

https://dspace.org/

Adoption strategies [for] mobile payment services in South Africa

Balabanoff, Garth Andrew

2015
http://hdl.handle.net/10539/19978

Downloaded from a DSpace repository. https://dspace.org/

Adoption Strategies Mobile Payment Services in South Africa

Garth Balabanoff

A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2015

ABSTRACT

The purpose of this study focused on examining consumer behaviour and acceptance towards adopting mobile payment services in Johannesburg, South Africa. Mobile payments are in an emerging phase, but offer potential benefits to both consumers and industry at large. Although adoption strategies around internet banking and cell phone banking have been explored in various parts of the world, adoption strategies specifically around mobile payment services in a South African context has not been adequately researched.

The methodology used in this research study was quantitative; whereby paper based, self-dispensed questionnaires were to individuals within the Johannesburg area and those on campus at the University of Witwatersrand. Respondents include din this study were aged between 18 and 65 years. A pilot study of ten respondents was conducted to ensure validity and reliability of the questionnaire. Following this, the research was then conducted to a sample size of 215 respondents. Due to time constraints, this study made use of convenience sampling.

Data collected from the questionnaires was analysed using statistical analysis to investigate the relationship between the variables used in the research model, this being a modified version of the Decomposed Theory of Planned Behaviour (TPB) model – The decomposed TPB model is successful in predicting and explaining human behaviour across various platforms and breaking outcomes down into specific dimensions. In addition, the decomposed TPB model is most suitable for steering decision makers towards the implementation of innovations. The decomposed TPB model will provide insight into understanding consumers' individual attitudes, subjective norms and perceived behavioural control, which ultimately influences the likelihood of consumers using mobile payment services.

Results found in this research paper can ultimately conclude that the proposed theoretical framework model supports the results found in this research study. The findings of this research, which was focused towards, *attitude, perceived behavioural control and subjective norms* do have a significant relationship on the *intention to adopt* mobile payment services. It must be noted that *subjective norms* and *self-efficacy*, followed by the *attitude* towards the advantages towards of mobile payment services, had the strongest relationships on the intention to adopt. In terms of the hypotheses set and tested, all resulted as postulated.

In conclusion to this study the contribution of this research provides mobile payment service providers, the banking industry, marketers, retailers and academics with the factors that encourage consumers to adopt mobile payment services and to utilise the research to exploit the conversion rate of customers towards adopting mobile payment services. Further to this potential bankers and marketers abroad could utilise the established results found in chapter six, to capitalize on mobile payment services adoption opportunities in their own markets.

DECLARATION

I, GARTH ANDREW BALABANOFF, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfillment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

GARTH ANDREW BALABANOFF

Signed at ……

On the …….. day of …… 20…..

ACKNOWLEDGEMENTS

First and foremost, I wish to express my sincerest gratitude and appreciation to Wits Business School for awarding me a full bursary in order to complete my MBA – a lifelong dream. I would further like to extend this gratitude and appreciation to my wonderful parents for all the opportunities and experiences these five years of studies have brought. Your love, time, input, support and encouragement is what afforded me the ability to complete this research and MBA to the best of my ability.

I had the privilege of studying under supervision of Mr. Laurence Beder who provided me with critical insights and an opportunity to broaden my knowledge in making this a great study – thank you. I wish to also acknowledge both Professor Gregory Lee and Anthony Stacey for their time and advise which has been invaluable. In addition, it is fitting to acknowledge my classmates of 2014, well done team!

A special thanks to my family and friends for encouraging me to challenge myself in completing my MBA degree. Last but not least, to my beautiful girlfriend Bronwyn, you a pillar of strength in all that I do. Your love, encouragement, positive attitude, assistance and time afforded in editing this dissertation is so appreciated.

TABLE OF CONTENTS

ABSTRACT ..... **i**

DECLARATION ..... **iii**

ACKNOWLEDGEMENTS ..... **iv**

LIST OF FIGURES ..... **viii**

LIST OF TABLES ..... **ix**

LIST OF ABBREVIATIONS ..... **x**

1 INTRODUCTION **1**

1.1 Purpose Of The Study **1**

1.2 Context Of The Study **3**

1.3 Problem Statement **7**

1.3.1 Main Problem 7

1.3.1.1 Sub Problems 7

1.4 Significance of the Study **7**

1.5 Delimitations of the Study **8**

1.6 Definition of Terms **9**

1.7 Assumptions **9**

2 LITERATURE REVIEW – MOBILE PAYMENTS & TECHNOLOGY **11**

2.1 Introduction **11**

2.2 Literature Review (Definition of Topic) **11**

2.2.1 Mobile Devices Definitions 12

2.2.2 Definition of a Cell Phone 12

2.2.3 Mobile Payments (m-Payments) Defined 13

2.2.4 Mobile Payment Services In South Africa 19

2.3 Adoption **22**

2.3.1 Adoption Model Frameworks 22

2.3.1.1 Technology Acceptance Model (TAM) 23

2.3.1.2 Theory of Reasoned Action (TRA) 24

2.3.1.3 Theory of Planned Behaviour (TPB) 25

2.3.1.4 Proposed Theoretical Model 29

2.4 Attitude **31**

2.4.1 Hypothesis 1A 32
2.4.2 Hypothesis 1B 32
2.5 Perceived Behavioural Control 32
2.5.1 Hypothesis 2A 33
2.5.2 Hypothesis 2B 33
2.6 Subjective Norms 33
2.6.1 Hypothesis 3A 33
2.7 Intention to Adopt 34
2.8 Conclusion of Literature Review 34
3 RESEARCH METHODOLOGY 35
3.1 Research Methodology / Paradigm 35
3.2 Research Design 35
3.3 Population and Sample 36
3.3.1 Population 36
3.3.2 Sample and Sampling Method 36
3.3.3 Participant and Descriptive Statistics 39
3.4 The Research Instrument 44
3.5 Procedure for Data Collection 45
3.6 Data Analysis and Interpretation 46
3.7 Validity and Reliability 48
3.7.1 Validity 48
3.7.1.1 External validity 49
3.7.1.2 Internal validity 49
3.7.2 Reliability 49
3.8 Pilot Study 50
3.9 Testing Factor Structure of Variables 51
3.9.1 Confirmatory Factor Analysis 51
3.9.2 Structural Model 58
4 PRESENTATION OF RESULTS 59
4.1 Introduction 59
4.2 Descriptive Statistics & Correlations 59
4.3 Structural Equation and Moderation Model 62
4.3.1 Proposed Theoretical Intention to Adopt Model 62
4.3.2 Alternative Model Produced by SEM (Model 2) 67
4.3.3 Comparison of Models 69
4.4 Regression Analysis Results 71

4.4.1 Regression Results Pertaining to Attitude Construct 72
4.4.2 Regression Results Pertaining to Perceived Behavioural Control 73
4.4.3 Regression Results Pertaining to Subjective Norms 74
4.5 Summary of analyses 75

5 DISCUSSION OF RESULTS 76
5.1 Introduction 76
5.2 Discussion pertaining to the Attitude Construct 78
5.2.1 Discussion pertaining to the Perceived Behavioural Control Construct 80
5.3 Discussion pertaining to the Subjective Norms Construct 82
5.4 Conclusion 84

6 CONCLUSIONS & RECOMMENDATIONS 85
6.1 Introduction 85
6.2 Conclusion of the study 85
6.3 Recommendations & Managerial Implications 87
6.4 Suggestions for further research 90
6.5 Limitations of the Study 91
6.6 Conclusion 92

7 REFERENCES 94

APPENDIX A 108

LIST OF FIGURES

FIGURE 2.1: MOBILE PAYMENT CHARGED TO MONTHLY SUBSCRIPTION 15
FIGURE 2.2: MOBILE PAYMENT VIA SMS 16
FIGURE 2.3: MOBILE PAYMENT VIA NEAR FIELD COMMUNICATION 16
FIGURE 2.4: MOBILE PAYMENT VIA QR CODE 17
FIGURE 2.5: ADD-IN DEVICE 17
FIGURE 2.6: TECHNOLOGY ACCEPTANCE MODEL (TAM) 24
FIGURE 2.7: THEORY OF REASONED ACTION (TRA) 25
FIGURE 2.8: PURE DECOMPOSED THEORY OF PLANNED BEHAVIOUR 28
FIGURE 2.9: FRAMEWORK FOR THE ADOPTION OF MOBILE PAYMENT SERVICES IN JOHANNESBURG, SOUTH AFRICA 30
FIGURE 3.1 CFA MAJOR PARAMETERS 57
FIGURE 4.1 INTENTION TO ADOPT MODEL SEM AND STANDARDIZED PATH CO-EFFICIENTS (MODEL 1) 64
FIGURE 4.2 DECOMPOSITION EFFECTS TABLE FOR THE INTENTION TO ADOPT MODEL 65
FIGURE 4.3 ALTERNATIVE SEM MODEL WITH ATTITUDE IN THE MIDDLE AND STANDARDIZED PATH CO-EFFICIENTS (MODEL 2) 67
FIGURE 4.4 DECOMPOSITION EFFECTS TABLE FOR THE ALTERNATIVE SEM MODEL WITH ATTITUDE IN THE MIDDLE (MODEL 2) 68

