.1. The Enhanced Integrated Mobile Marketing Transactions Adoption Framework

The initial conceptual model discussed in Chapter 3 was mainly statistical and facilitated the implementation of the overall research design as well as guiding the research's direction. This chapter goes a step further by proposing the Enhanced Integrated Mobile Marketing Transactions Adoption Framework depicted in Figure 6.1, which is a practical implication tool for marketing managers. The framework integrates supporting literature with the study findings, thereby putting into perspective the unique characteristics of a mobile-based commercial environment that influences adoption of mobile marketing transactions, especially amongst the youthful consumers.

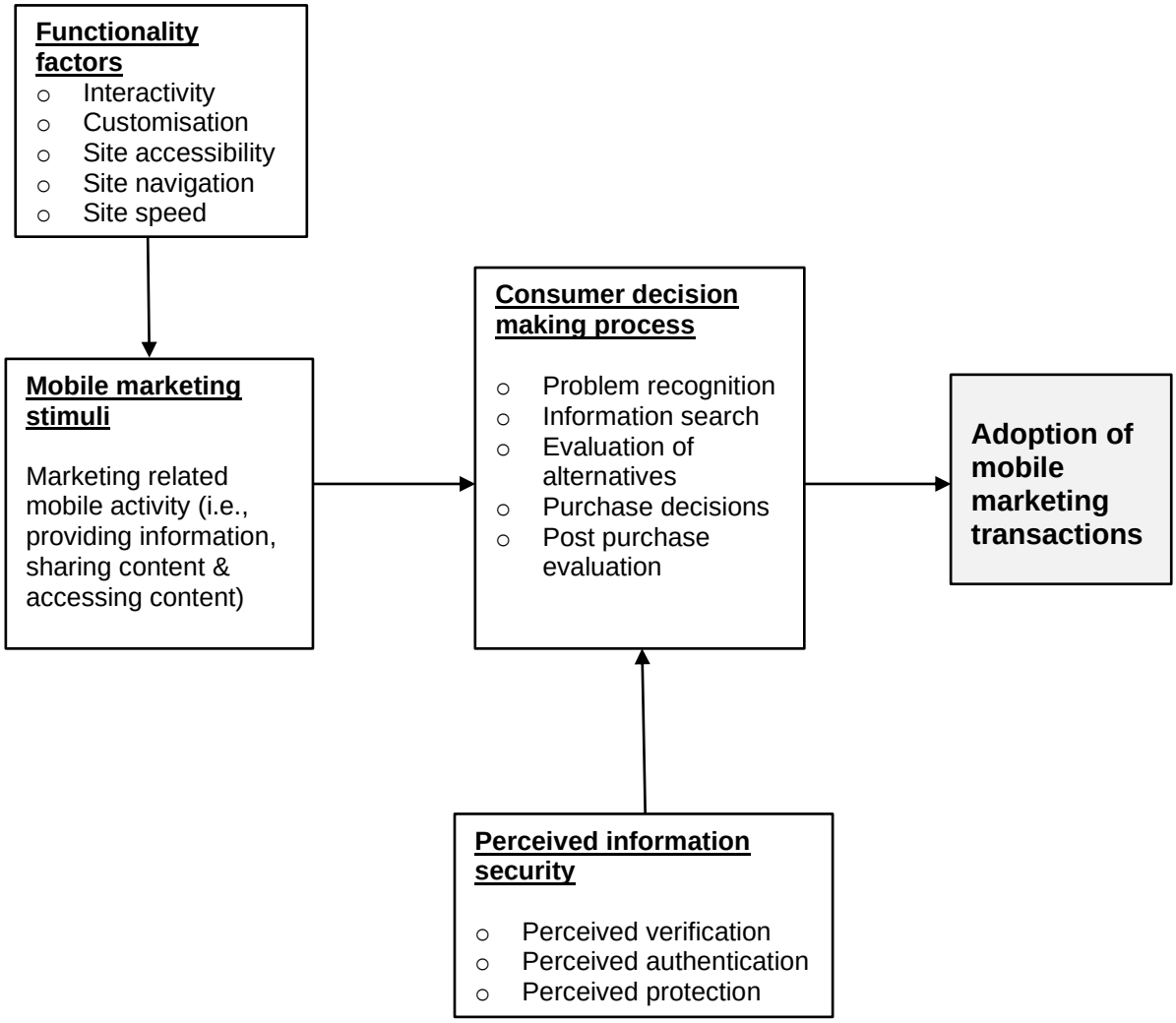


Figure 6.1: Enhanced Integrated Mobile Marketing Transactions Adoption Framework

Arguably, as depicted in Figure 6.1, the integration to the conceptual framework of the online merchant's site functionality factors and consumer decision making process provides marketing managers with a more comprehensive appreciation of the forces driving the online consumer's behaviour. Thus, the study argues that an integrated approach which blends elements from the empirical literature and study results better offers more reliable insights to the fundamental question of why mobile commerce adoption succeeds or fails. In the enhanced integrated framework, mobile marketing related activity is shown to be boosted by website functionality factors and is projected to be the main mobile marketing stimulant amongst the youth consumers. In turn, mobile marketing-related mobile activity just as outlined in the conceptual framework devised in Chapter 3 drives adoption of mobile marketing transactions. However, central to this effect and any other m-Commerce adoption decision are the phases which consumers follow from recognising a problem until the post-purchase evaluation phase. Marketing managers need to understand that the post-purchase behaviour determines whether adoption of m-Commerce transactions is successful or not, through consumers' levels of satisfaction derived from the online transaction process via their mobile devices. Dissatisfied consumers often complain or abandon the online products or services, whilst on the other hand satisfied consumers promote the products or services and are likely to make further purchases. It is these further online purchases of products or services which render adoption of online mobile transactions successful.

Constantinides (2004: 112) states that 'while many researchers do not see any fundamental differences between the traditional and online buying behaviour, it is often argued that a new step has been added to the online buying process: the step of building trust or confidence'. Consequently, the study postulated perceived information security as the major dimension of trust which affect the online buyer's decision making process. Exposure to information security threats can affect consumer's decision-making process by inflicting uncertainty or perceived risk associated with online purchasing among consumers. This implies that in practice the actual adoption of mobile marketing transactions can be consistent with the enhanced integrated framework, depending on the buyer's perceived information security risks. Unlike the brick and mortar retail environment, in the mobile-marketing transactions context, consumers' level of perceived information security risk may be magnified due to limited physical access to products and sales personnel, thereby complicating the buying decision making process. Online marketing managers can, therefore, influence the decision-making process of the virtual consumers and avoid high abandonment rate of online transactions through safeguarding consumers' information privacy. Overall, by capturing the fundamentals

of earlier studies and the important dimensions of m-Commerce emerging from the results, the enhanced integrated framework simplifies the formulation of online marketing strategy by limiting adoption determinants to the most proximate constructs.

6.6. LIMITATIONS

As usual in research, this thesis is not free of limitations; having said that, the limitations do not negatively impact on the study itself. It is very encouraging to note that previously validated scales were used to collect data from a relatively large sample (n = 810), spanning across three selected universities across South Africa. All the same, the limitations associated with the present study are as follows: Firstly, while the sampling technique helped to gather data from an important consumer segment within the mobile market (i.e., the youth market), the findings from this research are limited in that the data was obtained from a narrow sampling frame of primarily university students only. Hence, a wider spectrum of consumers could have also participated. Secondly, the research design employed can also be viewed as a limitation as participants were not exposed to actual websites carrying security features and the data obtained was based on their perceptions regarding information security on adoption.

6.7. IMPLICATIONS FOR FUTURE STUDIES

In view of the foregoing, future studies could consider using experimental designs in order to acquire an in-depth knowledge of consumers' decision making processes. It would also be insightful to draw samples from other neighbouring countries to determine whether there is a common pattern within the region. Studying different sample groups, including the elderly and professionals, might also provide valuable insights. This would be particularly important to practitioners and policymakers in formulating policy in preparation for a unified mobile retail sector in the region. Comparative analysis, especially between emerging and developed markets, may also provide a better understanding of consumers' decision making regarding effects of information security on adoption of mobile commerce innovations.

6.8. CONCLUSION

The purpose of this thesis was to consider the relative importance of information security in predicting adoption of mobile marketing transactions. In order to achieve the later, research

objectives and several hypotheses were formulated and presented in Chapter 1, and justified in Chapter 3. Chapter 2 analysed the existing body of literature as it relates to the theory and practice of mobile marketing, whilst the conceptual frame developed in Chapters 3 was also used as a basis for data collection. In Chapter 4 the methodology used to answer the research question and to test hypotheses was discussed. Chapter 5 provided an outline of the data analysis procedures. Discussions of findings emanating from the main objectives, implications, and recommendations including suggestions for future research were the highlights of Chapter 6.

REFERENCES

ABDULLAH, F., WARD, R. & AHMED, E. 2016. Investigating the influence of the most commonly used external variables of TAM on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios. *Computers in Human Behavior*, 63: 75-90.

ABDULWAHAB, L. & DAHALIN, Z.M. 2010. A conceptual model of Unified Theory of Acceptance and Use of Technology (UTAUT) modification with management effectiveness and program effectiveness in context of telecentre. *African Scientist*, 11 (4), 267-275.

ABIDI, M. 2012. Retail disruption: how technology is influencing consumer buying habits. [Online]. Available at: https://www.theguardian.com/media-network/media-network-blog/2012/may/22/retail-technology-disruption-consumer-buying [Accessed on: 22 July 2019].

ABU-SHANAB, E. & GHALEB, O. 2012. Adoption of mobile commerce technology: an involvement of trust and risk concerns. *International Journal of Technology Diffusion (IJTD)*, 3 (2): 36-49.

ADJZEN, I. & FISHBEIN, M. 1980. *Understanding attitudes and predicting social behaviour*. Englewood Cliffs NJ: Pren-tice Hall.

AGARWAL, R. & PRASAD, J. 1998. The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems,* 22**:** 15-29.

AIKEN, K. D., & BOUSH, D. M. 2006. Trustmarks, objective-source ratings, and implied investments in advertising: Investigating online trust and the context-specific nature of Internet signals. *Journal of the Academy of Marketing Science*, 34 (3): 308-323.

AJIBOYE, J.O. & TELLA, A. 2007. University Undergraduate Students' Information Seeking Behaviour: Implications for Quality in Higher Education in Africa. *Turkish Online Journal of Educational Technology-TOJET*, 6 (1): 40-52.

AJZEN, I. & FISHBEIN, M. 1988. Theory of reasoned action-Theory of planned behaviour. *University of South Florida*, 67-98.

AJZEN, I. 1991. The Theory of Planned Behaviour. *Organizational Behaviour and Human Decision Processes,* 50: 179-211.

AJZEN, I.1985. *From intentions to actions: A theory of planned behaviour*. Springer Berlin Heidelberg.

AKINCI, S., AKSOY, S. & ATILGAN, E. 2004. Adoption of Internet banking among sophisticated consumer segments in an advanced developing country. *Internationa Journal of Bank Marketing* 22 (3): 212-232.

ALLEN, M. 2018. The Contribution of Information and Communication Technology to the wellbeing of the urban poor in South Africa. (PhD Thesis). University of Cape Town.

ALRAWIMI, A. A. 2015. 'Influence of Online Security, Protection, Website Credibility and Previous After Sales Experience on the Intention to Purchase Online'. *European Journal of Business and Innovation Research,* 3 (2): 1-10.

ALSAAD, A., MOHAMAD, R. & ISMAIL, N.A. 2017. The moderating role of trust in business to business electronic commerce (B2B EC) adoption. *Computers in Human Behavior*, 68: 157-169.

ALSHEIKH, L. & BOJEI, J. 2014. Determinants affecting customer's intention to adopt mobile banking in Saudi Arabia. *International Arab Journal of e-Technology*, 3 (4): 210-219.

ANDROULIDAKIS, I. & KANDUS, G. 2011. Mobile phone downloading among students: The status and its effect on security. In *2011 10th International Conference on Mobile Business* (pp. 235-242), June 2011. IEEE.

ANJANA, S.S. 2018. A study on factors influencing cosmetic buying behavior of consumers. *International Journal of Pure and Applied Mathematics*, 118 (9): 453-459.

ANSWERSAFRICA. 2019. Growth and impact of mobile technology in Africa. [Online]. Available at: https://answersafrica.com/growth-and-impact-of-mobile-technology-in-africa.html [Accessed on: 09 October 2019].

ANUSHA, G. 2016. Effectiveness of online advertising. *International Journal of Research*, *4*(3): 14-21.

APPLEGATE, L.M., AUSTIN, R.D. & MCFARLAN, F.W. 2006. *Corporate information strategy* and *management*. McGraw-Hill/Irwin Custom Publishing.

ARMSTRONG, G.M., KOTLER, P., HARKER, M. AND BRENNAN, R. 2018. *Marketing: an introduction*. Pearson UK.

ARNOLD, A. 2017. Why YouTube Stars Influence Millennials More Than Traditional Celebrities. [Online]. Available at: https://www.forbes.com/sites/under30network/2017/06/20/why-youtube-stars-influence-millennials-more-than-traditional-celebrities/#52a7089648c6 [Accessed on: 11 October 2019].

ARTS, J.W., FRAMBACH, R.T. AND BIJMOLT, T.H. 2011. Generalizations on consumer innovation adoption: A meta-analysis on drivers of intention and behavior. *International Journal of Research in Marketing*, 28 (2): 134-144.

ASHRAF, R. & MERUNKA, D. 2017. The use and misuse of student samples: An empirical investigation of European marketing research. *Journal of Consumer Behaviour*, 16 (4): 295-308.

AWAD, N.F. & RAGOWSKY, A. 2008. Establishing trust in electronic commerce through online word of mouth: An examination across genders. *Journal of Management Information Systems*, 24: (4): 101-121.

BABAKUS, E., EROGLU, S. & YAVAS, U. 2004. Modeling consumers' choice behavior: an application in banking. *Journal of Services Marketing*, 18 (6): 462-470.

BAE, S. & LEE, T., 2011. Gender differences in consumers' perception of online consumer reviews. *Electronic Commerce Research*, 11 (2): 201-214.

BAIG, M.M., GHOLAMHOSSEINI, H. & CONNOLLY, M.J. 2015. Mobile healthcare applications: system design review, critical issues and challenges. *Australasian physical & engineering sciences in medicine*, 38 (1): 23-38.

BAILEY, T., DEL MIGLIO, A. & RICHTER, W. 2014. The rising strategic risks of cyberattacks. *McKinsey Quartely*.

BAKER, M. J. 1994. *Marketing: An Introductory Text* 5th Edition; London. The Macmillan Press Ltd.

BAKER, M.J. & FOY, A. 2003. *Business and management research: How to complete your* research *project successfully.* West-burn publishers Ltd, Scotland.

BANKOLE, O.M. & OLUDAYO, B.S. 2012. Internet Use Among Undergraduate Students of Olabisi Onabanjo University, Ago Iwoye, Nigeria. *Library Philosophy and Practice*, 812.

BAPTISTA, G. & OLIVEIRA, T. 2015. Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, 50: 418-430.

BARON, R.M. & KENNY, D.A. 1986. 'The mediator-moderator variable distinction in social psychological research: conceptual, strategic, and statistical considerations'. *Journal of Personality and Social Psychology*, 51 (6), 1173-82.

BARRANTES, R. 2007. Analysis of ICT demand: what is digital poverty and how to measure it?. *Digital Poverty: Latin American and Caribbean Perspectives*, 29-53.

BARTH, B. 2018. Assault and battery: Malvertising campaign checks user devices' charge as anti-detection technique. [Online]. Available at: https://www.scmagazine.com/home/security-news/assault-and-battery-malvertising-campaign-checks-user-device-charge-as-anti-detection-technique/ [Accessed on: 23 March 2018].

BARUTÇU, S. 2007. Attitudes towards mobile marketing tools: A study of Turkish consumers, Journal of Targeting. *Measurement and Analysis for Marketing,* 16 (1): 26–38.

BARWISE, P. & STRONG, C. 2002. Permission-based mobile advertising. *Journal of interactive Marketing*, 16 (1), 14-24.

BATYA, F., KAHN, P.H. & HOWE, D.C. 2000. Trust online. *Communications of the ACM*, 43 (12): 34-40.

BAUER, H.H., BARNES, S., NEUMANN, M.M. & REICHARDT, T. 2005. Driving consumer acceptance of mobile marketing: A theoretical framework and empirical study. *Journal of Electronic Commerce Research*. 6 (3): 181-192.

BELL, E. AND BRYMAN, A. 2007. The ethics of management research: an exploratory content analysis. *British journal of management*, 18 (1): 63-77.

BENADY, D. 2014. Brands, technology, and the changing face of retail. *The Guardian*.

BENEKE, J., CUMMING, G., STEVENS, A. & VERSFELD, M. 2010. Influences on attitude toward mobile text message advertisements: An investigation of South African youth. *International Journal of Mobile Marketing*, 5 (1).

BENEKE, J.H. 2011. Towards an understanding of the youth's perception of, and response to, mobile advertising in an emerging market: an exploratory study. *International Journal of* management *and Technology*, 1, (1): 19-21.

BENLIAN, A., TITAH, R. & HESS, T. 2012. Differential effects of provider recommendations and consumer reviews in e-commerce transactions: An experimental study. *Journal of Management Information Systems*, 29 (1): 237-272.

BENSON, V., SARIDAKIS, G., TENNAKOON, H. & EZINGEARD, J.N. 2015. The role of security notices and online consumer behaviour: An empirical study of social networking users. *International Journal of Human-Computer Studies*, *80*: 36-44.

BERGER, S. 2009. Self-service technology for sales purposes in branch banking: The impact of personality and relationship on customer adoption. *International Journal of Bank Marketing,* 27 (7): 488-505.

BERTOT, J.C., JAEGER, P.T. & GRIMES, J.M. 2010. Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government information quarterly*, 27, (3): 264-271.

BERUBE, M. 2018. Students fall victim to email scams. The Gate Post. [Online]. Available at: http://fsugatepost.com/2018/10/26/students-fall-victim-to-email-scams/ [Accessed on: 14 July 2019].

BHASIN, M.L. 2012. Online Privacy Protection: Privacy Seals and Government Regulations in Select Countries. *International Journal of Finance and Accounting*, 1 (6): 148-161.

BHATIASEVI, V. 2016. An extended UTAUT model to explain the adoption of mobile banking. *Information Development*, 32 (4): 799-814.

BHATIASEVI, V., & YOOPETCH, C. 2015. The determinants of intention to use electronic booking among young users in Thailand. *Journal of Hospitality and Tourism Management*, 23, 1-11.

BHATNAGAR, A., MISRA, S. & RAO, H.R. 2000. 'On risk, convenience and the Internet shopping'. *Association for Computer Machinery. Communications of the ACM*, 43 (11): 98-105.

BLACKWELL, R.D., MINIARD, P. & ENGEL, J. 2006. *Consumer behaviour, (International* student *edition)*. Thomson Higher Education, Mason, OH.

BLEIER, A., GOLDFARB, A. & TUCKERC, C. 2020. Consumer privacy and the future of data-based innovation and marketing. *International Journal of Research in Marketing*.

BLOOMBERG. 2018. The Big Hack: How China Used a Tiny Chip to Infiltrate U.S. Companies. [Online]. Available at: https://www.bloomberg.com/news/features/2018-10-04/the-big-hack-how-china-used-a-tiny-chip-to-infiltrate-america-s-top-companies [Accessed on: 22 February 2019].

BLUMBERG, B., COOPER, D. & SCHINDLER, P. 2011. *Business Research Methods*. McGraw-Hill Education.

BLUMBERG, B., COOPER, D.R. & SCHINDLER, P. 2008. *Business research methods* (Vol. 2). London: McGraw-Hill Higher Education.

BOERMAN, S.C., WILLEMSEN, L.M. & VAN DER AA, E.P. 2017. 'This post is sponsored': Effects of sponsorship disclosure on persuasion knowledge and electronic word of mouth in the context of Facebook. *Journal of Interactive Marketing*, 38: 82-92.

Botha, J., Grobler, M.M., Hahn, J. & Eloff, M. 2017. A high-level comparison between the South African protection of personal information act and international data protection laws. In *International Conference on Cyber Warfare and Security Conference Proceedings* (p. 57).

BRANCO, F., SUN, M. & VILLAS-BOAS, J.M. 2015. Too much information? Information provision and search costs. *Marketing Science*, 35 (4): 605-618.

BRIGGS, N. E. & MACCALLUM, R. C. 2003. Recovery of weak common factors by maximum likelihood and ordinary least squares estimation. *Multivariate Behavioral Research*, 38, (1): 25-56.

BRIGHT, L.F. & DAUGHERTY, T. 2012. Does customization impact advertising effectiveness? An exploratory study of consumer perceptions of advertising in customized online environments. *Journal of Marketing Communications*, 18 (1): 19-37.

BRYMAN, A. 2008*. Social research methods*, 4th edition. Oxford, Oxford University Press.

BURKUS, D. 2013. The 5 Common Characteristics of Ideas That Spread. [Online]. Available at: https://99u.adobe.com/articles/19306/the-5-common-characteristics-of-ideas-that-spread [Accessed on: 7 November 2019].

BUSINESS WEEK. 2000. 'Business week/Harris poll: a growing threat', Business Week. [Online]. Available at: www.businessweek.com/2000/0012b3673010.htm [Available at: 18 February 2019].

BUSINESSTECH. 2017. The state of South Africa's mobile market vs the rest of Africa. Online. https://businesstech.co.za/news/mobile/184693/the-state-of-south-africas-mobile-market-vs-the-rest-of-africa/ [Accessed on 14 August 2018].

CALDER, B.J., PHILLIPS, L.W. & TYBOUT, A.M. 1981. Designing Research for Application. *Journal of Consumer Research,* 8 (2): 197-207.

CALISIR, F. & GUMUSSOY, C.A. 2008. Internet banking versus other banking channels: Young consumers' view. *International Journal of Information Management,* 28: 215-221.

CAMERON, J. 2017. SA companies highly vulnerable to cyber-attacks, warns Africa expert. Where are your weaknesses? [Online]. Available at: https://www.biznews.com/africa/2017/03/01/cyber-attacks-africa [Accessed on: 15 April 2019].

CANTALLOPS, A.S. & SALVI, F. 2014. New consumer behavior: A review of research on eWOM and hotels. *International Journal of Hospitality Management*, 36: 41-51.

CARLEY-BAXTER, L.R., HILL, C.A., ROE, D.J., TWIDDY, S.E., BAXTER, R.K. & RUPPENKAMP, J. 2009. 'Does Response Rate Matter? Journal Editors Use of Survey Quality Measures in Manuscript Publication Decisions. *Survey Practice*, 2 (7): 1-11.

CARSON, D., GILMORE, A., PERRY, C. & GRONHAUG, K. 2001. *Qualitative Marketing* Research. London: Sage.

CASTRONOVO, C. & HUANG, L. 2012. Social media in an alternative marketing communication model. *Journal of Marketing Development and Competitiveness*, 6, (1): 117.
ÇELTEK, E., 2010. Mobile advergames in tourism marketing. *Journal of Vacation Marketing*, 16 (4): 267-281.

CHANG, M.K., CHEUNG, W. & TANG, M. 2013. Building trust online: Interactions among trust building mechanisms. *Information & Management*, 50 (7): 439-445.

CHAU, N.T., DENG, H. & TAY, R. 2020. Critical determinants for mobile commerce adoption in Vietnamese small and medium-sized enterprises. *Journal of Marketing Management*, 1-32.

CHEE, S.W., YEE, W.K. & SAUDI, M.H.M. 2018. Consumer Perceptions and Intentions Towards Malaysian Mobile Marketing. *Asian Journal of Innovation & Policy*, 7 (2).

CHELLAPPA, R.K. & PAVLOU, P.A. 2002. Perceived information security, financial liability, and consumer trust in electronic commerce transactions. *Logistics Information Management*, 15, (5), 358-368.

CHEN, J.Q., ZHANG, R. & LEE, J. 2013. A cross-culture empirical study of M-Commerce privacy concerns. *Journal of Internet Commerce*, 12 (4): 348-364.

CHEON, J., LEE, S., CROOKS, S.M. & SONG, J. 2012. An investigation of mobile learning readiness in higher education based on the theory of planned behaviour. *Computers & Education*, 59, (3): 1054-1064.

CHIABURU, D. S., & BYRNE, Z. S. 2009. Predicting OCB role definitions: Exchanges with the organization and psychological attachment. *Journal of Business and Psychology,* 24: 201–214.

CHIEMEKE, S.C. & EVWIEKPAEFE, A.E. 2011. A conceptual framework of a modified unified theory of acceptance and use of technology (UTAUT) Model with Nigerian factors in E-commerce adoption. *Educational Research*, 2, (12): 1719-1726.

CHIGONA, W., KANKWENDA, G. & MANJOO, S. 2008. The uses and gratifications of mobile Internet among the South African students. In *PICMET'08-2008 Portland International Conference on Management of Engineering & Technology* (pp. 2197-2207), July 2008. IEEE.

CHIKURUNHE, R., KADYAMATIMBA, A. & MUNYOKA, W. 2018. An Assessment of Information Systems Security Management at University of Venda and its Impact to the University Community. *Asian Journal of Information Technology*, 17 (2): 142-152.

CHINOMONA, R. & SANDADA, M. 2013. The influence of market related mobile activities on the acceptance of mobile marketing and consumer intention to purchase products promoted by SMS in South Africa. *Journal of Applied Business Research (JABR)*, 29 (6): 1897-1908.

CHO, H., LEE, J.S. & CHUNG, S. 2010. Optimistic bias about online privacy risks: Testing the moderating effects of perceived controllability and prior experience. *Computers in Human Behavior*, 26 (5): 987-995.

CHONG, A.Y.L. 2013. Predicting m-Commerce adoption determinants: A neural network approach. *Expert Systems with Applications*, 40 (2): 523-530.

CHONG, A.Y.L., CHAN, F.T. & OOI, K.B. 2012. Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia. *Decision Support Systems*, 53 (1): 34-43.

CHONG, N. 2018. Maple Change Crypto Exchange Hacked For Bitcoin (BTC). [Online]. Available at: MapleChange Crypto Exchange Hacked For Bitcoin (BTC). Available at: https://ethereumworldnews.com/maplechange-crypto-exchange-hacked-for-913-bitcoin-btc-exit-scam-likely/ [Accessed on: 12 January 2019].

CHOWDHURY, H.K., PARVIN, N., WEITENBERNER, C. & BECKER, M. 2006. Consumer attitude toward mobile advertising in an emerging market: An empirical study. *International Journal of Mobile Marketing*, 1, (2): 33-41.

CHU, S. & KIM. Y. 2011. Determinants of consumer engagement in electronic word-of-mouth (eWOM) in social networking sites. *International Journal of Advertising*, 30, (1): 47-75.

CHURCHILL, A. G. 1995. *Marketing research methodological foundations,* 6th ed. Fort Worth: Dryden Press.

CIGANEK, A. P. & JARAPATRUIN, S. 2004. 'The Role of National Culture and Gender on Information Elements in E-Commerce: A Pilot Study on Trust'. *Proceedings of the Tenth Americas Conference on Information Systems*, August 2004. New York.

CIMPANU, C. 2018. Hackers breach web hosting provider for the second time in the past year. [Online]. Available at: https://www.zdnet.com/article/hackers-breach-web-hosting-provider-for-the-second-time-in-the-past-year/ [Accessed on: 23 March 2019].

COHEN, J. 1988. *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

COHEN, L., MANION, L. & MORRISON, K. 2002. *Research methods in education*. Routledge.
CONRAY-MURRAY, A. 2003. Strategies & issues: justifying security spending. [Online]. Available at: http://www.itarchitect.com/articles/NMG20020930S0002.html [Accessed on 23 July 2019].

CONSTANTINIDES, E. 2004. Influencing the online consumer's behavior: the Web experience. *Internet research*, 14 (2): 111-126.

CORBITSO, K., ASH, T. & PISONE, N. 2011. Combining the benefits of traditional commerce and E-commerce with M-Commerce benefits in the retail industry. (Bachelor dissertation). Mälardalen University.

CORDESMAN, A.H. & CORDESMAN, J.G. 2002. *Cyber-threats, information warfare, and critical infrastructure protection: defending the US homeland*. Greenwood Publishing Group.

CORESH, J., ASTOR, B.C., GREENE, T., EKNOYAN, G. & LEVEY, A.S., 2003. Prevalence of chronic kidney disease and decreased kidney function in the adult US population: Third National Health and Nutrition Examination Survey. *American journal of kidney diseases*, 41 (1): 1-12.