LIST OF TABLES

TABLE 3.1 GENDER OF RESPONDENTS AND FREQUENCY OF RESPONDENTS WHO HAVE HEARD ABOUT AND USE MOBILE PAYMENT SERVICES.....39
TABLE 3.2 GENDER OF RESPONDENTS AND FREQUENCY OF RESPONDENTS WHO HAVE HEARD ABOUT AND USE MOBILE PAYMENT SERVICES.....40
TABLE 3.3 CHI-SQUARED TEST TESTING THE RELATIONSHIP BETWEEN USERS AND NON-USERS OF MOBILE PAYMENT SERVICES FOR RESPONDENTS OF DIFFERENT GENDERS.....41
TABLE 3.4 AGE AND FREQUENCY OF RESPONDENTS WHO HAVE HEARD ABOUT AND USE MOBILE PAYMENT SERVICES.....42
TABLE 3.5 RESPONDENTS MAKE OF CELL PHONE.....43
TABLE 3.6 EXECUTIVE SUMMARY OF CRONBACH ALPHA CALCULATIONS FOR THE FULL- & PILOT- STUDY.....52
TABLE 3.7 STRUCTURAL EQUATION MODEL ASSUMPTIONS.....53
TABLE 3.8 STRUCTURAL EQUATION GLOBAL MODEL FIT STATISTICS.....53
TABLE 3.9 SUMMARY TABLE OF THE GLOBAL FIT STATISTICS RESULTS FOR THE INTENTION TO ADOPT MODEL.....56
TABLE 4.1 DESCRIPTIVE STATISTICS AND CORRELATIONS ..**ERROR! BOOKMARK NOT DEFINED.**
TABLE 4.2 MODEL FIT COMPARISONS .....**ERROR! BOOKMARK NOT DEFINED.**
TABLE 4.3 REGRESSION ANALYSIS RESULTS.....**ERROR! BOOKMARK NOT DEFINED.**

LIST OF ABBREVIATIONS

APP	Application
NFC	Near Field Communication
MPS	Mobile Payment Services
SEM	Structural Equation Modeling
SMS	Short Message Service
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
QR Code	Quick Response Code

1 INTRODUCTION

1.1 Purpose Of The Study

The purpose of this study will focus on examining consumer behaviour and acceptance towards adopting mobile payment services in Johannesburg, South Africa. Mobile payments are in an emerging phase, but offer potential benefits to both consumers and industry at large (Flood, West, & Wheadon, 2013; Schierz, Schilke, & Wirtz, 2010). As stated by Arvidsson (2014) and Zhou (2013), there is a need for constant research in understanding consumer behaviour and acceptance in the area of mobile payment services.

When comparing the number of 2013 cell phone subscribers to fixed line users in South Africa a noticeable variance is evident. In 2013, results revealed that 29 million South Africans use mobile phones compared to 3.9 million South Africans using fixed lines (Goldstuck, Edwards, & Singh, 2014; International, 2014; Lascaris, 2012). It is because of this increased and saturated mobile market that we have seen the extreme growth of mobile banking applications, mobile technology and mobile payment methods. This increase is coupled with several benefits that mobile payment services bring to the consumer, such as increased functionality, convenience, productivity improvements and better customer experience and service (Pranata, Athauda, & Skinner, 2013; Zhou, 2013).

Although adoption strategies around internet banking and cell phone banking have been explored in various parts of the world, adoption strategies specifically around mobile payment services have not been adequately researched (Jaruwachirathanakul & Fink, 2005; C. Kim, Mirusmonov, & Lee, 2010; Mallat, 2007; Zmijewska, Lawrence, & Steele, 2004a). As such, the purpose of study will focus on examining what influences user adoption of mobile payment services in Johannesburg, South Africa, from a consumer behaviour perspective.

Today's consumer is surrounded by the digital age in which technologies, such as internet, mobile smartphones and tablets have accelerated and fundamentally changed daily innovation, engagement, exchanges, adoption, marketing and consumer behaviour attitudes. Previous research has shown that countries and organizations can be the catalysts and providers of modern technological tools, however unless consumers are willing to change behaviour and adopt, accept and utilise such tools the conversion rate shall be minimal. This landscape has ultimately created new opportunities and techniques in which consumers and organizations are able to interact (Al-Khouri, 2013; Dapp, Stobbe, & Wruuck, 2012).

Mobile banking and mobile payments is said to be one of the fastest and significant growing markets which is considered to have the same penetration rate as the introduction of cell phones (Alafeef, Singh, & Ahmad, 2011; Chase, 2012; Maduku, 2012; Püschel, Mazzon, & Hernandez, 2010). Currently, in the United States, there are over 200 million credit and debit card transactions amounting to $12 billion a day; this equates to $4 trillion in card transactions a year (Reardon & Tibken, 2014). Further to this, Gupta (2013) and Sherman (2014) state that by 2017 $1.3 trillion in mobile banking payments will be transacted by 900 million people globally. Likewise, Holden (2014) states that payments via mobile devices will amount to $507 billion in 2014. From a South African perspective, Warricker (2014) highlights that mobile payments in South Africa is expected to amount to over R83 billion by 2017, this being a 115% growth rate. The emergence of mobile payment technology is predicted to have a significant impact on the global banking, payment and retail industry. As such exponential business opportunities exist for innovative corporates and lateral thinking entrepreneurs. This study shall also provide other developing countries with findings to explore similar business prospects. In addition the academic will benefit from the literature review and shall be in a position to examine the factors influencing consumer behaviour towards adopting mobile payment services.

1.2 Context Of The Study

Since the introduction of mobile platforms the consumer market has grown exponentially; breaking technology adoption and usage records (Keshav, 2005; Van Biljon & Kotzé, 2007). Compiled in 2012, statistics show that mobile phone ownership and usage has encouraged global sales to total 1.75 billion mobile units along with 472 million smart phone sales against 2011's smart phone sales of 477 million units (Power, 2013; vander Meulen & Rivera, 2013). In the last thirteen years, the global number of mobile phone subscribers have risen from 750 million, to 6.7 billion (Ericsson, 2014; Schmidt & Cohen, 2013). In Africa, the 2013 statistics indicate that there are 821 million mobile phone subscribers. These phenomenal sales have driven marketers and business leaders towards being focused on providing consumers with mobile payment needs (Kamuti, 2013; Kshetri & Acharya, 2012; ScreenAfrica, 2014).

Mobile technology devices are a medium upon which consumers have become reliant, not only for communication but in addition for their daily lifestyle requirements. Mobile platforms such as smart phones and tablets have forced developers on every continent to create suitable applications to meet the needs of current consumers. This has steered marketers to refocus their marketing strategies to take advantage of consumer spending (Rodríguez-Ardura, Ryan, & Gretzel, 2012).

Smartphones and tablets are reshaping the need of a consumer's experience and how business connects with these consumers via content and/or media. These opportunities exist for most organizations and industries, affording marketers the opportunity to create campaigns across multiple platforms. Conversely, the disadvantage of not adapting to consumer usage patterns in a multi platform environment is likely to result in the loss of market share and plummeting sales (Bauer, Barnes, Reichardt, & Neumann, 2005; Dapp et al., 2012).

A mobile payment, otherwise referred to as m-payments, is simply explained as using a mobile device, as a payment device ie a payment terminal (Chase, 2012). Similarly, Zhou (2013) and Dahlberg, Mallat, Ondrus, and Zmijewska (2008) describe a mobile payment as when a user uses a mobile phone to conduct payment for bills, goods and / or services. Further to this, Flood et al. (2013) and Kshetri and Acharya (2012) defines mobile payments as a multitude of financial transactions originating from a mobile device. Adding to this, mobile payments refer to the facilitation and transfer of money through the use of mobile devices (Mogale, 2013). The major advantage of mobile payments is that users can conduct payments conveniently using their smartphones without the need to carry credit cards or cash as well as cost savings (Gupta, 2013; Schierz et al., 2010; Zhou, 2013; Zmijewska et al., 2004a). Having said this, mobile payment services can therefore be defined as the service that facilitates payment functionality.

According to (Pousttchi & Schurig, 2007), recent findings suggest that the mobile phone is regarded as a trusted device to be used by consumers for the adoption of electronic payments. Similarly mobile payments are mooted to be the leading application in the financial sector and the number one application in the arena of mobile communications (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014). Mobile payments is defined as a present-day payment execution strategy and is forecasted to be one of the most successful and highly profitable business-to-consumer service experiences.

In the last two decades there has been a noticeable shift in banking development channels and payment facilities, these being determined not only by banks or governments, but more specifically by consumers' attitudes and acceptance thereof. Globally, banks have had to constantly innovate to provide convenient and reliable services to their demanding and discerning customers (Bankole, Bankole, Brown, & Cloete, 2012; Bauer et al., 2005; Brown, Cajee, Davies, & Stroebel, 2003; Gupta, 2013; Jaruwachirathanakul & Fink, 2005; Pikkarainen, Pikkarainen, Karjaluoto, & Pahnila, 2004; Tan & Teo, 2000). Linked to this growth, mobile payments are the next advancement in providing convenient, secure and reliable services to consumers. As a result, this study's

findings on mobile payment services: consumer behaviour, acceptance and adoption strategies may provide useful insights for the South African market, other developing countries as well as other global players.

The use of technology in the banking and retail environment has become more advanced over the last decade (Bankole et al., 2012; Cheah, Teo, Ooi, & Wong, 2013; Gupta, 2013; Salehi & Alipour, 2014). Technology for use by the consumer has been limited to Internet and cell phone use (Jaruwachirathanakul & Fink, 2005). It is only in the last four years that mobile payment services have come to the fore through innovative lateral thinking service providers. As a result limited research is available around mobile payment services and the payment mechanisms which give rise to an opportunity of further study for bankers, retailers and businesses to make informed strategic decisions.