COSTELLO, A. B. & OSBORNE, J. W. 2005. Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical assessment, research &* evaluation, 10, (7): 1-9.

COURSARIS, C., HASSANEIN, K. & HEAD, M. 2003. M-commerce in Canada: an interaction framework for wireless privacy. *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration*, 20 (1): 54-73.

CRESWELL, J.W. 2003. A framework for design. *Research design: Qualitative, quantitative, and* mixed *methods approaches*, 9-11.

CUADRADO, F. & DUENAS, J.C. 2012. Mobile application stores: success factors, existing approaches, and future developments. *IEEE Communications Magazine*, 50, (11): 160-167.

CULLEN, M. & KABANDA, S.K. 2018. The role of demographic and motivational factors on mobile commerce usage activities in South Africa. *South African Journal of Information Management*, 20 (1): 1-8.

CUNEYT, K. & GAUTAM, B. 2004. The impacts of quickness, price, payment risk, and delivery issues on on-line shopping, *Journal of Socio-Economics*, 33: 241–251.

CURLING, R. 2018. SA's mobile phone evolution: what's still to come. [Online]. Available at: https://www.itweb.co.za/content/DZQ58vVJpPXvzXy2. [Accesssed on: 09 October 2019].

CWELE, S.C. 2014. Minister of State Security, Republic of South Africa Cyber Security Meeting, Johannesburg. [Online]. Available at: http://www.ssa.gov.za/Portals/0/SSA%20docs/Speeches/2014/Minister%20Cwele%20Cyber%20Security%2027%20March%202014.pdf [Accessed on: 19 November 2010].

CYBINT CYBER SOLUTION. 2018. 13 Alarming Cyber Security Stats. [Online]. Available at: https://www.cybintsolutions.com/cyber-security-facts-stats/ [Accessed on: 12 June 2019].

D'ESTE, P., IAMMARINO, S., SAVONA, M. & VON TUNZELMANN, N. 2012. What hampers innovation? Revealed barriers versus deterring barriers. *Research policy*, 41 (2): 482-488.

DABHOLKAR, P.A. & BAGOZZI, R.P. 2002. An attitudinal model of technology-based self-service: moderating effects of consumer traits and situational factors. *Journal of the academy of marketing science*, 30 (3): 184-201.

DAS, A. & KHAN, H.U. 2016. Security behaviors of smartphone users. *Information & Computer Security*, 24 (1):116-134.

DAVIS, D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly,* 13, (3): 319-340.

Davis, J. 2019. Social Media Gives Consumers and Brands a Direct Connection. [Online]. Available at: https://ducttapemarketing.com/empowerment-social-media/ [Accessed on 19 November 2019].

DAVIS, R., SAJTOS, L. & CHAUDHRI, A.A. 2011. Do consumers trust mobile service advertising?. *Contemporary Management Research*, 7 (4).

DAWSON, J.F. 2014. Moderation in management research: What, why, when, and how. *Journal of Business and Psychology*, 29 (1): 1-19.

DE MAREZ, L., VYNCKE, P., BERTE, K., SCHUURMAN, D. & DE MOOR, K. 2007. Adopter segments, adoption determinants and mobile marketing. *Journal of Targeting, Measurement and* Analysis *for Marketing*, 16, (1): 78-95.

DE PELSMACKER, P., VAN TILBURG, S. & HOLTHOF, C. 2018. Digital marketing strategies, online reviews and hotel performance. *International Journal of Hospitality Management*, 72: 47-55.

DELAFROOZ, N., PAIM, L.H., HARON, S.A., SIDIN, S.M. & KHATIBI, A. 2009. Factors affecting students attitude toward online shopping. *African Journal of Business Management*, 3 (5): 200-209.

DELOITTE. 2013. Deloitee forecasts a big year for mobile in South Africa. [Online]. Available at: http://businesstech.co.za/news/mobile/31978/ [Accessed on: 11 September 2019].

DELOITTE. 2015. African Powers of Retailing New horizons for growth. [Online]. Available at: https://www2.deloitte.com/content/dam/Deloitte/ng/Documents/consumer-business/ng-african-powers-of-retailing-new-horizons-for-growth.pdf [Accessed on 16 October 2019].

DEMIR, A. 2013. Factors effecting Turkish customers' mobile marketing services adoption (Master's Thesis). Bahcesehir University.

DESHMUKH, S.P., DESHMUKH, P. & THAMPI, G.T. 2013. Transformation from E-commerce to M-Commerce in Indian Context. *International Journal of Computer Science Issues (IJCSI)*, 10 (4): 55.

DETLOR, B., SPROULE, S. & GUPTA, C. 2003. Pre-purchase online information seeking: Search versus browse. *J. Electron. Commerce Res.*, 4 (2): 72-84.

DEVLIN, J. & YEUNG, M. 2003. Insights into customer motivations for switching to Internet banking. *The International Review of Retail, Distribution, and Consumer Research,* 13 (4): 375-392.

DIAMANTOPOULOS, A. & SCHLEGELMICH, B.B. 2000. *Taking the Fear out of Data Analysis*. London, Cengage.

DICK, A.A. 2007. Market Size, Service Quality, and Competition in Banking. *Journal of Money,* Credit *and Banking,* 39 (1): 49-81.

DICKINGER, A., HAGHIRIAN, P., MURPHY, J. & SCHARL, A. 2004. An investigation and conceptual model of SMS marketing. *Proceedings of the 37th Annual Hawaii International Conference on System Sciences.* IEEE.

DILLON, A. 2001. *User acceptance of information technology*. London: Taylor and Francis.

DIN, N.M. 2020. Building A Trusted Environment For E-Business: A Malaysian Perspective. *Journal of Information and Communication Technology*, 1 (1): 33-44.

DIX, S., FERGUSON, G., IM, H. & HA, Y. 2012. Who are the users of mobile coupons? A profile of US consumers. *Journal of Research in Interactive Marketing*, 6 (3): 215-232.

DLAMINI, M.T., ELOFF, J.H. & ELOFF, M.M. 2009. Information security: The moving target. *Computers & security*, 28 (3-4): 189-198.

DONGA, G.T. 2017. Consumer acceptance of mobile marketing through mobile phones: a case study of South African University students. (Master's Thesis). University of Venda.

DOST, B., KHYZER, M. & REHMAN, C.A. 2016. Significance of knowledge management practices effecting supply chain performance. *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, 10 (3): 659-686.

DRENNAN, J. 2003. Cognitive interviewing: verbal data in the design and pretesting of questionnaires. *Journal of advanced nursing*, 42 (1): 57-63.

DU PLESSIS, P.J., ROUSSEAU, G.G., BOSHOFF, C., EHLERS, L., ENGELBRECT, M., JOUBERT, R. & SAUNDERS, S. 2010. *Buyer behaviour: Understanding consumer psychology and marketing*, 4th ed. Cape Town: Oxford University Press, 118.

Du, J., 2011. An empirical analysis of Internet banking adoption in New Zealand. (PhD Thesis). Lincoln University.

DU, T. & AGAMI, A. 2017. Examining young users' security perceptions of mobile banking: A qualitative study on users' insights about mobile banking.

EL-MAAMIRY, A.A., 2017. The information-seeking behaviour of students: A case of university of Dubai. *Global Journal of Computer Science and Technology*, 6 (3): 1-7.

EMARKETER REPORT. 2018. Worldwide Retail and Ecommerce Sales: eMarketer's Updated Forecast and New Mcommerce Estimates for 2016—2021. [Online]. Available at: https://www.emarketer.com/Report/Worldwide-Retail-Ecommerce-Sales-eMarketers-Updated-Forecast-New-Mcommerce-Estimates-20162021/2002182 [Accessed on: 24 April 2019].

ERIKSSON, D. 2019. The GDPR's lawful basis of legitimate interest: Advice and review regarding the balancing operation as of GDPR Article 6.1 (f).

ERNST & YOUNG GLOBAL LIMITED. 2015. The future of insurance in a digital world. [Online]. Availableon:https://www.ey.com/Publication/vwLUAssets/The_future_of_insurance_in_a_digital_world/$FILE/EY-future-of-in-a-digital-world-design-comments.pdf [Accessed on: 22 February 2019].

ETIM, A.S. 2014. Mobile banking and mobile money adoption for financial inclusion. *Research in Business and Economics Journal*, 9: 1.

ETZIONI, A. 2019. Cyber trust. *Journal of Business Ethics*, 156 (1): 1-13.

EWING, M.T. 2009. Integrated marketing communications measurement and evaluation. *Journal of Marketing Communications*, 15 (2-3): 103-117.

FANG, X., HU, P.J.H., LI, Z. & TSAI, W. 2013. Predicting adoption probabilities in social networks. *Information Systems Research*, 24 (1): 128-145.

FANO, A. & GERSHMAN, A. 2002. The future of business services in the age of ubiquitous computing. *Communications of the ACM*, 45 (12): 83-87.

FAQIH, K.M. & JARADAT, M.I.R.M. 2015. Assessing the moderating effect of gender differences and individualism-collectivism at individual-level on the adoption of mobile commerce technology: TAM3 perspective. *Journal of Retailing and Consumer Services*, 22: 37-52.

FARQUHAR, J.D. & MEIDAN, A. 2010. *Marketing Financial Services, 2nd ed.* London, Palgrave MacMillan.

FAULKNER, K.T., BURNESS, A., BYRNE, M.J., KUMSCHICK, S., PETERS, K., ROBERTSON, M.P., SACCAGGI, D.L., WEYL, O.L. & WILLIAMS, V.L. 2020. South Africa's pathways of introduction and dispersal and how they have changed over time. In *Biological Invasions in South Africa* (pp. 313-354). Springer, Cham.

FIELD, A. 2009. *Discovering Statistics Using SPSS, 3rd Edition*. Thousand Oaks, CA, Sage.

FIELD, A. 2013. *Discovering statistics using IBM SPSS statistics*. sage.

FILIERI, R., 2016. What makes an online consumer review trustworthy?. *Annals of Tourism Research*, 58: 46-64.

FIN24TECH. 2016. 8.8 million South Africans hit by cyber-crime – study. [Online]. Available at: https://www.fin24.com/Tech/News/88-million-south-africans-hit-by-cyber-crime-study-20160707 [Accessed on: 11 February 2019].

FIORE, A.M., JIN, H.J. & KIM, J. 2005. For fun and profit: Hedonic value from image interactivity and responses toward an online store. *Psychology & Marketing*, 22 (8): 669-694.

FISHBEIN, M. & AJZEN, I. 1975. *Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research*. Reading, MA, Addison-Wesley.

FISHBEIN, M. 1979. *A theory of reasoned action: some applications and implications*. Lincoln: University of Nebraska Press.

FLIGHT, R.L., D'SOUZA, G. & ALLAWAY, A.W. 2011. Characteristics-based innovation adoption: scale and model validation. *Journal of product & brand management*, 20 (5): 343-355.

FOSNACHT, K., SARRAF, S., HOWE, E. & PECK, L.K. 2017. How important are high response rates for college surveys?. *The Review of Higher Education*, 40 (2): 245-265.
FRAZIER, P.A., TIX, A.P. & BARRON, K.E. 2004. Testing moderator and mediator effects in counseling psychology research. *Journal of counseling psychology*, 51 (1): 115.

GAO, T., ROHM, A. J., SULTAN, F. & HUANG S. 2012. Antecedents of Consumer Attitudes Toward Mobile Marketing: A Comparative Study of Youth Markets in the United States and China. *Thunderbird international Business Review*, 54 (2): 211-224.

GAO, T., SULTAN, F. & ROHM, A.J. 2010. Factors influencing Chinese youth consumers' acceptance of mobile marketing. *Journal of Consumer Marketing*, 27 (7): 574-583.

GARBA, A.B., ARMAREGO, J., MURRAY, D. & KENWORTHY, W. 2015. Review of the information security and privacy challenges in Bring Your Own Device (BYOD) environments. *Journal of Information privacy and security*, 11 (1): 38-54.

GATLAN, S. 2018. AirNaine Uses New ARS RAT Strain Named ZeroEvil Against Canadian Businesses. [Online]. Available at: https://news.softpedia.com/news/airnaine-uses-new-ars-rat-strain-named-zeroevil-against-canadian-businesses-523078.shtml [Accessed on: 29 November 2019].

GENİŞ GRUBER, A., GÖNÜL, M.S. & TAŞ, B.K.O. 2012. Obstacles to online shopping: Impact of gender and Internet security issues. [Online]. Available at: https://acikerisim.deu.edu.tr/xmlui/bitstream/handle/20.500.12397/1764/2.pdf?sequence=1&isAllowed=y [Accessed 10 October 2019].

GICHAMBA, A. & LUKANDU, I.A. 2012. A model for designing M-agriculture applications for dairy farming. *The African Journal of Information Systems*, 4 (4): 1.

GIOIA, D.A. & PITRE, E., 1990. Multiparadigm perspectives on theory building. *Academy of* management *review*, 15 (4): 584-602.

GITAU, L. & NZUKI, D.M. 2014. Analysis of determinants of m-Commerce adoption by online consumers. *International Journal of Business, Humanities and Technology,* 4 (3): 88-94.

GLOBAL ONLINE CONSUMER REPORT. 2017. The truth about online consumers. [Online]. Available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/01/the-truth-about-online-consumers.pdf [Accessed on 22 March 2018].

GONCALVES, G., OLIVEIRA, T. & CRUZ-JESUS, F. 2018. Understanding individual-level digital divide: Evidence of an African country. *Computers in Human Behavior*, 87: .276-291.

GONG, W. & LI, Z.G. 2008. 'Mobile youth in China: a cultural perspective and marketing implications', *International Journal of Electronic Business*, 6, (3): 261-81.

GORDON-LARSEN, P., NELSON, M.C. & POPKIN, B.M. 2004. Longitudinal physical activity and sedentary behavior trends: adolescence to adulthood. *American journal of preventive medicine*, 27 (4): 277-283.

GOVENDER, I. & SIHLALI, W. 2014. A study of mobile banking adoption among university students using an extended TAM. *Mediterranean journal of social sciences*, 5 (7):451.

GRANT, I. & O'DONOHOE, S. 2007. Why young consumers are not open to mobile marketing communication. *International journal of advertising*, 26 (2): 223-246.