Historically the consumers were forced to perform their payment functions by physically using cash or card facilities at retail outlets, this being inconvenient from a time, safety and user experience perspective (Mlitwa & Tshetsha, 2012). Through innovation and technological advancement, the ability to perform banking and payment functions electronically has become significantly easier for the consumer (Jaruwachirathanakul & Fink, 2005). Mobile payment services have taken this ease of banking and transacting to another level. As highlighted by Virgillito (2013), this methodology of transacting is the way that 21st century banks will be forced to change their customer focus or face the consequences of a regressive competitive edge.

The emergence of this new transacting platform, i.e mobile payment services, have come about through developers having to innovate due to a global landscape of increased crime, fraud, technological advancement and pressure from the consumer and businesses alike. In addition, innovative bankers, retailers and marketers have been driven by consumers to constantly add value to their offerings. The ease of transacting, being a primary value add, has steered bankers and retailers to seek alternative transacting methodologies. As stated by the Wortham (2013), *“a truly mobile wallet has long been described as*

imminent. But it remains elusive… most have been a disappointment or have not yet worked well enough for mainstream adoption."

Mobile payment services and payment methods achieve this objective as the consumer is now in a position to perform transactions easily and quickly at little or no expense. Bankers and retailers see this as another gateway for improving bottom line, as consumer convenience creates increased transactions (Virgillito, 2013).

In addition, the attraction of cell phone / mobile banking, particularly in Africa where disparities between urban and rural are so blatant, is that financial activities such as fund transfers are attractive as these banking services can be performed at anytime or any place convenient to the user (Amin, 2008). Similarly Tashmia and Khumbula (2011) indicated in their research, that literally millions of individuals, from across the globe, not only in South Africa, specifically in emerging markets, were also excluded from banking services due to being part of the developing world. In reality these populations are subjected to barriers of entry such as cost, location, education, access to tangible banking and transportation. With the advent of mobile payment services, these individuals now have access to banking transactions and are able to participate in the financial services environment. Once again, due to the urban versus rural geography, the benefit minimizes time and distance challenges for the user as well as overhead and related costs for the provider.

The findings of this research aim to provide the banking industry, marketers and academics the factors that encourage consumers to adopt mobile payment services. In addition, exercise the research with a view to exploit the conversion rate of customers towards adopting mobile payment mechanisms as well as encourage retailers to adopt such payment methods. These findings will not only provide useful insights for the South African market, but also other developing and developed countries.

1.3 Problem Statement

1.3.1 Main Problem

To identify and assess the consumer behaviour factors that impact upon the adoption of mobile payment services in the South African market.

1.3.1.1 Sub Problems

The first sub-problem is to assess the Attitude towards the Intention to Adopt mobile payment services. (Dependent variable)

The second sub-problem is to assess the Perceived Behavioural Control towards the Intention to Adopt mobile payment services. (Dependent variable)

The third sub-problem is to assess the Subjective Norms towards the Intention to Adopt mobile payment services. (Dependent variable)

The fourth sub-problem is to assess the Attitude, Perceived Behavioural Control and Subjective Norms towards the Intention to Adopt mobile payment services. (Independent variable)

1.4 Significance of the Study

With the extreme growth of mobile phone adoption, mobile application advancement, m-commerce, cell phone banking, and the rise of mobile payment services, organisations may by default, naturally adopt and move rapidly towards the use of new and innovative mobile payment mechanism. This perspective is strengthen by Gupta and Herman (2012) who state that mobile transacting and banking adoption is significantly faster and greater than that of online banking. Further to this, Wiggill (2014) states that mobile payments is the next evolution of payment methodology, where the South African market is an opportune arena. Having said that, mobile payment services remains in its infancy (C. Chen, 2013; C. Kim et al., 2010; Schierz et al., 2010; Zhou, 2013).

With 7 billion people in the world, 6 billion mobile devices and only 2 billion using banking facilities, it is therefore imperative that stakeholders such as banks, third party developers and mobile network operators take an active role in the mobile banking and transacting revolution in order to exploit opportunities (Gupta, 2013).

This study distinguishes consumer behaviour in examining the factors towards adopting mobile payment services. The value of this research may ultimately provide marketers, academics, retailers and bankers, the understanding on how to adopt and market mobile payment services to new and existing consumers. The ambition of this study is therefore to quantitatively derive results that aid towards the contribution of literature in relation to mobile payment services. As mobile technology is transforming global banking and the payment industry Gupta (2013), a Harvard Business School Professor, highlights that it is critical that stakeholders in this environment have a flexible and innovative attitude with a mandate to develop a deeper understanding of local markets and its customers, specifically in the field of mobile payments.

1.5 Delimitations of the Study

From the outset, this study is interested in establishing attitudes towards consumer behaviour, acceptance and adoption towards mobile payment services in South Africa. Therefore the following limitations can apply to this study:

Firstly, this study will apply a modified version of the decomposed Theory of Planned Behaviour model which makes use of four main constructs (attitude, perceived behavioural control, subjective norms and intention to adopt), which incorporates five factors. These factors are specifically used to examine what influences consumer behaviour towards adopting mobile payment services. Having said this, there may be additional factors that influence the adoption of mobile payment services that are not examined in this study.

Secondly, due to time and monetary constraints the sample size that will be used in this study will be limited and will make use of convenience sampling. Due to other sampling methods being suitable, the sampling method used in this study could be viewed as a limitation. Similarly, the time frame of the collection of data is a delimitation were the time frame is delimited to a one month period (November 2014). This therefore limits the magnitude of the study.

Thirdly, questionnaires completed by respondents, to the best of their ability, may not have been completed truthfully due to the lack of topic understanding or their ability to understand or complete the questionnaire.

Lastly, this research included users and non-users focused only towards mobile payment services. This study was limited to specific age groups these being between 18 and 65 years.

1.6 Definition of Terms

A mobile payment is simply explained as using a mobile device, as a payment device ie a payment terminal (Chase, 2012; C. Kim et al., 2010). Extending this further, both Dahlberg et al. (2008) and Zhou (2013) describe a mobile payment as when a user uses a cell phone to conduct a payment for either bills, goods and / or services. Further to this, Flood et al. (2013) and Kshetri and Acharya (2012) defines mobile payments as a multitude of financial transactions originating from a mobile device.

App: An app (abbreviation for "application") is a type of specific and customized software that is downloaded and installed on either smartphones or tablets.

1.7 Assumptions

The assumptions made in this study is that all respondents will answer and provide accurate data when completing questionnaires which will provide the

basis for thorough quantitative analysis to be performed. Further to this, the assumption of actually adopting such a methodology (mobile payment services) in a developing country may prove difficult to adopt due to South Africa's contextual and demographic factors.

2 LITERATURE REVIEW – MOBILE PAYMENTS & TECHNOLOGY

2.1 Introduction

The previous chapter introduced the study of the research. This chapter provides an understanding and in-depth analysis of the constructs and hypotheses that make up the study. Further to this, relations of these constructs are too provided.

This will be done through an evaluation of previous literature and studies which have been done on mobile banking and mobile payments but not on mobile payment services consumer behaviour, acceptance and adoption. In addition, the literature review will explore the background of mobile payments specifically around mobile payments within a South African context. The literature review will, in essence, provide a structured and logical framework for this research assignment.

2.2 Literature Review (Definition of Topic)

During the literature review, it was found that numerous studies focused on either internet, cell phone / mobile banking but not specifically on mobile payment services consumer behaviour adoption. In prior years, a substantial amount of research has been done on the acceptance and adoption of internet, mobile banking and mobile payments (Bankole et al., 2012; Brown et al., 2003; Crabbe, Standing, Standing, & Karjaluoto, 2009; Dapp et al., 2012; Khraim, Shoubaki, & Khraim, 2011; C. Kim et al., 2010; Laforet & Li, 2005; Laukkanen, 2007; Laukkanen, Sinkkonen, Laukkanen, & Kivijarvi, 2008; M. S. Lee, McGoldrick, Keeling, & Doherty, 2003; Luarn & Lin, 2005; Maduku, 2012; Mlitwa & Tshetsha, 2012; Pedersen, 2005; Polatoglu & Ekin, 2001; Püschel et al., 2010; Schierz et al., 2010; Shambare, 2011, 2013; Sulaiman, Jaafar, &

Mohezar, 2007; Suoranta & Mattila, 2004; Van Biljon & Kotzé, 2007; Zhou, 2013) in a multitude of countries which is available through various library journals, unpublished work, academic textbooks, organisational research, publications and government reports.

As the primary focus of the above studies were on mobile banking and internet banking and not on mobile payment services; it was therefore evident that these studies could not demonstrate sufficient information on consumer behaviour, acceptance and the adoption thereof in the South African mobile banking payment context.

Having said this, an opportunity exists to explore the platform of consumer behaviour, acceptance and adoption strategies around mobile payment services. Once understood, a clear understanding of these factors will enable both financial, retail and telecommunication service providers with new innovative marketing strategies and lucrative business opportunities to take advantage of organic growth and profiteering.

2.2.1 Mobile Devices Definitions

From the outset, a mobile device is defined as a “pocket sized computing device” which exhibits features such as small screen size, reduced keyboard or touch screen functionality, examples include mobile phones, laptops, tablet PC’s, MP3 players, calculators and other forms of technology driven devices (Huang, 2008; Paelke, Reimann, & Rosenbach, 2003). This is in accordance with Bailey (2004), where a mobile device refers to an object that is specifically designed to be used whilst carried.

2.2.2 Definition of a Cell Phone

A cell phone, or otherwise referred to as a cellular device, telephone, mobile phone or mobile, is defined as a portable “electronic telecommunication device that uses radio waves or satellite transmission to communicate over a wireless analog or digital network” (Huang, 2008) in order to transmit and receive voice, video and data. Minimum requirement features of cell phones is

that they enable users to send and receive voice, Short Message Services (SMS), Multimedia Message Services (MMS) as well as web browsing. More modern day cell phones provide users with email, installed software applications and camera functionality (Al-Khouri, 2013).

That said, more recent phones are now considered ‘smart phones’. A smart phone is referred to as a portable mobile device that has the combined function of both a cell phone and a PDA (Personal Digital Assistant), or, alternatively, a cell phone that runs on modern-day operating systems that are permanently connected to the internet. Typical features of a smart phone include sophisticated internet browsing functionality, backlit user interface, Wi-Fi and Bluetooth capability, significant sized RAM & ROM, an advanced operating system which supports running applications and in some cases the ability to insert added memory (S.-W. Chen, Yang, & Liu, 2011; Holzinger, Nischelwitzer, & Meisenberger, 2005; Huang, 2008; Yu & Conway, 2011).

2.2.3 Mobile Payments (m-Payments) Defined

Society today has been gripped with the increased advantage of mobility and mobility advancements (Schierz et al., 2010). The evolution of mobile technology has presented a further benefit to consumers and industry at large with the introduction of mobile payment services. Although in its evolutionary stages, there is an unprecedented amount of hype around mobile payments, Chase (2012) regards this hype as “the next big thing”. As a result, the acceptance of a mobile payment presents immediate and exponential benefits as well as business opportunities for merchants, banks, retailers and application developers (Zhou, 2013).

A mobile payment is simply explained as using a mobile device, as a payment device ie a payment terminal (Chase, 2012; C. Kim et al., 2010). Similarly, Zhou (2013) and Dahlberg et al. (2008) describe a mobile payment as when a user uses a cell phone to conduct a payment for either bills, goods and / or services.

Further to this, Flood et al. (2013) and Kshetri and Acharya (2012) defines mobile payments as a multitude of financial transactions originating from a mobile device. Adding to this, mobile payments refer to the transfer of money through the use of mobile devices (Mogale, 2013). The major advantage of mobile payments is that users can conduct payments conveniently using their smartphones without the need to carry credit cards or cash as well as cost savings (Gupta, 2013; Schierz et al., 2010; Zhou, 2013; Zmijewska et al., 2004a). Having said this, mobile payment services can therefore be defined as the service that facilitates payment functionality.

With this new concept of mobile payments there is a plethora of different technologies that facilitate this mechanism of payment. Flood et al. (2013) states that mobile payments must therefore not be categorized or thought of as a single payment type as each method of payment offers different mechanisms and benefits. Of these different mobile payment technology methods the five typical methods include; charging a payment to the mobile subscription, short message service (SMS), near field communication, a device add-in or through a QR code based application. The differences of each are explained below.

Charging a payment to a subscribers monthly mobile device's account, is where a consumer makes a purchase using their mobile device and the charge appears on the subscribers monthly invoice. A short message service (SMS) payment is where a text message on a mobile phone is used to conduct transactions where a text message payment instruction is sent via the mobile phone. In this case, a text message costs a certain amount and is charged to the users monthly subscription (Alafeef et al., 2011). Near field communication (NFC) transactions is where wireless payment technology is integrated in the mobile device handset enabling a payment to be made by either waving or tapping the mobile handset near a wireless card reader (Chase, 2012). An add-in device is special card reader device that plugs into a smart phone device's head phone jack. A merchant will then use the mobile device as a payment terminal where the card is swiped through the card reader and debits the amount of the purchase transaction to the consumers

relevant bank account (Ondrus & Lyytinen, 2011). Lastly, payments made through the use of a QR code based application (abbreviation for “Quick Response”) uses an individual’s smartphone device to scan a QR code which then facilitates a payment. In order for this payment to be processed, an individual is not required to belong to any specific bank, however uses their verified Visa or MasterCard card to process the payment (Rouillard, 2008).

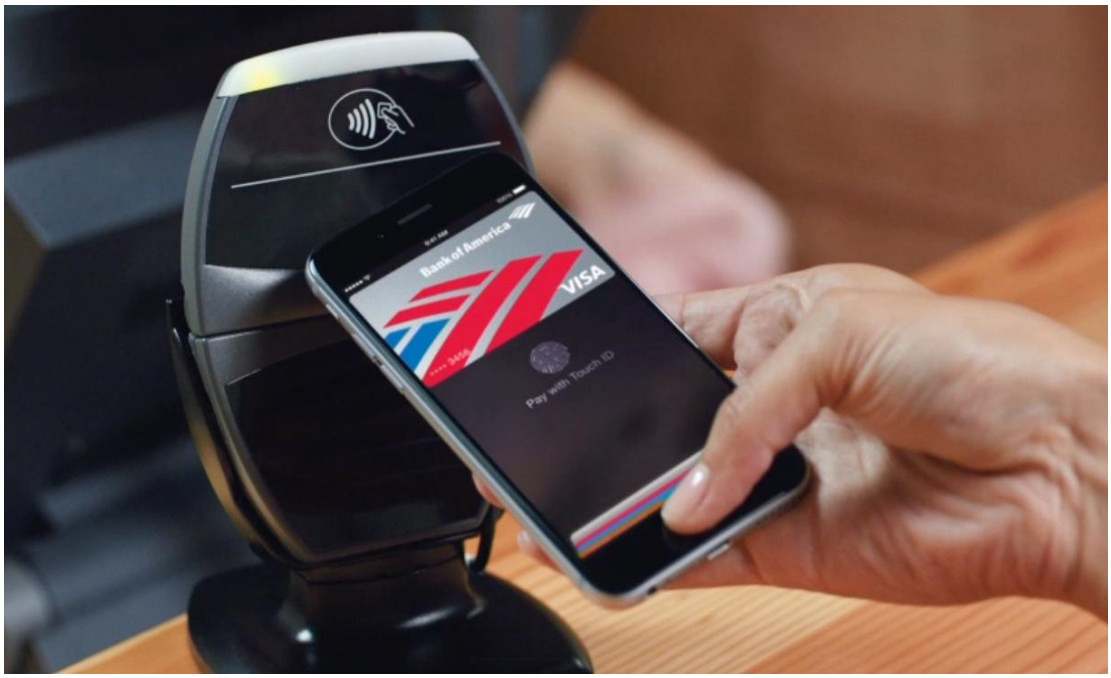
These four most used mobile payment service methods (charging a payment to the mobile subscription, short message service (SMS), near field communication or through a QR code based application) are diagrammatically explained below:



Figure 2.1: Mobile Payment Charged to Monthly Subscription

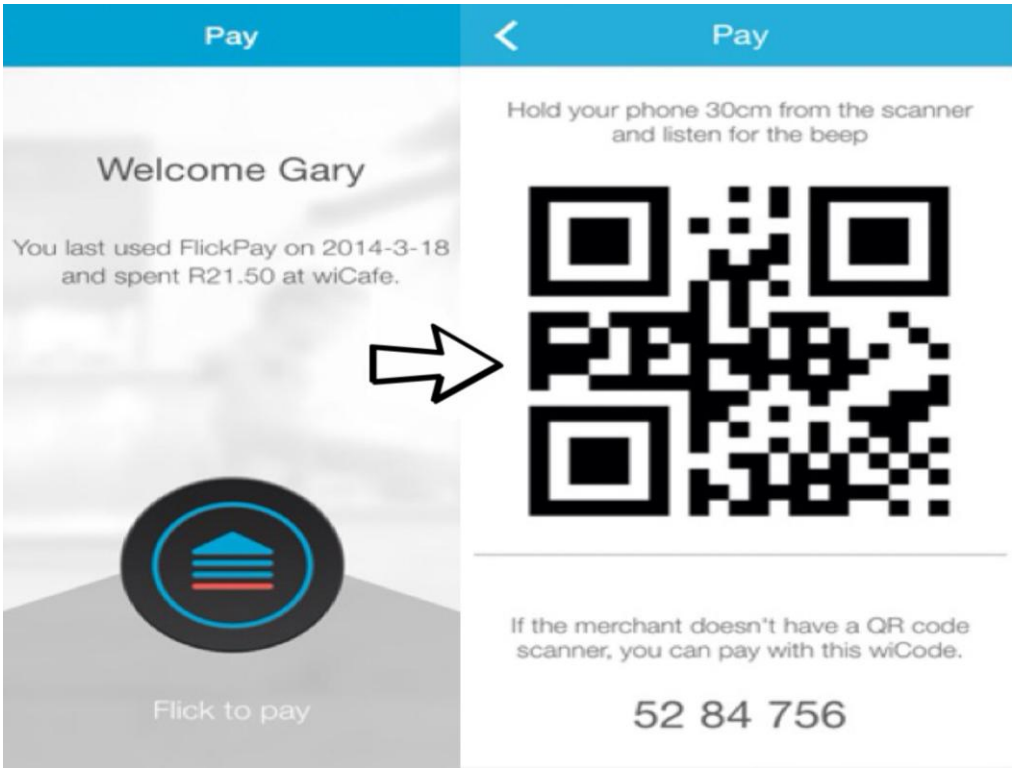


Figure 2.2: Mobile Payment via SMS



Source: (Apple, 2014)

Figure 2.3: Mobile Payment via Near Field Communication



Source: (FlickPay, 2014)

Figure 2.4: Mobile Payment via QR Code



(Absa, 2014)

Figure 2.5: Add-In Device

With the above in mind, it must be highlighted that the purpose of this study is to not investigate or understand the different mobile payment services technologies that facilitate the adoption of mobile payment services, but rather to understand the consumer behaviour of what influences user adoption of payment services in Johannesburg, South Africa.