GRIFFIN, A. AND VIEHLAND, D. 2011, August. Demographic factors in assessing perceived risk in online shopping. In *Proceedings of the 13th International Conference on Electronic Commerce* (p. 9). ACM.

GRIMMER, M., KILBURN, A.P. & MILES, M.P. 2016. The effect of purchase situation on realized pro-environmental consumer behavior. *Journal of Business Research*, 69 (5): 1582-1586.

GUBA, E.G. & LINCOLN, Y.S. 1994. Competing paradigms in qualitative research. *Handbook of* qualitative *research*, *2*(163-194), p.105.

GURURAJAN, R. 2002. New financial transaction security concerns in mobile commerce. (PhD Thesis). University of Southern Queensland.

HA, H.Y. 2004. Factors influencing consumer perceptions of brand trust online. *Journal of product & brand management*, 13 (5): 329-342.

HACKBUSTERS. 2018. IE: Cork local investigated over hacking of council's parking app. [Online]. Available at: https://www.hackbusters.com/news/stories/3804177-ie-cork-local-investigated-over-hacking-of-council-s-parking-app [Accessed on 23 0ctober 2018].

HAGHIRIAN, P., & INOUE, A. 2007. An advanced model of consumer attitudes toward advertising on the mobile Internet. *International Journal of Mobile Communications,* 5 (1) 48-67.

HAJLI, N. & LIN, X. 2016. Exploring the security of information sharing on social networking sites: The role of perceived control of information. *Journal of Business Ethics*, 133 (1): 111-123.

HAMAD, A.A.A., PETRI, I., REZGUI, Y. & KWAN, A. 2017. Towards the innovation of an integrated 'One-Stop-Shop'online services utility management: Exploring customer'technology acceptance. *Sustainable cities and society*, 34: 126-143.

HANEL, P.H. & VIONE, K.C. 2016. Do student samples provide an accurate estimate of the general public?. *PloS one*, 11 (12).

HAWKINS, D.J., BEST, R.G. & CONEY, K.A. 2000. *Consumer behaviour: Building Marketing Strategy*. Boston, Irwin McGraw Hill.

HAYASHI, F. 2012. Mobile payments: What's in it for consumers? *Economic Review-Federal Reserve Bank of Kansas City*, 1: 35.

HAYES, A. F. 2012. PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modelling [White paper]. [Online]. Available at: http://www.afhayes.com/ public/process2012.pdf [Accessed on 23 July 2018].

HAYES, A.F. 2017. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Publications.

HAYES, A.F., MONTOYA, A.K. & ROCKWOOD, N.J., 2017. The analysis of mechanisms and their contingencies: PROCESS versus structural equation modeling. *Australasian Marketing Journal (AMJ)*, 25 (1): 76-81.

HEALY, M. & PERRY, C. 2000. Comprehensive Criteria to judge Validity and Reliability of Qualitative Research within the Realism Paradigm. *Qualitative Market Research: An International* Journal*,* 3, (3): 118-126.

HEINONEN, K. & STRANDVIK, T. 2007. Consumer responsiveness to mobile marketing. *International Journal of Mobile Communications*, 5 (6): 603-617.

HEITZMAN, A. 2018. Marketing has changed more in the past couple years than it did in a decade before. Have you adapted? [Online]. Available at: https://www.inc.com/adam-heitzman/how-digital-marketing-transformed-the-consumer-buying-process.html [Available at: 12 October 2019].

HENRY, P.J. 2008. Student sampling as a theoretical problem. *Psychological Inquiry*, 19 (2): 114-126.

HIGGS, B. & POLONSKY, M.J. 2007. New media: embedding communications strategy in broader marketing strategy. (PhD Thesis). Victoria University.

HIGUERA, V. 2015. Advantages & disadvantages of traditional marketing. From: http://smallbusiness.chron.com/advantages-disadvantages-traditional-marketing-25573.html [Accessed 11 January 2015].

HOENIG, T.M. 1995. The evolution of the payments system: A US perspective. *Economic Review-Federal Reserve Bank of Kansas City*, 80: 5-5.

HOLDEN, R.J. & KARSH, B.T. 2010. The technology acceptance model: its past and its future in health care. *Journal of biomedical informatics*, 43, (1): 159-172.

HONG, S., THONG, J., MOON, J AND TAM, K., 2008. Understanding the behavior of mobile data services consumers. *Inf Syst Front,* 10: 431–445.

HOUGHTON, J. 2014. Tap into riches with mobile content marketing. [Online]. Available at: https://www.mobilecastmedia.com/2014/01/tap-into-riches-with-mobile-content-marketing/ [Accessed on: 11 October 2019].

HOWSOUTHAFRICA, 2018. Consumer Spending Trends In 2018. [Online]. Available at: https://howsouthafrica.com/consumer-spending-trends-2018/. [Accessed on 27 November 2019].

HOYER, W., MACINNIS, D. & PIETERS, R. 2016. *Consumer Behaviour*, 7th edn. Cengage Learning, Boston, USA.

HOYER, W.D & MCINNIS, D.J. 2001. *Consumer behaviour*. Boston, New York. Houghton Mifflin Company.

HSU, C.L., LU, H.P. & HSU, H.H. 2007. Adoption of the mobile Internet: An empirical study of multimedia message service (MMS). *Omega*, 35, (6): 715-726.

HU, X., WU, G., WU, Y. & ZHANG, H. 2010. The effects of Web assurance seals on consumers' initial trust in an online vendor: A functional perspective. *Decision support systems*, 48 (2): 407-418.

HUANG, R. Y. & SYMONDS, J. 2009. Mobile marketing evolution: Systematic literature review on multi-channel communication and multi-characteristics campaign. *Proceedings of the IEEE Enterprise Distributed Object Computing Conference Workshops and Short Papers,* 157-165.

HUBBARD, R. & ARMSTRONG, J.S. 1994. Replications and extensions in marketing: Rarely published but quite contrary. *International Journal of Research in Marketing*, 11 (3): 233-248.
HUGHES, A. 2018. *Market Driven Political Advertising: Social, Digital and Mobile Marketing*. Springer.

HUGHES, C., SWAMINATHAN, V. & BROOKS, G. 2019. Driving Brand Engagement Through Online Social Influencers: An Empirical Investigation of Sponsored Blogging Campaigns. *Journal of Marketing*, 83 (5), 78–96.

HUSSAIN, S., QAZI, S., AHMED, R.R., VVEINHARDT, J. & STREIMIKIENE, D. 2019. Innovative user engagement and playfulness on adoption intentions of technological products: evidence from SEM-based multivariate approach. *Economic research-Ekonomska istraživanja*, 32 (1): 555-577.

IBIDUNMOYE, W. 2018. Identification of Factors Influencing the Adoption of Mobile Payments: A qualitative research study on the Swish mPayment App. (Master's Thesis). Linnaeus University.

IKOJA-ODONGO, R. & MOSTERT, J. 2006. Information seeking behaviour: a conceptual framework. *South African Journal of Libraries and Information Science*, 72 (3): 145-158.

IMAI, K., KEELE, L., TINGLEY, D. & YAMAMOTO, T. 2010. Causal mediation analysis using R. In *Advances in social science research using R* (pp. 129-154). Springer, New York, NY.

INDAHINGWATI, A., LAUNTU, A., TAMSAH, H., FIRMAN, A., PUTRA, A.H.P.K. & ASWARI, A. 2019. How Digital Technology Driven Millennial Consumer Behaviour in Indonesia. *Journal of Distribution Science*, 17 (8): 25-34.

ISMAIL, M. & RAZAK, R.C. 2011. The determinant factors influencing young consumers' acceptance of mobile marketing in Malaysia. *African Journal of Business Management*, 5 (32): 12531-12542.

IT ONLINE. 2020. Pressure growing to protect customers' personal information. [Online]. Available at: https://it-online.co.za/2020/01/28/pressure-growing-to-protect-customers-personal-information/ [Accessed on: 14 May 2020].

IZQUIERDO-YUSTA, A., OLARTE-PASCUAL, C. & REINARES-LARA, E. 2015. Attitudes toward mobile advertising among users versus non-users of the mobile Internet. *Telematics and Informatics*, *32*(2), pp.355-366.

JACCARD, J. & TURRISI, R. 2003. *Interaction effects in multiple regression* (Vol. 72). Sage.

JACKSON, A. 2019. Should consumers be concerned about businesses trackinf data online? [Online]. Available at: http://inbound.business.wayne.edu/blog/should-consumers-be-concerned-about-businesses-tracking-data-online [Accessed on: 13 October 2019].

JACKSON, K., 2018. The key factors that influence the attitude and behaviour of young South African female consumers towards online clothes shopping: a Superbalist case study. (Honours dissertation). The Independent Institute of Education.

JACKSON, N. & CARTER, P. 1991. In defence of paradigm incommensurability. *Organization* Studies, 12, (1): 109-127.

JADHAV, V. & KHANNA, M. 2016. Factors influencing online buying behavior of college students: A qualitative analysis. *The Qualitative Report*, 21 (1): 1.

JARADAT, M.I.R.M. 2014. Understanding individuals' perceptions, determinants and the moderating effects of age and gender on the adoption of mobile learning: developing country perspective. *International Journal of Mobile Learning and Organisation*, 8 (3-4): 253-275.

JENYO GABRIEL, K. & SOYOYE KOLAPO, M. 2015. Online marketing and consumer purchase behaviour: a study of Nigerian firms. *British Journal of Marketing Studies*, 3 (7): 1-14.

JIH, W.J. 2007. Effects of consumer-perceived convenience on shopping intention in mobile commerce: an empirical study. *International Journal of E-Business Research (IJEBR)*, 3 (4): 33-48.

JO BLACK, N., LOCKETT, A., WINKLHOFER, H. & ENNEW, C. 2001. The adoption of Internet financial services: a qualitative study. *International Journal of Retail & Distribution Management*, 29, (8): 390-398.

JOACHIM, V., SPIETH, P. & HEIDENREICH, S. 2018. Active innovation resistance: An empirical study on functional and psychological barriers to innovation adoption in different contexts. *Industrial Marketing Management*, 71: 95-107.

JOEL, S. 2017. The 'Who, What, Where and How' of Updating Business Information Across the Web. [Online]. Available at: https://synup.com/blog/update-business-info-across-web/ [Accessed on: 24 October 2019].

JOHNSON, P.O. & FAY, L.C. 1950. The Johnson-Neyman technique, its theory, and application. *Psychometrika*, 15 (4): 349-367.

JOHNSON, V.L., KISER, A., WASHINGTON, R. & TORRES, R. 2018. Limitations to the rapid adoption of M-payment services: Understanding the impact of privacy risk on M-Payment services. *Computers in Human Behavior*, 79: 111-122.

JONES, S. 2008. *Internet goes to college: How students are living in the future with today's technology*. Diane Publishing.

JOUBERT, J. & VAN BELLE, J. 2013. The role of trust and risk in mobile commerce adoption within South Africa. *International Journal of Business, Humanities and Technology*, 3 (2): 27-38.

JUDD, T. & KENNEDY, G. 2010. A five-year study of on-campus Internet use by undergraduate biomedical students. *Computers & Education*, 55 (4): 1564-1571.

KABBAJ, M.W. 2018. The Major Factors That Contribute To E-Commerce Growth In The US And China: Analyses And Adoption By Morocco. (Bachelor's Dissertation). Salem State University.

KADER, S. & MINNAAR, A. 2015. Cybercrime investigations: cyber-processes for detecting of cybercriminal activities, cyber-intelligence, and evidence gathering. *Acta Criminologica: Southern African Journal of Criminology*, (5): 67-81.

KAHTTAB, S.A., AL-MANASRA, E.A., ZAID, M.K.S.A. & QUTAISHAT, F.T. 2012. Individualist, collectivist, and gender moderated differences toward online purchase intentions in Jordan. *International Business Research*, 5 (8): 85.

KAPLAN, A. M. 2012. If you love something, let it go mobile: Mobile marketing and mobile social media 4x4. *Business Horizons,* 55*, 2*: 129-139.

KAPOOR, K., DWIVEDI, Y.K. & WILLIAMS, M.D. 2013. Role of innovation attributes in explaining the adoption intention for the interbank mobile payment service in an Indian context. In *International Working Conference on Transfer and Diffusion of IT* (pp. 203-220), June 2013. Springer, Berlin, Heidelberg.

KARAM, L. 2017. M-Commerce's increased importance. [Online]. Available at: https://apiumhub.com/tech-blog-barcelona/m-Commerce-growth/ [Accessed on: 22 February 2019].

KARDES, F.R. 2002. *Consumer Behaviour and Managerial Decision - Making* 2ndEdition. India: Prentice - Hall.

KARJALUOTO, H. & HUHTAMAEKI, M. 2010. The role of electronic channels in micro-sized brick-and-mortar firms. *Journal of Small Business and Entrepreneurship,* 23, (1): 17–38.

KATZ, E. & BLUMLER, J.G. 1974. *The uses of mass communications: Current perspectives on gratifications research*. Sage Publications.

KATZ, E., BLUMLER, J.G. & GUREVITCH, M. 1973. Uses and gratifications research. *The Public Opinion Quarterly*, 37, (4): 509-523.

KERA, M. 2017. The mobile app security risk is growing. [Online]. Available at: https://www.mobilepaymentstoday.com/articles/the-mobile-app-security-risk-is-growing/ [Accessed on: 13 March 2018].

KERKHOF, P. & VAN NOORT, G. 2010. Third party Internet seals: reviewing the effects on online consumer trust. In *Encyclopedia of e-business development and management in the global economy* (pp. 701-708). IGI Global.

KHAN, H., TALIB, F. & FAISAL, M.N. 2015. An analysis of the barriers to the proliferation of M-Commerce in Qatar: A relationship modeling approach. *Journal of Systems and Information Technology*, 17 (1): 54-81.

KHAN, I.U., HAMEED, Z. & KHAN, S.U. 2017. Understanding online banking adoption in a developing country: UTAUT2 with cultural moderators. *Journal of Global Information Management (JGIM)*, 25 (1): 3-65.

KIM, C., TAO, W., SHIN, N. & KIM, K.S. 2010. An empirical study of customers' perceptions of security and trust in e-payment systems. *Electronic commerce research and applications*, 9 (1): 84-95.

KIM, D.J., FERRIN, D.L. & RAO, H.R. 2008. A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision support* systems, 44 (2): 544-564.