With the growth of mobile payments, mobile banking and in general growth in m-commerce, the mobile community is poised to adopt and move rapidly towards the use of new and innovative mobile applications (Harri, Harri, Virpi, & Arieste, 2003).

Mobile payments presents new opportunities for the banking industry as it allows financial institutions and third parties to deliver financial services to both banked and unbanked customers, whether in South Africa or abroad (Brown et al., 2003; Maduku, 2012; Mlitwa & Tshetsha, 2012; Tiwari, Buse, & Herstatt, 2006). Adding to this, mobile payments refer to the transfer of money through mobile devices (Mogale, 2013).

However, it must be noted that mobile commerce and mobile payments are not the same and cannot be used interchangeably. Mobile commerce, known as m-commerce, is defined as a value-added service whereby individuals can conduct reliable and secure transactions through mobile devices typically on a mobile browser or application, either in proximity or remotely (Chase, 2012; Mogale, 2013; Petrova, 2004). Similarly, Jen-Her and Shu-Ching (2005) define m-commerce as a financial transaction processed via a telecommunication network typically on a mobile browser or application. M-commerce provides significant value to consumers through its ability to provide convenience and flexibility where business transactions can be done electronically and independently regardless of place or time (G. Kim, Shin, & Lee, 2009). M-commerce relies on the intertwined relationships between various regulatory bodies, banks, telecommunication networks, technology organisations, retailers and others (Mogale, 2013). That said, user resistance exists within m-Commerce due to limited screen sizes, resolutions and network stability. In addition, both m-commerce and mobile banking are

susceptible to high risk of exposing personal information (G. Kim et al., 2009; Mattila, 2003; Siau & Shen, 2003). Currently in South Africa, new legislation around the protection of personal information is being promulgated. This Act will be called POPI (Republic of South Africa, 2009).

2.2.4 Mobile Payment Services In South Africa

As stated by Warricker (2014), persuading more South African consumers to use their mobile phone to make payments for goods and / or services, whether this be a cup of coffee, grocery shopping or a car cash, this presents significant opportunities. These opportunities extend to stimulating South Africa's developing economy and greater financial inclusion.

Whilst often referred to as a third world, developing country, Tashmia and Khumbula (2011) highlights that South Africa's banking services and infrastructure remain amid the best globally. This excellence extends further into South Africa's highly regulated banking industry procedures, standards and policies. A recent example is First National Bank (FNB) being acknowledged at the 2012 BAI-Finacle Global Banking Innovation Awards as the most innovative bank in the world. This award honoured FNB's culture of innovation and their advancement of retail banking. In addition, FNB was also noted for empowering all of its business units to be innovative (Bank Administration Institute, 2012; First National Bank, 2012).

The New Age (2013) most recent statistics show that 63 million South African cell phone subscribers are registered on the South African mobile networks. This finding is exceptionally interesting as (Statistics South Africa, 2011), in the latest nationwide census highlights the population of South African at 51.7 million.

Literature suggests that South African consumers favour conducting their banking transactions (including mobile payments) via cell phones more so than via any other method (Shambare, 2013). A quarter of the South African

banking market make use of internet banking as opposed to a third of this market who prefers mobile banking services (Shambare, 2013). In 2011, statistics revealed that 21% of South Africans make use of cell phone banking services (Hutton, 2011; Mail & Guardian., 2011), compared to 31% in 2012 (Tubbs, 2012; World Wide Worx, 2012).

Globally mobile payment services are in an emerging phase, where South Africa's mobile payments usage is dominantly centered around money transfer through services such as MTN's mobile mobile, m-PESA, FNB's eWallet, or even the partnerships between Spar and Standard Bank as well as with the Capitec Bank and Checkers, which also offer low-cost banking solutions (Bhengu, 2013; Harris, 2012; Moodycliffe, 2014; MTN, 2012). However the emergence of mobile payment services – using your cell phone to pay for goods and / or services at a retail outlet – is in its infancy, specifically within a South African context. As a result, the aim of this study is focused around examining what influences user adoption of mobile payment services in Johannesburg, South Africa, from a consumer behaviour perspective.

As highlighted above, there are five main types of mobile payment services these being; charging a payment to the mobile subscription, short message service (SMS), near field communication (NFC), a device add-in or through a QR code based application. Presently in South Africa, the most widely implemented mobile payment service is the use of QR code payment services and the Add-In device.

From a QR code perspective, in South Africa there are two leading providers of these QR code mobile payment services, these being SnapScan and FlickPay:

SnapScan was the first to introduce such payment functionality within South Africa where Standard Bank has recently acquired the SnapScan with the view that mobile banking QR code payment services shall become their competitive advantage (Standard Bank, 2014). A merchant who makes use of

SnapScan as a mobile payment service is issued with a unique QR code which is printed and displayed on a stand. Users then scan this code in order to process a payment transaction.

FlickPay on the other hand, uses the same concept as SnapScan using a QR code to facilitate a payment from a users mobile device by scanning a barcode. However, FlickPay differs from SnapScan whereby FlickPay is the only mobile payment service that is directly integrated within a retailers point of sale system. In other words, the cashier at a retail outlet receives confirmation of payment instantly on the point of sale system (van der Berg, 2014). For example, when a user makes use of FlickPay, they are required to download the FlickPay mobile application on their smartphone device, open the application at a merchant outlet, select the merchant outlet they are at where the application then generates a QR code. Once this QR code is generated, the QR code is then scanned by the merchant's point of sale machine and the payment is instantly processed debiting the users pre-loaded debit or credit card.

Although SnapScan and FlickPay are the dominant leaders in this space, there are various other service providers entering into the South African market, which also use the QR code mobile payment service method. These include GuestPay and Zapper (Vermeulen, 2014).

From an Add-In device perspective, ABSA and Nedbank are the only service providers of such mobile payment services in South Africa. ABSA's payment device is called the Payment Pebble, where Nedbanks device is referred to as the Pocket POS (point of sale). The ABSA Payment Pebble does not require users to be ABSA clients and can therefore be linked to any South African bank account. However, the Nedbank Pocket POS can only be linked to a Nedbank account. A new entrant to the Add-In device arena is iKhokha a South African based organisation. iKhokha, has also launched an Add-In device, which can also be linked to any South African bank account.

With the above in mind, mobile payment services identifies the opportunities for financial institutions to extend banking services to new and existing customers (S. Lee, Lee, & Kim, 2007).

2.3 Adoption

Adoption is the result of the conversion rate by the consumer to using mobile payment services. This conversion rate is study of the theoretical model and the link between the attitude towards acceptance, behavioural control and the subjective norms being, the three core constructs of the proposed theoretical model below (Ajzen, 2002; Taylor & Todd, 1995).

2.3.1 Adoption Model Frameworks

Over many years, various intention-based models have been developed and tested to determine the outcomes of behaviour in and around IT space usage. These models have used behavioural intention to predict consumer usage, which in-turn, determined intention factors such as attitude, social influence and facilitating conditions (Taylor & Todd, 1995).

These consumer behaviour studies, which are predominantly used to investigate customer acceptance in the internet banking environment, have focused on attitudes, behaviours and subjective norms which lead and drive consumer behaviour (Brown et al., 2003; Jaruwachirathanakul & Fink, 2005; Pikkarainen et al., 2004; Shih & Fang, 2004; Tan & Teo, 2000). With the above in mind, there is sufficient evidence in the internet adoption arena but very little in the area of mobile payment services. As such, this study focuses on the attitudes, behaviours and subjective norms influencing consumer behaviour towards adopting mobile payment services in the South African market.

These seminal models include; Davis (1989) Technology Acceptance Model (TAM) (Davis, 1986; Pikkarainen et al., 2004), Theory of Reasoned Action

(TRA) developed by both Fishbein and Ajzen (1975) and lastly Theory of Planned Behaviour (TPB) also known as the pure traditional Theory of Planned Behavior model (Ajzen, 1991), which was an extension of the TRA model as well as the Taylor and Todd (1995) decomposed TPB model.

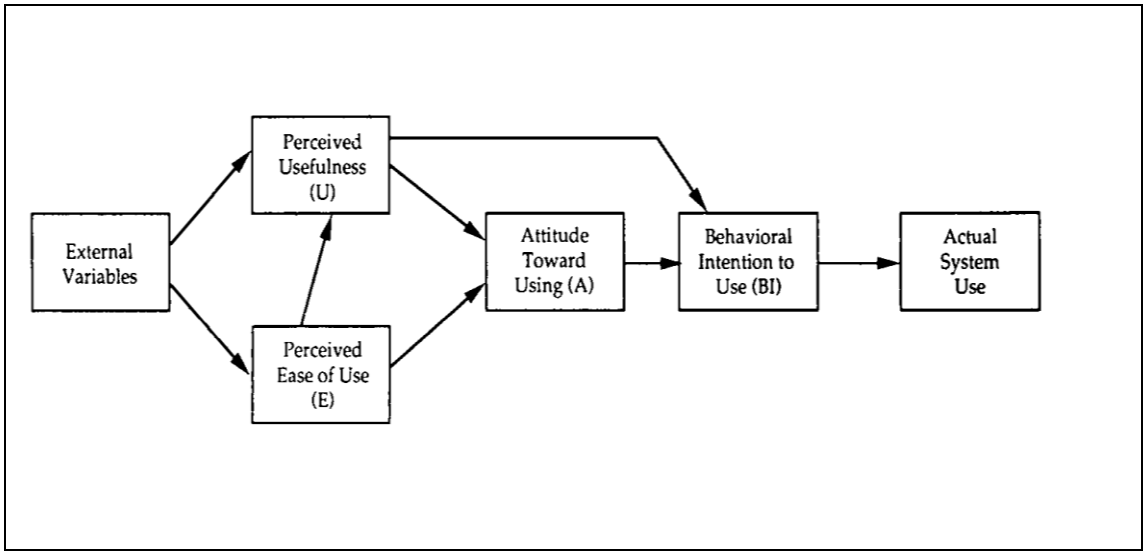
2.3.1.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) originally developed by Fred Davis (Davis, 1986, 1989), which was based on Fishbein and Ajzen (1975)'s Theory of Reasoned Action model (TRA), is a model which assumes that ones social behaviour is driven by ones behavioral attitude. In other words, one's attitude and intention to use a specific technology platform (Davis., Bagozzi, & Warshaw, 1989). The TAM model is well known for its ability to predict user acceptance and use of new information technology within an organisation (Davis, 1986, 1989; Davis. et al., 1989). The TAM model is typically used to predict usage and adoption rates of new technology within information systems (IS) research (Marti-Parreño, Sanz-Blas, Ruiz-Mafe, & Aldás-Manzano, 2013).

Taking this into consideration and evidenced through prior research (Taylor & Todd, 1995), the TAM model has emerged as a powerful method to portray the framework of system usage through beliefs based on two factors;

1. the perceived ease of use, and
2. the perceived usefulness of information systems

According to Taylor and Todd (1995), this model is the more preferable model when wanting to solely determine the prediction of usage. The original TAM model is represented below:



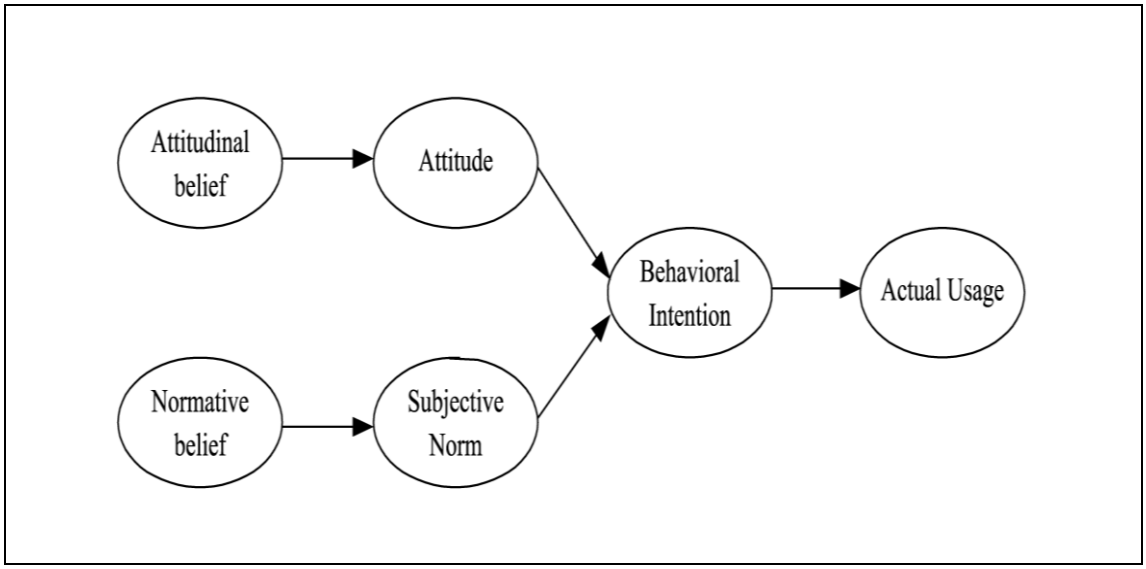
Source: Davis (1986)

Figure 2.6: Technology Acceptance Model (TAM)

2.3.1.2 Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was developed by Fishbein and Ajzen (1975). This model focused on four areas of behaviour; behavioural attitude, subjective belief norms, intention to use and actual use. The subjective belief norms were the differentiators between the TRA and TAM. The normative belief referred to individuals perceptions of the use of internet banking by others (Shih & Fang, 2004).

In addition, Pikkarainen et al. (2004) state that the Theory of Reasoned Action is a theory that assumes the consumer behaviour is rational and consumers gather and analyze information systematically. It was also determined that based on this rational decision making, consumers would evaluate the risk of that action and decide on their next steps (McNeil, 2012). The original TRA model is represented below:



Source: Fishbein and Ajzen (1975)

Figure 2.7: Theory of Reasoned Action (TRA)

2.3.1.3 Theory of Planned Behaviour (TPB)

The original version of the Theory of Planned Behaviour model developed by Icek Ajzen (1985), was an extension of TRA which accounted for conditions where individuals did not have complete control over their behaviour which was broken down further into one's intended behaviour and one's perceived behaviour. The TPB model focuses on behavioural intention being a function of attitude and subjective norm (Fishbein & Ajzen, 1975; Taylor & Todd, 1995).

In addition to the pure Theory of Planned Behaviour, the decomposed Theory of Planned Behaviour model was introduced. The decomposed TPB model is based on the original pure TPB model by Ajzen (1991). The decomposed TPB model uses constructs from Rogers (1983)'s theories of innovation which include relative advantage, complexity and compatibility. In addition to the innovation literature constructs, the decomposed TPB model includes subjective norms and perceived behavioral control.

Shih and Fang (2004) compared the TRA model to both the pure traditional TPB and the decomposed TPB. The research showed that the decomposed TPB model had a significant positive outcome for demonstrating behavioral intention, attitude and subjective norms than the TRA and the pure TPB models.

The decomposed TPB model is successful in predicting and explaining human behaviour across various platforms and breaking outcomes down into specific dimensions. Research indicates that the decomposed TPB model constructs provide leaders and marketing managers with an in-depth tool for understanding usage behaviour, intention and adoption towards system implementation (Jaruwachirathanakul & Fink, 2005). Wang, Lin, and Luarn (2006) also make reference to the decomposed TPB model, which is an integrative model of the TAM, pure TPB and decomposed TPB models, stating that the decomposed TPB model is significantly better than the TAM model (Chau & Hu, 2002; Chau & Hu, 2001). Having said this, the decomposed TPB model delivers a holistic analysis of usage behaviour and intention, and is a more suitable guide than TAM to those searching for answers in the field of system implementation (Taylor & Todd, 1995).

Jaruwachirathanakul and Fink (2005) showed in a comparison between the Technology Acceptance Model (TAM) applied in Finland, versus three tested models in Taiwan (the pure and decomposed forms of Theory of Planned Behaviour (TPB) as well as the Theory of Reasoned Action (TRA) that both the TPB and TRA models were a good fit to the tested data of their study.

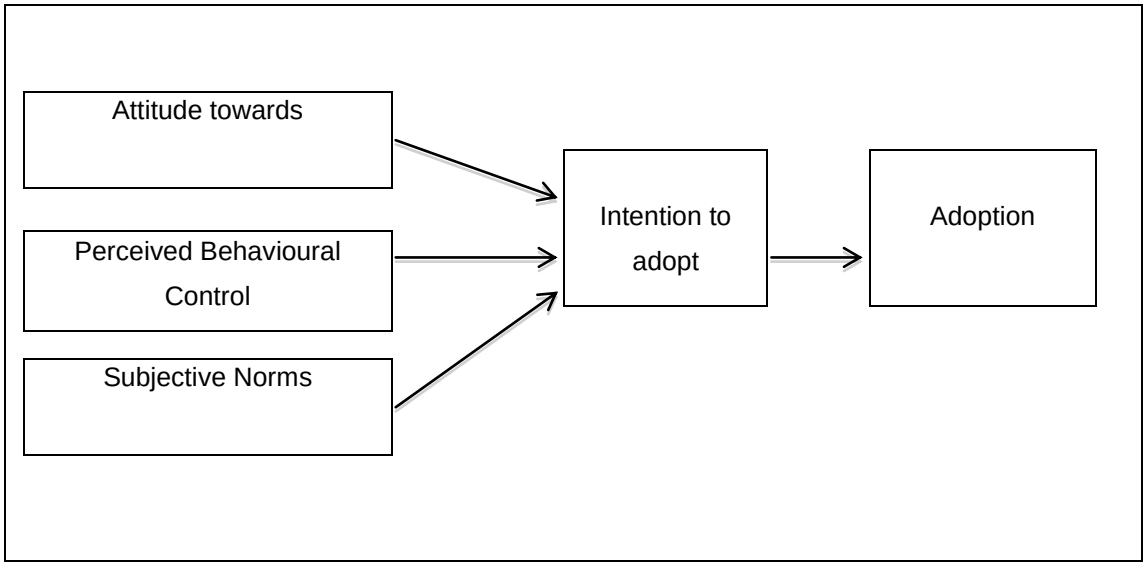
Based on the understanding of the TAM, TRA, and both TPB models, this research assignment will apply the decomposed TPB model. The decomposed TPB model is an effective and appropriate model for investigating the adoption of mobile payment services in South Africa. The decomposed TPB model is most suitable for steering decision makers towards the implementation of innovations. The decomposed TPB model will provide insight into understanding consumers' individual attitudes, subjective norms and perceived behavioural control, which ultimately influences the

likelihood of consumers using mobile payment services (Taylor & Todd, 1995).