KIM, J. & LEE, H.H. 2008. Consumer product search and purchase behaviour using various retail channels: the role of perceived retail usefulness. *International Journal of Consumer Studies*, 32 (6): 619-627.

KIM, S.H. 2008. Moderating effects of job relevance and experience on mobile wireless technology acceptance: Adoption of a smartphone by individuals. *Information & Management*, 45, (6): 387-393.

KINGSNORTH, S. 2019. *Digital marketing strategy: an integrated approach to online marketing*. Kogan Page Publishers.

KIRIAKIDIS, S. 2017. Perceived behavioural control in the theory of planned behaviour: variability of conceptualization and operationalization and implications for measurement. In *Strategic Innovative Marketing* (pp. 197-202). Springer, Cham.

KIRIRO, W. 2015. The Effect of Adoption of Electronic Marketing Practices on Organisational Performance of the Mobile Telephony Companies in Kenya. (MBA Thesis*).* University of Nairobi.

KOKOLAKIS, S. 2015. *Privacy attitudes and privacy behavior: A review of current research on the privacy paradox phenomenon*. Department of information and communications systems

engineering. [Online]. Available at: https://www.researchgate.net/profile/Spyros [Accessed on 14 November 2019].

KORGAONKAR, P. AND WOLIN, L.D. 2002. Web usage, advertising, and shopping: relationship patterns. *Internet Research*, 12 (2): 191-204.

KOTLER, P. & ARMSTRONG, G. 2012. *Principles of Marketing*. *New Jersey*.

KOTLER, P. & KELLER, K. L. 2012. *A Framwework for Marketing Management*. 5th edition. Pearson Education.

KOTLER, P. 2012. *Kotler on marketing*. Simon and Schuster.

KOTLER, P., BURTON, S., DEANS, K., BROWN, L. & ARMSTRONG, G. 2015. *Marketing*. Pearson Higher Education AU.

KRISTENSSON, P., GUSTAFSSON, A. & ARCHER, T. 2004. Harnessing the Creative Potential among Users. *Journal of Product Innovation Management*, 21: 4–14.

KRUM, C. 2010. *Mobile marketing: Finding your customers no matter where they are*. Pearson Education.

KUMAR, A., BEZAWADA, R., RISHIKA, R., JANAKIRAMAN, R. & KANNAN, P.K. 2016. From social to sale: The effects of firm-generated content in social media on customer behavior. *Journal of Marketing*, 80 (1): 7-25.

KUMAR, R. 2013. Respondent selection methods in household surveys. [Online]. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2392928 [Accessed on: 22 August 2019].

KURKOVSKY, S. 2007. Mobile Commerce Technologies. *5th International Conference on Information and Communication Technology*, December 2007, Cairo, Egypt.

LABAY, D.G. & KINNEAR, T.C. 1981. Exploring the Consumer Decision Process in the Adoption of Solar Energy Systems. *Journal of Consumer Research*, 8, (3), 271–278.

LAI, P.C. 2016. Design and Security impact on consumers' intention to use single platform E-payment. *Interdisciplinary Information Sciences*, 22 (1): 111-122.
LAM, K.Y., CHUNG, S.L., GU, M. & SUN, J.G. 2003. Lightweight security for mobile commerce transactions. *Computer Communications*, 26 (18): 2052-2060.

LAROSE, R., & RIFON, N. J. 2006. Your privacy is assured - of being disturbed: websites with and without privacy seals. New Media & Society, 8 (6): 1009-1029.

LATTO, J. 2014. Mobile Marketing & its Implements. (Bachelors dissertation). University of Jyvaskyla.

LAUDON, K. C., & TRAVER, C. G. 2017. *E-commerce: business, technology, society* (Thirteenth ed.). Boston, MA: Pearson.

LAUKKANEN, T. & PASANEN, M., 2008. Mobile banking innovators and early adopters: How they differ from other online users? *Journal of Financial Services Marketing*, 13 (2): 86-94.

LEAL-RODRÍGUEZ, A.L., ELDRIDGE, S., ROLDÁN, J.L., LEAL-MILLÁN, A.G. AND ORTEGA-GUTIÉRREZ, J. 2015. Organizational unlearning, innovation outcomes, and performance: The moderating effect of firm size. *Journal of Business Research*, 68 (4): 803-809.

LEE, S.Y., 2014. Examining the factors that influence early adopters' smartphone adoption: The case of college students. *Telematics and Informatics*, 31: (2): 308-318.

LEE, Y., KOZAR, K.A. & LARSEN, K.R. 2003. The technology acceptance model: Past, present, and future. *Communications of the Association for information systems*, 12, (1): 50.

LEE, Y.H., HSIEH, Y.C. & HSU, C.N. 2011. Adding innovation diffusion theory to the technology acceptance model: Supporting employees' intentions to use e-learning systems. *Educational Technology & Society*, 14, (4): 124-137.

LEPPÄNIEMI, M., SINISALO, J. & KARJALUOTO, H. 2006. 'A Review of Mobile Marketing Research'. *International Journal of Mobile Marketing*, 1, (1): 2–12.

LEVIN, D. & ARAFEH, S. 2002. *The digital disconnect: The widening gap between Internet-savvy students and their schools*. American Institutes for Research, Washington, DC.

LICHTENSTEIN, S. & WILLIAMSON, K. 2006. Understanding Consumer Adoption of Internet Banking: An Interpretive Study in the Australian Banking Context. *Journal of Electronic Commerce Research*, 7 (2): 50-66.

LIN, H.F., 2011. An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International journal of information management*, 31 (3), 252-260.

LIN, X., LI, Y., CALIFF, C.B. & FEATHERMAN, M. 2013, January. Can social role theory explain gender differences in Facebook usage? In *2013 46th Hawaii International Conference on System Sciences* (pp. 690-699). IEEE.

LINCK, K., POUSTTCHI, K. & WIEDEMANN, D.G. 2006. Security issues in mobile payment from the customer viewpoint. *European Conference on Information Systems (ECIS)*, Göteborg/Schweden, June 2006: 1-11.

LINDELL, M. K. & WHITNEY, D. J. 2001. Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology,* 86, (1): 114-121.

LIU, C. & ARNETT, K.P. 2000. Exploring the factors associated with Web site success in the context of electronic commerce. *Information & management*, 38 (1): 23-33.

LIU, C., SINKOVICS, R., PEZDERKAB, N. & HAGHIRIANC, P. 2011. Determinants of Consumer Perceptions toward Mobile Advertising — A Comparison between Japan and Austria. *Journal of Interactive Marketing*, 26: 21–32.

LOESCHE, D. Mobile E-commerce is up and Poised for Further Growth. [Online]. Available at: https://www.statista.com/chart/13139/estimated-worldwide-mobile-e-commerce-sales/ [Accessed on: 22 February 2019].

LOUDON, D.L. & BITTA, A.J.D. 1993. *Consumer behaviour*. 4th Edi. New York. McGraw Hill.

LOUW, C. & VON SOLMS, B. 2018. Smartphone Usage and Security Maturity: A South African Student Evaluation. In *European Conference on Cyber Warfare and Security* (pp. 268-XVI), June 2018. Academic Conferences International Limited.

LU, J., YAO, J.E. & YU, C.S. 2005. Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *The Journal of Strategic Information Systems*, 14 (3): 245-268.

LUARN, P. & LIN, H.H. 2005. Toward an understanding of the behavioral intention to use mobile banking. *Computers in human behavior*, 21 (6): 873-891.

MACDERMOTT, J. 2015. How Has the Internet Changed Consumer Purchasing Behaviour? [Online]. Available at: http://www.nextmarketing.com.au/2015/07/how-has-the-Internet-changed-consumer-purchasing-behaviour/ [Accessed on: 21 October 2019].

MAHAN, J.E. & MCDANIEL, S.R. 2006. The new online arena: Sport, marketing, and media converge in cyberspace. *Handbook of sports and media*, 409-431.

MAHMOOD, T. & AFZAL, U. 2013. Security analytics: Big data analytics for cybersecurity: A review of trends, techniques, and tools. In *2013 2nd national conference on Information assurance (ncia)*, December 2013: 129-134. IEEE.

MAI, J.E. 2016. *Looking for information: A survey of research on information seeking, needs, and behavior*. Emerald Group Publishing.

MAITY, M. & DASS, M. 2014. Consumer decision-making across modern and traditional channels: E-commerce, m-Commerce, in-store. *Decision Support Systems*, 61: 34-46.

MAKHITHA, M. & DLODLO, N. 2014. Examining Salient Dimensions of Online Shopping and the Moderating Influence of Gender: The Case of Students at a South African University. *Mediterranean Journal of Social Sciences*, 5, (23): 1838.

MALHOLTRA, N. 2010. *Marketing Research: An Applied Orientation, 6th Edition*. Upper Saddle River, NJ, Pearson.

MALHOTRA, N.K. 2015. *Marketing research*. Pearson Higher Ed.

MALLAT, N. 2007. Exploring consumer adoption of mobile payments–A qualitative study. *The Journal of Strategic Information Systems*, 16 (4): 413-432.

MANGOLD, W.G. & FAULDS, D.J. 2009. Social media: The new hybrid element of the promotion mix. *Business horizons*, 52 (4): 357-365.

MARKETO .2019. Mobile marketing. [Online]. Available at: https://www.marketo.com/mobile-marketing/ [Accessed on: 10 October 2019].

MARTÍ PARRENO, J., SANZ-BLAS, S., RUIZ-MAFE, C. & ALDAS-MANZANO, J. 2013. Key factors of teenagers' mobile advertising acceptance. *Industrial Management & Data Systems*, 11, (3): 732-749.

MARTIN, C. 2011. The third screen: marketing to your customers in a world gone mobile. [Online]. Available at: https://cavehenricks.com/wp-content/uploads/2011/08/THIRD-SCREEN_Press-Kit-1.pdf [Accessed on: 16 October 2019].

MASEKO, F. 2017. Top 10 African countries with the fastest download speeds listed. [Online]. Available at: https://www.itnewsafrica.com/2017/09/top-10-african-countries-with-the-fastest-download-speeds-listed/. [Accessed on: 24 May 2019].

MATIC, M. & VOJVODIC, K. 2014. Customer-Perceived Insecurity of Online Shopping Environment. *International Review of Management and Marketing*, 4 (1): 59-65.

MAY, J. & DIGA, K. 2015. Progress towards resolving the measurement link between ICT and poverty reduction. In *Impact of information society research in the global south* (pp. 83-104). Springer, Singapore.

MAYOWA, G.A., BLESSING, A., MOSUNMOLA, A., FRED, P. & MOTILEWA, D. 2017. Technology acceptance and usage: a catalyst for better performance of the 21st century SMEs in Nigeria. *Advanced Science Letters*, 23 (9): 9329-9333.

MAZZOCCHI, M. 2011. *Statistics for Marketing and Consumer Research*. London, Sage.

MBAH, T.B. 2010. The impact of ICT on students' study habits. Case study: University of Buea, Cameroon. *Journal of Science and technology education research,* 1, (5): 107 -110.

McGIVERN, Y. 2006. *The practice of market and social research: an introduction*, 2nd edn. New York: Prentice Hall.

MCGOLDRICK, P.J. & PIEROS, C.P. 1998. Atmospherics, pleasure, and arousal: the influence of response moderators. *Journal of Marketing Management*, 14 (1-3): 173-197.

MCKECHNIE, S. 1992. Consumer buying behaviour in financial services: an overview. *International Journal of Bank Marketing,* 10 (5): 4-12.

MCKINNON, J. 1988. Reliability and Validity in Field Research: some Strategies and Tactics. *Accounting, Auditing, & Accountability Journal*, 1, (1): 34-54.

MCMULLAN, R. 2005. 'Service quality vs price: the moderating role of customer loyalty', *Journal of Customer Behaviour*, 4 (3): 425-44.

MEOLA, A. 2016. The Rise of M-Commerce: Mobile Shopping Stats & Trends. [Online]. Available at: https://www.businessinsider.com/mobile-commerce-shopping-trends-stats-2016-10?IR=T [Accessed on: 02 February 2019].

MESO, P., MUSA, P. & MBARIKA, V. 2005. Towards a model of consumer use of mobile information and communication technology in LDCs: the case of sub-Saharan Africa. *Information Systems Journal*, 15, (2): 119-146.

MEUTER, M.L., BITNER, M.J., OSTROM, A.L. & BROWN, S.W. 2005. Choosing among alternative service delivery modes: An investigation of customer trial of self-service technologies. *Journal of marketing*, 69, (2): 61-83.

MING-YEN TEOH, W., CHOY CHONG, S., LIN, B. & WEI CHUA, J. 2013. Factors affecting consumers' perception of electronic payment: an empirical analysis. *Internet Research*, 23 (4): 465-485.

MIYAZAKI, A. D., & KRISHNAMURTHY, S. 2002. Internet seals of approval: Effects on online privacy policies and consumer perceptions. *Journal of Consumer Affairs*, 36 (1), 28-49.

MOAK, B. 2015. Students fall for fake Internet merchants, check scams. [online]. Available at: https://www.clarionledger.com/story/business/businessledger/2015/09/16/students-fall-fake-Internet-merchants-check-scams/32490647/ [Accessed on: 23 October 2019].

MOBILE MARKETING ASSOCIATION. 2009. MMA Updates Definition of Mobile Marketing. [Online]. Available at: http://www.mmaglobal.com/news/mma-updates-definition-mobile-marketing [Accessed on: 14 April 2019].

MOE, W.W. 2003. Buying, searching, or browsing: Differentiating between online shoppers using in-store navigational clickstream. *Journal of consumer psychology*, 13 (1-2): 29-39.

MOHAN, A. 2014. Consumer behaviour towards smartphone industry in Indian market. (PhD Thesis). Dublin Business School.

MOLLA, A. & LICKER, P.S. 2005. eCommerce adoption in developing countries: a model and instrument. *Information & management*, 42 (6): 877-899.

MONDSCHEIN, C.F. AND MONDA, C., 2019. The EU's General Data Protection Regulation (GDPR) in a research context. In *Fundamentals of Clinical Data Science* (pp. 55-71). Springer, Cham.

MORRIS, M.G. & DILLON, A. 1997. How user perceptions influence software use. *IEEE software*, 14 (4): 58-65.