According to Püschel et al. (2010) the decomposed TPB, as at 2010, was the most recent of innovation models developed, however, these have been primarily used in different fields of research. This study will use a modified version of the decomposed TPB model in order to fully meet the relevant and necessary objectives of this study. A modified TPB model was used, as the original model included an additional construct, this being a measure on actual usage / adoption. Previous studies (Jaruwachirathanakul & Fink, 2005; Khalifa & Cheng, 2002; Shih & Fang, 2004; Shon & Ok, 2010; Tan & Teo, 2000) have also made use of modified versions of the decomposed TPB model.

In this research study, the justification for using a modified decomposed TPB model is based on establishing only the intent of the South African consumer to adopt mobile payment services and not to test the adoption thereof. In addition, Pedersen and Ling (2003) specifically emphasize that traditional adoption models that are studied within an information systems context, such as the decomposed TPB model, have the ability to be modified when applied to mobile adoption services, such as payment services.

As stated by Taylor and Todd (1995), the decomposed TPB model comprises three core factors (Attitude, Perceived Behavioural Control and Subjective Norms) that have a significant impact on human behaviour. Through this understanding marketers can potentially have clearer direction to their strategic objectives and reaching specific consumer markets. The original pure decomposed TPB model by (Ajzen, 1991) is depicted below:



Source: Taylor and Todd (1995)

Figure 2.8: Pure Decomposed Theory of Planned Behaviour

As has been stated, the decomposed TPB model includes three main factors that influence human behaviour and adoption: Attitude, Perceived Behavioural Control and Subjective Norms.

Firstly, *Attitude* is viewed as one's perception, positive or negative, towards the adoption and usefulness of a specific innovation (Tan & Teo, 2000). Secondly, *Perceived Behavioral Control*, refers to the beliefs about having the available resources and opportunities to adopt a new innovation (Tan & Teo, 2000). Lastly, *Subjective Norms*, refers to the social influences that surround an individual's intention to use a product, service or new innovation (Tan & Teo, 2000).

2.3.1.4 Proposed Theoretical Model

The most well known models of innovation adoption have been researched and analyzed, and the most relevant and appropriate elements of these seminal models have been crafted into a new framework for predicting mobile banking payment services adoption intentions.

As highlight above, this research study, the justification for using a modified decomposed TPB model is based on establishing only the intent of the South African consumer to adopt mobile payment services and not to test the adoption thereof. Therefore this study will use a modified version of the decomposed TPB model in order to fully meet the relevant and necessary objectives of this study.

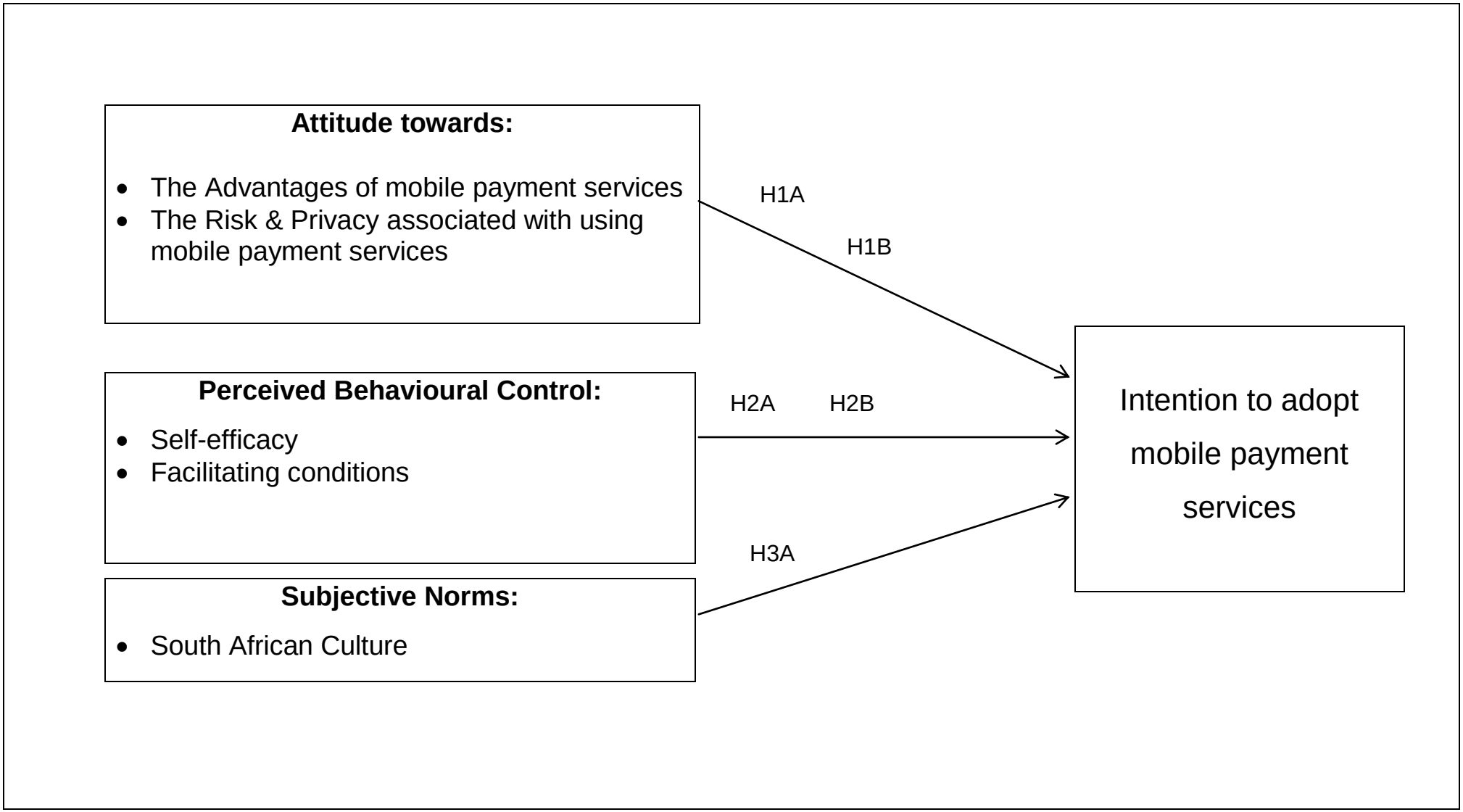


Figure 2.9: Framework for the Adoption of Mobile Payment Services in Johannesburg, South Africa

2.4 Attitude

Attitude, highlighted by Darwin in 1872, is a strong, influential and significant construct within the realms of consumer behaviour (Naresh K Malhotra, 2005; Ndubisi & Sinti, 2006).

An early definition of attitude described by seminal theorists, Fishbein and Ajzen (1975), refers to attitude as one's favourable or unfavorable predisposition towards a behaviour within a given context. That said, attitude is directly related to one's behavioural intention. For example, a person is more likely to have a predetermined behaviour towards something than a positive behaviour towards something (Ndubisi, 2004).

A further definition by Fishbein and Ajzen (1975) towards attitude was that "attitude is a learnt predisposition responding in a consistently favourable or unfavourable manner with respect to a given object". Furthermore, Lutz (1980) clarified that an 'object', when referred to in this context, is something such as a product brand (Proctor and Gamble), retail store (Mr Price), or in some instances an issue, person or behaviour in which consumers have a favourable or unfavorable attitude towards.

Attitude is also referred to as the degree to which one has an open disposition, typically leading to actual open behaviour. In other words, attitude explains a consumer's behavioural intentions. Thus, attitude is an important construct within understanding decision making from a marketing perspective (Lutz, 1980).

Researchers such as Taylor and Todd (1995) make reference to the fact that attitudinal belief within an innovation context, includes five perceived elements: relative advantage, complexity, compatibility, observability and trialabilty (Rogers, 1983).

Consequently, attitude in the case of mobile payment services is referred to as one's perception of the usefulness of mobile payment services. These include the *advantages* and *risks and privacy* which shape attitude towards the adoption of mobile payment services (Taylor & Todd, 1995). It must be noted that Attitude towards is an independent variable.

2.4.1 Hypothesis 1A

Hypothesis 1A: The greater the perceived advantages of using mobile payment services, the more likely mobile payment services will be adopted.

2.4.2 Hypothesis 1B

Hypothesis 1B: The higher the privacy and the lower the perceived risk associated with using mobile payment services the more likely mobile payment services will be adopted.

2.5 Perceived Behavioural Control

In the context of mobile payment services, perceived behavioral control refers to an individual's belief that resources and opportunities exist and will either aid or hinder an individual to utilise mobile payment services. Perceived Behavioural Control is influenced by two components namely; *self-efficacy* and *facilitating conditions* (Taylor & Todd, 1995). Self-efficacy describes an individual's self-esteem towards being able to perform (Bandura, 1977, 1982). Hill, Smith, and Mann (1986) state that self-efficacy is a respectable construct in predicting intentions to use technology products. Therefore, a person that is technologically savvy is further inclined to adopt mobile payment services.

Facilitating conditions is defined as the degree to which resources are easily available in order to perform or partake in the behaviour (Triandis, 1979). Facilitating conditions in terms of mobile payment services can be broken down into specialized resources such as the ease of access, speed of use and associated costs (Taylor & Todd, 1995). It must be noted that Perceived Behavioural Control is an independent variable.

2.5.1 Hypothesis 2A

Hypothesis 2A:The greater the self-efficacy toward using mobile payment services, the more likely mobile payment services will be adopted.

2.5.2 Hypothesis 2B

Hypothesis 2B: The greater facilitating conditions to mobile payment services, the more likely mobile payment services will be adopted.