MORTON, S.M., BANDARA, D.K., ROBINSON, E.M. & CARR, P.E.A. 2012. In the 21st century, what is an acceptable response rate? *Australian and New Zealand journal of public health*, 36 (2): 106-108.

MOUTINHO, L. & HUTCHESON, G.D. 2011. *The SAGE dictionary of quantitative management research*. Sage Publications.

MUSA, A.S., AZMI, M.N.L. & ISMAIL, N.S. 2015. Exploring the uses and gratifications theory in the use of social media among the students of mass communication in Nigeria. *Malaysian Journal of Distance Education*, 17 (2): 83-95.

MUSIIME, A. & RAMADHAN, M. (2011) "Internet banking, consumer adoption and customer satisfaction", *African Journal of Marketing Management* Vol. 3 (10): 261-269.

MYLONOPOULOS, N.A., DOUKIDIS, G.I. & EDITORS, G. 2003. Introduction to the special issue: mobile business: technological pluralism, social assimilation, and growth. *International Journal of Electronic Commerce*, 8 (1): 5-22.

NACHMIAS, C. F. & NACHMIAS, D. 2008. *Research methods in the social sciences*, 7th ed. New York: Worth.

NAGRA, G. & GOPAL, R. 2013. An study of factors affecting on online shopping behavior of consumers. *International journal of scientific and research publications*, 3 (6): 1-4.

NAMBISAN, S. & BARON, R.A. 2007. Interactions in virtual customer environments: Implications for product support and customer relationship management. *Journal of interactive marketing*, 21 (2): 42-62.

NARANG, B. & ARORA, J.B. 2016. Present and future of mobile commerce: Introduction, comparative analysis of m commerce and e commerce, advantages, present and future. In *Securing transactions and payment systems for m-Commerce* (pp. 293-308). IGI Global.

NAZ, T. 2019. Online Shopping Behaviour Technology Advancement: A Great Change in Consumer Behaviour. *Available at SSRN 3333079*.

NELSON MANDELA METROPOLITAN UNIVERSITY. 2019. Fast Facts: Institutional Indicators Q3. [Online]. https://www.mandela.ac.za/About-us/Fast-Facts [Accessed on: 10 July 2019].

NGAI, E.W.T., LI, C.L., CHENG, T.C.E., LUN, Y.V., LAI, K.H., CAO, J. & LEE, M.C.M. 2011. Design and development of an intelligent context-aware decision support system for real-time

monitoring of container terminal operations. *International Journal of Production Research*, 49 (12): 3501-3526.

NIRANJANAMURTHY, M., KAVYASHREE, N., JAGANNATH, S. & BHARGAVA, R. 2012. M-Commerce: Security challenges issues and recommended secure payment method. *Int. J. Manag. IT Eng*, 2 (8): 374-393.

NIRANJANAMURTHY, M., KAVYASHREE, N., JAGANNATH, S. & CHAHAR, D. 2013. Analysis of e-commerce and m-Commerce: advantages, limitations, and security issues. *International Journal of Advanced Research in Computer and Communication Engineering*, 2 (6): 2360-2370.

NOEL, H. 2009. *Basics marketing 01: Consumer behaviour* (Vol. 1). AVA Publishing.

NOTOMI, N., TSUKAMOTO, M., KIMURA, M. & YAMAMOTO, S. 2015. ICT and the future of the retail industry-Consumer-centric retailing. *NEC Tech. J*, 10 (1): 38-41.

NUNTHARMAWIA, A. 2018. Online Buying Behaviour a study of Mizoram University Students. (Masters Thesis). Mizoram University.

NYSVEEN, H., PEDERSEN, P.E. & THORBJORNSEN, H. 2005. 'Intentions to use mobile services: antecedents and cross service comparisons', *Journal of the Academy of Marketing Science*, 33, (3): 330-46.

OLSON, E.M., SLATER, S.F., HULT, G.T.M. & OLSON, K.M. 2018. The application of human resource management policies within the marketing organization: The impact on business and marketing strategy implementation. *Industrial Marketing Management*, 69: 62-73.

ONO, A., NAKAMURA, A., OKUNO, A. AND SUMIKAWA, M. 2012. Consumer motivations in browsing online stores with mobile devices. *International Journal of Electronic Commerce*, 16 (4): 153-178.

ONWUEGBUZIE, A.J. AND FRELS, R. 2016. *Seven steps to a comprehensive literature review: A multimodal and cultural approach*. Sage.

OPENSIGNAL. 2017. State of Mobile Networks: South Africa. [Online]. Available at: https://www.opensignal.com/reports/2017/08/southafrica/state-of-the-mobile-network [Accessed on 23 January 2019].

OYELARAN-OYEYINKA, B. & ADEYA, C.N. 2004. Internet access in Africa: empirical evidence from Kenya and Nigeria. *Telematics and Informatics*, 21 (1):67-81.

ÖZPOLAT, K. AND JANK, W. 2015. Getting the most out of third party trust seals: An empirical analysis. *Decision Support Systems*, 73: 47-56.

PAHWA, A. 2018. What Is M-Commerce? | The Rise Of Mobile Commerce. [Online]. Available at: https://www.feedough.com/m-Commerce-rise-mobile-commerce/ [Accessed on 22 February 2019].

PALLANT, J. 2010. *SPSS Survival Manual: A step by step guide to data analysis using SPSS,* 4th *Edition*. Berkshire, UK, McGraw Hill.

PARKER, C.J. & WANG, H. 2016. Examining hedonic and utilitarian motivations for m-Commerce fashion retail app engagement. *Journal of Fashion Marketing and Management: An International Journal*, 20 (4): 487-506.

PASQUA, R. & ELKIN, N. 2012. *Mobile marketing: An hour a day*. John Wiley & Sons.

PATTON, M.A. & JØSANG, A. 2004. Technologies for trust in electronic commerce. *Electronic Commerce Research*, 4 (1-2): 9-21.

PEDERSEN, P. 2005. Adoption of mobile Internet services: An exploratory study of mobile commerce early adopters. *Journal of Organizational Computing and Electronic Commerce*, 15(3), 203-222.

PENG, B. & SPENCER, I. 2006. Mobile marketing-the Chinese perspective. *International Journal* of *Mobile Marketing*, 1, (2): 50-59.

PERRY, C. 1998. Processes of a case study methodology for postgraduate research in marketing. *European journal of marketing*, 32 (9/10): 785-802.

PERRY, C. 2002. A structured approach to presenting theses: notes for students and their supervisors. *International Journal of Organizational Behaviour,* 16 (1): 1-12.

PERRY, T.T., ANNE PERRY, L. & HOSACK-CURLIN, K., 1998. Internet use by university students: an interdisciplinary study on three campuses. *Internet Research*, 8 (2): 136-141.

PERSAUD, A. & AZHAR, I. 2012. Innovative mobile marketing via smartphones: Are consumers ready? *Marketing Intelligence & Planning*, 30, (4): 418-443.

PETER, J.P., OLSON, J.C. & GRUNERT, K.G. 1999. *Consumer behaviour and marketing strategy* (pp. 329-48). London: McGraw-Hill.

PEZZULLO, J., 2013. *Biostatistics for dummies*. John Wiley & Sons.

PILLAY, K. 2016. South Africa must move on from physical universities South Africa must move from physical universities. [Online]. Available at: https://www.itnewsafrica.com/2016/02/south-africa-must-move-on-from-physical universities/.

PINGITORE, G., RAO, V., CAVALLARO, K. & DWIVEDI, K. 2017. To share or not to share: What consumers really think about sharing their personal information. [Online]. Available at: https://www2.deloitte.com/us/en/insights/industry/retail-distribution/sharing-personal-information-consumer-privacy-concerns.html [Accessed on: 15 November 2019].

PITTAWAY, C. 2017. Mobile payments are becoming much more regular in South Africa. [Online]. Available at: https://www.itnewsafrica.com/2017/12/mobile-payments-are-becoming-much-more-regular-in-south-africa/ [Accessed on 23 November 2019].

PLANET54. 2019. Privacy policy. [Online]. Available on: https://planet54.com/pages/privacy-policy [Accessed on: 22 June 2018].

PODSAKOFF, P. M., MACKENZIE, S. B. & PODSAKOFF, N. P. 2012. Sources of method bias in social science research and recommendations on how to control it. *Annual review of* psychology, 63: 539-569.

PONTE, E.B., CARVAJAL-TRUJILLO, E. & ESCOBAR-RODRÍGUEZ, T. 2015. Influence of trust and perceived value on the intention to purchase travel online: Integrating the effects of assurance on trust antecedents. *Tourism Management*, 47: 286-302.

POPOVIĆ, K. & HOCENSKI, Ž. 2010. Cloud computing security issues and challenges. In *The 33rd International Convention MIPRO* (pp. 344-349). IEEE.

POWERS, T., ADVINCULA, D., AUSTIN, M.S., GRAIKO, S. & SNYDER, J. 2012. Digital and social media in the purchase decision process: A special report from the Advertising Research Foundation. *Journal of advertising research*, 52 (4): 479-489.

PREACHER, K.J., RUCKER, D.D. & HAYES, A.F. 2007. Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate behavioral research*, 42 (1): 185-227.

PROCTER, L., ANGUS, D.J., BLASZCZYNSKI, A. & GAINSBURY, S.M. 2019. Understanding use of consumer protection tools among Internet gambling customers: Utility of the Theory of Planned Behavior and Theory of Reasoned Action. *Addictive behaviors*, 99: 106.

PUNYANUNT-CARTER, N.M., DE LA CRUZ, J.J. & WRENCH, J.S. 2017. Investigating the relationships among college students' satisfaction, addiction, needs, communication apprehension, motives, and uses & gratifications with Snapchat. *Computers in Human Behavior*, *75*: 70-875.

RAHMAN, S.U., KHAN, M.A. & IQBAL, N. 2018. Motivations and barriers to purchasing online: understanding consumer responses. *South Asian Journal of Business Studies*, 7 (1): 111-128.

RALETING, T. & NEL, J. 2011. Determinants of low-income non-users' attitude towards WIG mobile phone banking: Evidence from South Africa. *African Journal of Business Management*, 5, (1): 212.

RAYPORT, J. F. & JAWORSKI, B. J. 2017. *E-commerce*. Boston: McGraw-Hill/Irwin MarketspaceU.

REDDY, A. 2012. A study on consumer perceptions on security, privacy and trust on e−commerce portals. *International Journal of Multidisciplinary Management Studies*, 2 (3): 1-15.

REDDY, G., 2016. Digital marketing impact on the consumer decision making process in Nike's customer retail operations in South Africa. (PhD Thesis). University of Pretoria.

REMENYI, D., WILLIAMS, B., MONEY, A. & SWARTZ, E. 2003. *Doing research in business and management: An introduction to process and method*. London, SAGE Publications.

REUTERS. 2018. Mauritius bank SBM says unit's India operations hit by cyber fraud**.** [Online]. Available at: https://www.reuters.com/article/us-sbm-hldgs-cybercrime-idUSKCN1MD1LM [Accessed on: 16 October 2019].

RICE, M.F. 2003. Information and communication technologies and the global digital divide: Technology transfer, development, and least developing countries. *Comparative Technology Transfer and Society*, 1 (1): 72-88.

RIGOLLET, D.Ý. & KUMLIN, H., 2015. Consumer Attitudes towards Push Notifications: As a Marketing Tool to Trigger Impulse Buying Behaviour in Smartphone Users. (Bachelor dissertation). Linnaeus University.

ROACH, G., 2009. Consumer perceptions of mobile phone marketing: a direct marketing innovation. *Direct marketing: an international journal*, 3, (2): 124-138.

ROBINSON, C.D., TOMEK, S. & SCHUMACKER, R.E. 2013. Tests of moderation effects: Difference in simple slopes versus the interaction term. *Multiple Linear Regression Viewpoints*, 39 (1): 16-24.

ROGERS, E. 1962. *Diffusion of Innovations*. New York: The Free Press.

ROGERS, E. 1995. *Diffusion of Innovations*, 4th edition. New York: The Free Press.

ROGERS, E. 2003. Diffusion of innovations, 5th edition. New York: The Free Press.

ROGGER, A.J. & CELIA, I. 2004. Akzeptanz des Kaufens und Bezahlens mit dem Mobiltelefon. *In Proceedings of the 4th Workshop on Mobile Commerce* (Pousttchi,K. and Turowski, K. Eds.), 79-85, Augsburg, Germany.

ROHM, A.J. & SULTAN, F. 2006. An exploratory cross-market study of mobile marketing acceptance. *International Journal of Mobile Marketing*, 1 (1), pp.4-12.

ROOS, D. 2008. The History of E-commerce. [Online]. Available at: https://money.howstuffworks.com/history-e-commerce.htm [Accessed on 12 March 2019].

ROWLANDS, I., NICHOLAS, D., WILLIAMS, P., HUNTINGTON, P., FIELDHOUSE, M., GUNTER, B., WITHEY, R., JAMALI, H.R., DOBROWOLSKI, T. & TENOPIR, C. 2008. The Google generation: the information behaviour of the researcher of the future. In *Aslib proceedings* (Vol. 60, No. 4, pp. 290-310), July 2008. Emerald Group Publishing Limited.

ROWLEY, J. 2000. Product searching with shopping bots. *Internet Research*, 10 (3): 203-214.

RUGIMBANA, R. & IVERSEN, P. 1994. Perceived Attributes of ATMs and The Marketing Implications. *International Journal of Bank Marketing,* 12 (2): 30-35.

SAMAKOSKY, N. 2016. Here's why mobile marketing in South Africa is a must. [Online]. Available at: https://memeburn.com/2016/05/mobile-marketing-south-africa/ [Accessed on 11 July 2019].

SAUNDERS, M., LEWIS, P. & THORNHILL, A. 2009. *Research methods for business students*, 5th ed. Harlow, Pearson Education.

SCHIFFMAN, G. L., KANUK, L., L. & KUMAR, R. S. 2010. *Consumer Behaviour*, 10th Edition. Prentice Hall: Dorling Kindersley.

SCHOENHERR, T. 2019. The Evolution of Electronic Procurement. In *The Evolution of Electronic Procurement* (pp. 33-46). Palgrave Pivot, Cham.

SCHOLZ, J. & DUFFY, K. 2018. We ARe at home: How augmented reality reshapes mobile marketing and consumer-brand relationships. *Journal of Retailing and Consumer Services*, 44: 11-23.

SCHWAB, K., 2017. *The fourth industrial revolution*. Currency.

SCOTT, D.M. 2015. *The New Rules of Marketing and PR.: How to Use Social Media, Online Video, Mobile Applications, Blogs, News Releases, and Viral Marketing to Reach Buyers Directly*. John Wiley & Sons.

SEDMAK, M. & LONGHURST, P. 2010. Methodological choices in enterprise systems research. Business. *Process Management Journal*, 16 (1): 76-92.
SEKARAN, U. & BOUGIE, R. 2016. *Research methods for business: A skill building approach*. John Wiley & Sons.

SHAIKH, A.A. & KARJALUOTO, H., 2015. Mobile banking adoption: A literature review. *Telematics and informatics*, 32 (1): 129-142.

SHAMBARE, R. & DONGA, G. 2019. *The influence of social class and reference groups on the diffusion of innovations*. In: Janine LOEDOLFF. Consumer Behaviour: South African Psychology and Marketing Applications 2e. Oxford University Press Southern Africa.

SHAMBARE, R. 2012. Predicting consumer preference for remote banking services in South Africa and Zimbabwe: the role consumer perceptions versus personality variables. (PhD Thesis). Tshwane University of Technology.

SHAMBARE, R. 2014. The adoption of WhatsApp: Breaking the vicious cycle of technological poverty in South Africa. *Journal of Economics and behavioral studies*, 6 (7): 542–550.

SHAMBARE, R., RUGIMBANA, R. & SITHOLE, N., 2012. Social networking habits among students. *African Journal of Business Management*, 6 (2): 578-786.

SHAMBARE, R., RUGIMBANA, R. & ZHOWA, T. 2012. Are mobile phones the 21st century addiction?. *African Journal of Business Management*, 6 (2): 573-577.

SHAN, Y. 2016. How credible are online product reviews? The effects of self-generated and system-generated cues on source credibility evaluation. *Computers in Human Behavior*, 55: 633-641.

SHANKAR, V. & BALASUBRAMANIAN, S. 2009. Mobile marketing: a synthesis and prognosis. Journal *of interactive marketing*, 23, (2): 118-129.

SHAVA, H., CHINYAMURINDI, W. & SOMDYALA, A. 2016. An investigation into the usage of mobile phones among technical and vocational educational and training students in South Africa. South *African journal of information management*, 18 (1): 1-8.

SHEIKH, A.A., SHAHZAD, A. & ISHAQ, A.K. 2017. The impact of market orientation, top management support, use of e-marketing and technological opportunism on the firm performance. A mediated moderation and moderated mediation analysis. *Abasyn Journal of Social Sciences*, 10 (2): 212-234.

SHEIKH, M. & ISLAM, S. 2006. Mobile Commerce: the use of m-Commerce by customers today. (Masters Thesis). Lulea University of Technology.

SHIM, J.K., QURESHI, A.A., SIEGEL, J.G. & SIEGEL, R.M. 2013. *The international handbook of electronic commerce*. Routledge.

SHIU, E., HAIR, J., BUSH, R. & ORTINAU, D. 2009. *Marketing Research*. Berkshire, McGraw Hill.

SHNEIDERMAN, B., 2000. Designing trust into online experiences. *Communications of the ACM*, 43 (12): 57-59.

SHUKLA, P. 2008. *Essentials of marketing research.* Ventus Publishing.

SIDDIQUI, A.T. 2002. M-COMMERCE: SECURITY IN MOBILE TRANSACTION. *IEEE Communication Magazine on E-Commerce*.

SIMICART. 2019. 11 key differences between E-commerce and M-Commerce. [Online]. Available at: https://www.simicart.com/blog/differences-between-e-commerce-and-m-Commerce/ [Accessed on: 22 September 2019].

SINGH, A.K. 2017. Evolution of Commerce from E-Commerce to M-Commerce. *Journal of Business Management & Quality Assurance (e ISSN 2456-9291)*, 1 (3): 1-10.

SINHA, C. & HYMA, R. 2013. ICTs and social inclusion. *Connecting ICTs to development*, 91.

SLADE, E.L., DWIVEDI, Y.K., PIERCY, N.C. & WILLIAMS, M.D. 2015. Modeling consumers' adoption intentions of remote mobile payments in the United Kingdom: extending UTAUT with innovativeness, risk, and trust. *Psychology & Marketing*, 32 (8): 860-873.

SMUTKUPT, P., KRAIRIT, D. & ESICHAIKUL V. 2010. Mobile marketing: Implications for marketing strategies. *International Journal of Mobile Marketing*, 5, (2): 126-139.

SOLOMON, M.R., DAHL, D.W., WHITE, K., ZAICHKOWSKY, J.L. & POLEGATO, R. 2014. *Consumer behavior: Buying, having, and being* (Vol. 10). Toronto, Canada: Pearson.

SOUTH AFRICA'S NATIONAL R & D STRATEGY. 2002. [Online]. Available at: http://www.dst.gov.za/images/pdfs/National%20research%20%20development%20strategy%202002.pdf [Accessed on: 22 August 2017].

SOWDAGUR, D. 2006. Consumer behaviour with respect to domestic water in Mauritius including a model. (PhD Thesis). University of South Africa.

SPARKS, B.A., SO, K.K.F. & BRADLEY, G.L. 2016. Responding to negative online reviews: The effects of hotel responses on customer inferences of trust and concern. *Tourism Management*, 53: 74-85.

SPS COMMERCE, 2018. How to improve e-commerce conversion rates for your online store. [Online]. Available at: https://www.spscommerce.com/blog/improve-ecommerce-conversion-spsg/ [Accessed on 27 November 2019].

STAFFORD, T.F., STAFFORD, M.R. & SCHKADE, L.L. 2004. 'Determining uses and gratifications for the Internet', *Decision Sciences*, 35, (2): 259-88.

STAGLIANO, T., DIPOALO, A. & COONNELLY, P. 2013. The consumerization of information technology. *Graduate Annual*, 1 (1): 10.

STRAUSS, J. & FROST, R.D. 2016. *E-marketing: Instructor's Review Copy*. Routledge.

SUH, B. & HAN, I. 2003. The Impact of Customer Trust and Perception of Security Control on the Acceptance of Electronic Commerce. *International Journal of Electronic Commerce*, 7, (3): 135-161.

SULTAN, F., ROHM, A.J. & GAO, T.T. 2009. Factors influencing consumer acceptance of mobile marketing: a two-country study of youth markets. *Journal of Interactive Marketing*, 23 (4): 308-320.

SULTAN, M.U. & UDDIN, M. 2011. Consumers' Attitude towards Online Shopping: Factors influencing Gotland consumers to shop online. (Masters Thesis). Gotland University.

SUN, H. & ZHANG, P. 2006. The role of moderating factors in user technology acceptance. *International journal of human-computer studies*, 64 (2): 53-78.

SUNAR, B., MARTIN, W.J. & STINSON, D.R. 2007. A provably secure true random number generator with built-in tolerance to active attacks. *IEEE Transactions on computers*, 56, (1): 109-119.

SURESH, K.P. 2011. An overview of randomization techniques: an unbiased assessment of outcome in clinical research. *Journal of human reproductive sciences*, 4, (1): 8.

TAMARKIN, E. 2014. As one of the world's most active cybercrime countries, SA must protect itself against increasing virtual threats. [Online]. Available at: https://issafrica.org/iss-today/south-africa-must-pay-more-attention-to-cybercrime [Accessed on: 23 August 2019].

TAN, M. & TEO, T.S.H. 2000. ''Factors influencing the adoption of Internet banking'', *Journal of the Association for Information Systems*, 1 (5), 1-44.

TANAKINJAL, G.H. 2006. Short Message Service (SMS) and Banking. (PhD Thesis). University of Otago.

TARHINI, A., ALALWAN, A.A., SHAMMOUT, A.B. & AL-BADI, A. 2019. An analysis of the factors affecting mobile commerce adoption in developing countries. *Review of International Business and Strategy*.

TASHAKKORI, A., & TEDDLIE, C. 1998. Mixed methodology: Combining qualitative and quantitative approaches. Thousand Oaks, CA: SAGE.

TEECE, D.J. 2010. Business models, business strategy and innovation. *Long range planning*, 43 (2-3): 172-194.

TOBBIN, P.E. 2013. *Examining the adoption and use of mobile data services: a consumer* behavior *analysis*. (Doctoral dissertation). Aalborg University Denmark.

TOFIGHI, D. & MACKINNON, D. P. 2011. RMediation: An R package for mediation analysis confidence intervals. *Behavior Research Methods,* 43*,* 692-700.

TOMS, E.G. 2000. Understanding and facilitating the browsing of electronic text. *International Journal of Human-Computer Studies*, 52 (3): 423-452.

TSIKRIKTSIS, N. 2004. A Technology Readiness-Based Taxonomy of Customers: A replication and extension. *Journal of Service Research* 7(1): 42-52.

UNIRANK. 2019. University of Limpopo Overview. [Online]. Available at: https://www.4icu.org/reviews/4223.htm [Accessed on 04 July 2020].

UNI24. 2020. List of Traditional Universities in South Africa. [Online]. Available at: https://uni24.co.za/list-of-traditional-universities-in-south-africa/ [Accessed on 14 July 2020].

UNIVERSITIES SOUTH AFRICA. 2017. Public Universities in South Africa. https://www.usaf.ac.za/public-universities-in-south-africa/ [Accessed on: 24 October 2018].

VAAL UNIVERSITY OF TECHNOLOGY. 2019. VUT at Glance. Alumni Brag Magazine.

VAN DER WALDT, D.R., REBELLO, T.M. & BROWN, W.J. 2009. Attitudes of young consumers towards SMS advertising. *African Journal of Business Management*, 3 (9): 444-452.

VAN DEURSEN, A.J. & HELSPER, E.J. 2015. The third-level digital divide: Who benefits most from being online?. In *Communication and information technologies annual* (29-52). Emerald Group Publishing Limited.

VAN DIJK, J. 2006. Digital divide research, achievements, and shortcomings. *Poetics.* 34 (4-5): 221-235.

VAN OOIJEN, J. 2019. Driving consumer engagement through online social influencers an empirical investigation of content orientations and characteristics using mixed effects modeling. (Masters Thesis). Eindhoven University of Technology.

VANNOY, S.A. & PALVIA, P. 2010. The social influence model of technology adoption. *Communications of the ACM*, 53 (6): 149-153.

VARMA CITRIN, A., SPROTT, D.E., SILVERMAN, S.N. & STEM JR, D.E., 2000. Adoption of Internet shopping: the role of consumer innovativeness. *Industrial management & data systems*, 100 (7): 294-300.

VARNALI, K. & TOKER, A. 2010. Mobile marketing research: the-state-of-the-art. *International Journal of Information Management,* 30*,* 144-151.

VATANPARAST, R., 2010. Mobile service adoption optimization: A Case Study. *International Journal of Mobile Marketing*, 5 (2).

VEIJALAINEN, J., TERZIYAN, V. & TIRRI, H. 2006. Transaction management for m-Commerce at a mobile terminal. *Electronic Commerce Research and Applications*, 5 (3): 229-245.

VELMURUGAN, M.S. 2012. An empirical analysis of consumers' protection toward e-commerce transactions in Malaysia. *International journal of business Information systems*, 9 (3): 295-327.

VENKATESH, V. & ZHANG, X. 2010. Unified theory of acceptance and use of technology: US vs. China. *Journal of global information technology management*, 13 (1): 5-27.

VENKATESH, V., MORRIS, M.G., DAVIS, G.B. & DAVIS, F.D. 2003. User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27 (3): 425–478.

VERVERIDIS, C. & POLYZOS, G. C. 2002. Mobile marketing using a location based service. Proceedings *of the First International Conference on Mobile Business*. Prentice-Hall.

VICENTE, A. 2016. SA is top cyber crime target in Africa. [Online]. Available at: https://www.itweb.co.za/content/xo1Jr5qx6Zk7KdWL [Accessed on: 17 November 2018].

WAHAB, M. 2003. The Digital Divide, E-Commerce, and ODR: Constructing the Egyptian Information Society. In *Proceedings of the Second United Nations Forum on Online Dispute* Resolution.

WAIS, J.S. & CLEMONS, E.K. 2008. Understanding and implementing mobile social advertising. *International Journal of Mobile Marketing*, 3, (1): 12-18.

WALCZUCH, R., LEMMINK, J. & STREUKENS, S. 2007. The effect of service employees' technology readiness on technology acceptance. *Information & Management,* 44: 206-215.

WANG, B., 2016. A Study of Factors Influencing Mobile Internet User Behavior Based on the Business Scenario of Mobile Entertainment Applications. *International Journal of Simulation--Systems, Science & Technology*, 17 (14).

WANG, J., WANG, S., XUE, H., WANG, Y. & LI, J. 2018. Green image and consumers' word-of-mouth intention in the green hotel industry: The moderating effect of Millennials. *Journal of cleaner production*, 181: 426-436.

WANKMUELLER, J.2012. *System and method for conducting electronic commerce with a remote wallet server*. U.S. Patent 8,150,767. Mastercard International Inc.

WEILER, A. 2005. Information-seeking behavior in generation Y students: Motivation, critical thinking, and learning theory. *The journal of academic librarianship*, 31 (1): 46-53.

WILLIAMS, R. 2010. Credibility in an E-retailer: a South African perspective. (Masters dissertation). University of Pretoria.

WILLIS, J.W. & JOST, M. 2007. Frameworks for qualitative research. *Foundations of Qualitative* Research, 1 (1): 148-185.

WIRTZ, J., DEN AMBTMAN, A., BLOEMER, J., HORVÁTH, C., RAMASESHAN, B., VAN DE KLUNDERT, J., GURHAN CANLI, Z. & KANDAMPULLY, J. 2013. Managing brands and customer engagement in online brand communities. *Journal of service Management*, 24 (3): 223-244.

WOLFINBARGER, M. & GILLY, M.C., 2001. Shopping online for freedom, control, and fun. *California management review*, 43 (2): 34-55.

WU, C.H., KAO, S.C. & YANG, K.D. 2012. Acceptance of real-time location-based advertising service: a conceptual examination. *Journal of Location Based Services*, 6 (4): 250-269.

WU, J.H. & WANG, S.C. 2005. What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & management*, 42, (5): 719-729.

WU, K.W., HUANG, S.Y., YEN, D.C. & POPOVA, I. 2012. The effect of online privacy policy on consumer privacy concern and trust. *Computers in human behavior*, 28 (3): 889-897.

XIE, K. & LEE, Y.J. 2015. Social media and brand purchase: Quantifying the effects of exposures to earned and owned social media activities in a two-stage decision making model. *Journal of Management Information Systems*, 32 (2): 204-238.

XU, H., TEO, H.H., TAN, B.C. & AGARWAL, R. 2009 The role of push-pull technology in privacy calculus: the case of location-based services. *Journal of management information systems*, 26 (3): 35-174.

YADAV, S., REDDY, A.K.K., REDDY, A.L. & RANJAN, S. 2010. Detecting algorithmically generated malicious domain names. In *Proceedings of the 10th ACM SIGCOMM conference on Internet measurement* (pp. 48-61). ACM.

YANG, H.C. 2013. Bon Appétit for apps: young American consumers' acceptance of mobile applications. *Journal of Computer Information Systems*, 53 (3): 85-96.

YANG, H.C. AND ZHOU, L., 2011. Extending TPB and TAM to mobile viral marketing: An exploratory study on American young consumers' mobile viral marketing attitude, intent and behaviour. *Journal of Targeting, Measurement and Analysis for Marketing*, 19 (2): 85-98.
YANG, K.C., 2005. Exploring factors affecting the adoption of mobile commerce in Singapore. *Telematics and informatics*, 22 (3): 257-277.

YANG, S. 2016. Role of transfer-based and performance-based cues on initial trust in mobile shopping services: a cross-environment perspective. *Information Systems and e-Business Management*, 14 (1): 47-70.

YANG, Y., LIU, Y., LI, H. & YU, B. 2015. Understanding perceived risks in mobile payment acceptance. *Industrial Management & Data Systems*, 115 (2): 253-269.

YIN, R. K. 2003. *Case study research: Design and methods*, 3rd edition. London, SAGE Publications.

YU, C.S. 2012. Factors affecting individuals to adopt mobile banking: Empirical evidence from the UTAUT model. *Journal of electronic commerce research*, 13 (2): 104.

YU, J.H. 2013. You've got mobile ads! Young consumers' responses to mobile ads with different types of interactivity. *International Journal of Mobile Marketing*, 8 (1).

ZHANG, C., PATRAS, P. & HADDADI, H. 2019. Deep learning in mobile and wireless networking: A survey. *IEEE Communications Surveys & Tutorials*, 21 (3): 2224-2287.

ZHANG, K.Z., CHEUNG, C.M. & LEE, M.K. 2014. Examining the moderating effect of inconsistent reviews and its gender differences on consumers' online shopping decision. *International Journal of Information Management*, 34 (2): 89-98.

ZHOU, L., DAI, L. & ZHANG, D. 2007. Online shopping acceptance model-A critical survey of consumer factors in online shopping. *Journal of Electronic commerce research*, 8 (1).

ZOLKEPLI, I.A. & KAMARULZAMAN, Y. 2011. Understanding social media adoption: the role of perceived media needs and technology characteristics. *World Journal of Social Sciences*, 1 (1): 188-199.

APPENDIX A: ESTIMATED BUDGET FOR THE RESEARCH STUDY

ITEM	**QUANTITY**	**RAND/ UNIT**	**AMOUNT (RAND)**
ASSISTANCE			
Stipend for 2 Research assistants for Data collection @ R160 X 29days	29	160	4640
STATIONERY AND CONSUMABLES			
Stapler	1	100	100
Staple pins	1 box	100	100
Writing Pens	10	10	100
Highlighters	5	20	100
Events Diary	1	70	70
Files for storage of 1000 questionnaires	4	100	400
Puncher	1	100	100

External hard drive for data storage	1	1000	1000
Stationery subtotal			**1970**
SUBSISTENCE AND TRAVELLING			
Data collection trips to Nelson Mandela Metropolitan University from Thohoyandou and from NMMU to Thohoyandou (Researcher and 1 assistant)	1500 km	3.55	21300
Data collection trips to University of Limpopo from Thohoyandou and from UL to Thohoyandou (Researcher and 2 assistants).	188km	3.55	4004,40
Data collection trips to Vaal University of Technology from Thohoyandou and from VUT to Thohoyandou (Researcher and 2 assistants).	577km	3.55	12290.1
Accommodation in Eastern Cape (Researcher and 1 assistants).	9 days	450	7200
Accommodation in Vanderbijlpark (Researcher and 2 assistants)	5 days	450	6750
Accommodation in Polokwane (Researcher and 2 assistants)	5 days	450	6750
Subtotal for subsistence and travelling			**58294,5**
BINDING			
Spiral binding	5	100	500
Hardy copy binding	6	250	1500
Binding total			**2000**
PRINTING			
Printing of online research articles	Aprox 96 copies of 15 pages	3	4320

Printing of final research	6 copies of 200 pages each	3	3600
Total of printing			**7920**
Grand total for the whole research			**74824,5**

APPENDIX B: RESEARCH QUESTIONNAIRE

University of Venda

CONSENT LETTER

Dear Participant,

Introduction

Thank you for participating in this research. This questionnaire is part of a study designed to assess the moderating effect of information security on the adoption of mobile marketing transactions among South African students. The questionnaire should only take up to 20 minutes of your time. Your cooperation is much appreciated.

General Instructions

The following instructions and conditions must be understood by all respondents:

(a) Answer from your own perspective, as honestly as possible;
(b) Please complete all sections, do not leave any unanswered questions;
(c) Please note that your name is not required, hence confidentiality is assured.
(d) Indicate your selected response by marking with a cross (x).
(e) Note. There are no wrong or right answers.

(f) By completing the survey, you indicate that you voluntarily participate in this research.

The primary investigator, Mr. Gift Donga, can be contacted during office hours on his mobile phone at 0630133511, or email geedonga@gmail.com.

Thank you.

Mr. Gift Donga

The responded consented to participate in the survey	yes	no

Definition of terms;

Mobile marketing transactions: Any marketing transactional activity conducted through an established network to which consumers are constantly connected using a personal mobile device.

Third party seal: an online branded trust mark which is used by third party site verification entities to help protect online consumers by identifying Web sites that protect the online privacy and safety of consumers.

Online store: is a Web site that enables visitors to find, order and pay for products and services.

SECTION A: Demographics

1. What is your age?

18 – 24 years	**1**
25 – 35 years	**2**
36+ years	**3**

2. What is your gender?

Male	**1**
Female	**2**

3. What is your study status?

Full-time student	**1**
Part-time student	**2**

4. Indicate your current level of study

Undergraduate	**1**
B. Tech/ Honours Degree	**2**
Masters	**3**
Doctorate	**4**

5. Indicate your current institution

University of Limpopo	**1**
Vaal University of Technology	**2**
Nelson Mandela Metropolitan University	**3**

Section B: Internet Familiarity and Internet Usage Habits

6. Do you use the Internet?

Yes	**1**
No	**2**

7. Besides work or School, what is your primary personal use of the Internet?

Information and product search	**1**
purchasing	**2**
E-mail /Other communication (i.e., chatting)	**3**
Game / Music/ Program downloading / Entertainment	**4**
On-line banking/ Pay bills	**5**

8. How long have you been familiar with the Internet?

Less than 1 year	**1**
1 – 3 years	**2**
4 – 6 years	**3**
7 – 10 years	**4**
11 years or more	**5**

9. How long do you use the Internet per day?

Less than 1 hour	**1**
Up to 1 hour	**2**
1 – 3 hours	**3**
3 – 5 hours	**4**
5 hours +	**5**

10. Where do you access the Internet? (Mark all that apply)

At home/ 3G/ Wi-Fi	**1**
Internet Café	**2**
School	**3**
Public library	**4**
Other, specify	**5**

SECTION C: Mobile Marketing Transactions Usage

11. On average how many times per day do you receive a marketing related notification on your mobile device?

Once	**1**
2-4 times	**2**
5 times	**3**
More than 5 times	**4**

12. What do you usually do when you receive a marketing notification on your mobile device?

Ignore it completely	**1**
Read it occasionally	**2**
Read it after accumulating to many	**3**
Read it right away	**4**
Read it when I get time	**5**

13. I conduct mobile marketing transactions where I can reduce my efforts in traveling, walking, parking, waiting, and carrying as much as possible.

Strongly agree	**1**
Disagree	**2**
Neutral	**3**
Agree	**4**
Strongly agree	**5**

14. When reflecting on my use of the Internet, for mobile marketing transactions typically I am a?

Visitor (look for general product information only)	**1**
Browser (look for specific information but would not transact online)	**2**
Internet buyer (look for specific product information and would buy /have bought online)	**3**

SECTION D: Factors determining consumer adoption of mobile marketing

Providing information		**Strongly Disagree (1)**	**Disagree (2)**	**Neutral (3)**	**Agree (4)**	**Strongly Agree (5)**
PA1	I often provide my e-mail address to a web site using my mobile device	1	2	3	4	5
PA2	I often register with a web site using my mobile device	1	2	3	4	5
PA3	I often register for a competition or promotion using my mobile device	1	2	3	4	5

PA 4	Providing my personal information to websites will help me receive customised targeted offers.	1	2	3	4	5
Sharing content						
SC1	Friends often send me downloads such as applications, video clips, ringtones or screen graphics on my mobile device	1	2	3	4	5
SC2	I often send my friends new applications, video clips, screen graphics or ringtones on their mobile devices	1	2	3	4	5
SC 3	When I receive product related information or opinion from a friend, I will pass it along to my other contacts on the social network site	1	2	3	4	5
SC4	I am willing to recommend the product or service that I have seen advertised online to my friends or family.	1	2	3	4	5
Accessing content						
AC1	I often download content (wallpaper, ringtone, videos) using my mobile device.	1	2	3	4	5
AC2	I often access fun and entertaining content such as music or games using my mobile device.	1	2	3	4	5
AC3	I often pay for content such as games or music for my mobile device.	1	2	3	4	5
AC 4	My mobile phone is useful for accessing information related to stores, products, restaurants, etc.	1	2	3	4	5
Protection						
PROT 1	I am concerned about the privacy of my personal information during a transaction.	1	2	3	4	5
PROT 2	I am concerned that online stores will use my personal information for other purposes without my authorisation.	1	2	3	4	5
PROT 3	I am concerned that unauthorised persons (i.e. hackers) have access to my personal information.	1	2	3	4	5
PROT 4	I am concerned that online stores are collecting too much personal information from me.	1	2	3	4	5
Authentication						
AUTH 1	The presence of a third-party seal on the website makes me feel more comfortable to provide information online.	1	2	3	4	5
AUTH 2	The presence of a third-party seal on the website makes me feel much safer in terms of the transaction.	1	2	3	4	5
AUTH 3	Existing third party recognition bodies are adequate for the protection of online transactions.	1	2	3	4	5
AUTH 4	Third party seals make me feel safer in terms of privacy.	1	2	3	4	5
Verification						

VERI 1	I find online stores with a privacy policy on the home page trustworthy.	1	2	3	4	5
VERI 2	Availability of testimonials on the website enables me to verify if an online store is not fake.	1	2	3	4	5
VERI 3	When I view a website, the first impression I make within some few seconds likely influences my decision to continue interacting with the site or to browse to another.	1	2	3	4	5
VERI 4	It is difficult to differentiate between a genuine website and a fraudulent website for online stores.	1	2	3	4	5
Adoption						
ADOP1	I believe that using mobile marketing is compatible with the way I live my life.	1	2	3	4	5
ADOP2	I believe that using mobile marketing is compatible with the way I live my life.	1	2	3	4	5
ADOP3	I believe mobile devices, in general, are the best way to conduct marketing.	1	2	3	4	5

Thank you for your participation!

APPENDIX C: ETHICAL CLEARANCE CERTIFICATE

RESEARCH AND INNOVATION
OFFICE OF THE DIRECTOR

NAME OF RESEARCHER/INVESTIGATOR:
Mr G Donga

Student No:
15017562

PROJECT TITLE: **The moderating effect of information security on the adoption of mobile marketing transactions among selected South African tertiary students**

PROJECT NO: **SMS/18/BMA/02/1807**

SUPERVISORS/ CO-RESEARCHERS/ CO-INVESTIGATORS

NAME	INSTITUTION & DEPARTMENT	ROLE
Prof A Kadyamatimba	University of Venda	Promoter
Prof R Shambare	University of Venda	Co - Promoter
Mr G Donga	University of Venda	Investigator – Student

ISSUED BY:
UNIVERSITY OF VENDA, RESEARCH ETHICS COMMITTEE

Date Considered: July 2018
Decision by Ethical Clearance Committee Granted
Signature of Chairperson of the Committee: .....
Name of the Chairperson of the Committee: Senior Prof. G.E. Ekosse

UNIVERSITY OF VENDA
DIRECTOR
RESEARCH AND INNOVATION
2018 -07- 20
Private Bag X5050
Thohoyandou 0950

University of Venda
PRIVATE BAG X5050, THOHOYANDOU, 0950λ LIMPOPO PROVINCEλ SOUTH AFRICA
TELEPHONE (015) 962 8504/8313 **FAX** (015) 962 9060
"A quality driven financially sustainable, rural-based Comprehensive University"

APPENDIX D: LANGUAGE EDITING CERTIFICATE

Sahara
PUBLISHING, PRINTING & TRAINING

Tel: +27 12 661 7248/ +27 82 084 4839
Fax: 086 764 4946
Email: info@saharapublishing.co.za
Reg No: 2009/177002/23

Unit 4076B Thatchfield Crescent, The Reeds, Centurion
PO Box 468, Celtis Ridge, Centurion, Pretoria 0130

CERTIFICATE OF EDITING

This document certifies that the thesis listed below was edited for proper English language, grammar, punctuation, spelling, and overall style by Alison Ziki, a member of the Professional Editors' Guild of South Africa.

Thesis Title

THE MODERATING EFFECT OF INFORMATION SECURITY ON THE ADOPTION OF MOBILE MARKETING TRANSACTIONS AMONG SOUTH AFRICAN TERTIARY STUDENTS

Author

GIFT TARUWANDIRA DONGA

Date Issued

JULY, 2020

Sahara Publishing and Printing provides a range of editing, translation and manuscript services for researchers and publishers around southern Africa. For more information about our company and services, please visit www.saharapublishing.co.za
If you have any questions or concerns about this edited document, please contact Sahara Publishing and Printing at info@saharapublishing.co.za