2.6 Subjective Norms

Mobile payment services in South Africa are relatively new. *Subjective norms* are likely to be influenced by the many cultures within the South African population as well as peer pressure of social groups – this understanding is put to test further in this study. Social groups can include family, friends and individuals within the same social realm (Ajzen, 1985). For example, a recommendation from a family member who has a positive attitude towards a mobile payment services the more likely another family member will use the service. Subjective norm is a powerful construct that aims to measure the social influences on an individual's behaviour (Lutz, 1980). Pedersen (2005) highlights that subjective norm is significant in forecasting customer intention to engage with mobile payments, transactions and commerce. It must be noted that Subjective Norms is an independent variable.

2.6.1 Hypothesis 3A

Hypothesis 3A: Subjective Norms (South African culture) has a significant influence on the adoption of mobile payment services.

2.7 Intention to Adopt

As highlighted above, due to the proposed theoretical model presented below, adoption is the outcome of the theoretical model, therefore adoption in this sense refers to the linkage between attitude towards, perceived behavioural control and subjective norms. The linkages between these three constructs determine the *intention to adopt* (Ajzen, 2002; Taylor & Todd, 1995). It must be noted that Intention to Adopt is the dependent variable.

2.8 Conclusion of Literature Review

After reviewing specific literature surrounding mobile payment services from a consumer behaviour, acceptance and adoption perspective, this chapter shows evidence that mobile payments is a fast-growing entity, where mobile payment services growth is at an early stage of its future life cycle, which on the surface has extremely large growth potential.

In summary, the history, development and adoption of mobile payments has been explored and divulged. In addition, this chapter also explored theoretical and cross-examination understandings of predicating and explaining human behaviour, the drivers of such behaviour as well the various adoption models of technology. Lastly, a gap in literature and research exists specifically on mobile payment services in the South African market which has been identified in this chapter.

The next chapter, chapter 3, will present this studies research methodology.

3 RESEARCH METHODOLOGY

3.1 Research Methodology / Paradigm

The primary methodology chosen for this study is quantitative research methodology. Methodology involving quantitative research, as described by Leedy and Ormrod (2010) examines the characteristics, nuances and variables of research. These are typically not reduced to numerical values. As explained earlier, this study aims to examine the factors that influence consumer behaviour towards adopting mobile payment services in Johannesburg, South Africa, and as such a quantitative research methodology is best suited. Quantitative research is an appropriate method and objective approach to the study of human events. In addition, described by Leedy and Ormrod (2010), quantitative research data is grounded on accurate, specific measurements using both validated as well as structured data-collection instruments.

3.2 Research Design

The primary research method used for this quantitative research was questionnaires. Primary research is defined as personally gathering information to establish results of a particular objective where secondary data is limited or insufficient (Leedy & Ormrod, 2010). The study utilised the following analyses; Cronbach alpha, confirmatory factor analysis, multiple linear regression and t-tests, which encompassed a detailed and systematic examination of the contents derived from the questionnaire data (Leedy & Ormrod, 2010).

Respondents were asked to complete and indicate their answers on a seven-point likert scale. All scales used within this study to measure the framework constructs were based on Taylor and Todd (1995) for attitude, perceived behavioural control (self-efficacy and facilitating conditions), subjective norms and intention to adopt. The study included individuals who are both users and non-users of mobile payment services in Johannesburg, South Africa.

Secondary research was conducted through the analysis of prior research in the field of consumer behaviour, acceptance and adoption strategies for mobile and internet banking as well as mobile payments globally. This process was done through a thorough examination of various databases of library journals, unpublished work, academic textbooks, organisational research, publications and government reports. The majority of the secondary research was collected from academic journals accessed through the University of the Witwatersrand's library portal and library links via Google Scholar. The proposed model has been developed through secondary research.

3.3 Population and Sample

3.3.1 Population

The target population, specifically restricted and limited, for this research study is both men and women within Johannesburg who fell between the ages of 18 and 65 years.

3.3.2 Sample and Sampling Method

In order to address the research problem, the population and sample concerned must be established. From the outset, a population is a large collection of individuals who are included and regarded as the focus of the study. Evidently, a population is naturally too large to approach as it is time consuming and costly. As such, researchers make us of sample techniques (Leedy & Ormrod, 2010).

Sampling is a method used by quantitative researchers which refers to the selection of a specific group or population in which researchers wish to comprise their sample and draw conclusions from (Leedy & Ormrod, 2010). Sampling techniques are classified into either probability or non-probability sampling. Firstly, probability sampling, as defined by Leedy and Ormrod

(2010) and Galpin (2013), is a form of sampling where constituents of the sample are selected from the population, classically known as random sampling. Alternatively, probability sampling is more simply referred to when components within the population have an equal chance of being chosen (Galpin, 2013; Leedy & Ormrod, 2010). This method can subsequently make the assumption that the characteristics within the sample represent the characteristics of those of the entire population. Galpin (2013) also refers to probability sampling when the selection is known.

On the contrary, non-probability sampling is where the researcher has no method of anticipating or guaranteeing that components within the sample truly reflect the characteristics of the population (Galpin, 2013; Leedy & Ormrod, 2010). Again, Galpin (2013) refers to non-probability sampling when the selection is unknown. An advantage of non-probability sampling, identified by Miller, Strang, and Miller (2010), is that this type of sampling does not make use of a sampling frame and is therefore a more cost effective and efficient method of recruiting respondents than that of probability sampling.

In order to make concrete conclusions from the sample, this research assignment conducted a complete random selection process in order to clearly represent the target group population. Due to this study not having or making use of a sampling frame, non-probability sampling in the form of convenience sampling was used. Convenience sampling clearly does not identify specific respondents within a representative subset of its target population (Leedy & Ormrod, 2010). In addition, Miller et al. (2010), as well as Galpin (2013), made a similar conclusion that a convenience sample is where respondents are chosen at random and not specifically identified.

The sample used within this study was obtained from the Johannesburg area as well as those on campus at the University of Witwatersrand. To ensure the sample is representative of the target population, the sample size needs to be large enough and as such, the sample size totaled 215 respondents (Galpin, 2013). All surveys were distributed in person where a conscious effort was made to ensure that respondents included people from different age, race and

gender groups. As previously stipulated, the target population of the study were men and women between the ages of 18 and 65 years who are either users or non-users of mobile payment services and who live, work and study in the Johannesburg area.

Bearing this in mind, one ought to consider the possible occurrence of bias in sampling. Possible sources of bias within this study may include:

A. Because this research assignment makes use of questionnaires, non-reports do occur. An example of a non-report is where respondents are asked to complete questionnaires and decline to do so. This cannot be prevented.

B. Another area of bias emanates from volunteer respondents. Volunteer respondents are minimised to ensure complete random sampling delivers open and honest results.

C. Random students selected from the University of the Witwatersrand have different lifestyles, income levels, access to smart phones, and live in rural and urban areas. Due to these variables, technological abilities differ. With this in mind, questionnaires were developed to include these varied scenarios into the sample to obtain legitimate results.

D. Bias can be influenced by the way a researcher is dressed or presented. It is for this reason that researchers dress appropriately when approaching respondents to reduce the risk of bias.

E. Questionnaires were designed and scrutinized for areas of inlfuence in which a person's education level (including literacy), topic knoweldge and interest as well as other factors that typically distinguish respondents from non-respondents. This minimises bias.

F. It is imperative from an ethical aspect, that results are kept entirely confidential and anonymous so as to prevent or minimise bias in the study.

3.3.3 Participant and Descriptive Statistics

As defined by Leedy and Ormrod (2010), descriptive statistics summarises and describes the collected body of data. Descriptive statistics typically includes points of central tendency, the amount of variability and lastly the degree in which different variables are associated with each other. The descriptive statistics used within this study include age, gender, knowledge and or use of mobile payment services as well as the make of cell phone. They were compared against the respondent's answers as to whether they use or don't use a mobile payment services. Chi-squared tests were derived in order to calculate frequencies, percentages of the demographics as well as determine significance of the Chi-squared tests.

Descriptive statistics are typically described as the systematic organisation and summary of collected data presented in a manner that is helpful and constructive. Generally, descriptive statistics present calculated percentage distributions, measures of variance and central tendency as well as frequency distributions of collected data. This orderly and systematic presentation of structured and distributed data affords the reader a holistic, all-rounded picture (Babbie & Mouton, 2001; Gerber-Nel & Kotze, 2012; Lind, Mason, & Marchal, 1999). From the collected data, descriptive statistic results revealed:

Firstly, table 3.1 below highlights, at a snapshot, the respondent demographic information:

Table 3.1 Gender of Respondents and Frequency of Respondents Who Have Heard About and Use Mobile Payment Services

Demographic	M	SD	Median	Inter-quartile range	Mode (% of sample)
Gender	-	-	Male	-	Male (62%)
Age (Years)	33.75	11.41	32	18 - 65	23 (11%)
Area / Provence				Johannesburg, Gauteng	

3.3.3.1 Gender and Knowledge & Use of mobile payment services

Table 3.2 illustrates the frequencies of the gender of respondents from the questionnaire data. Table 3.2 highlights those who have heard about mobile payment services and those who don't. Likewise, Table 3.2 also highlights those who make use of mobile payment services and those who don't.

Table 3.2 Gender of Respondents and Frequency of Respondents Who Have Heard About and Use Mobile Payment Services

Gender		**Heard About Mobile Payment Services**	
	Frequency	Yes	No
Males	133	130	3
Females	82	71	11
Total	**215**	**201 (93.5%)**	**14 (6.5%)**
		Use Mobile Payment Services	
	Frequency	Yes	No
Males	133	57	76
Females	82	29	53
Total	**215**	**86 (40%)**	**129 (60%)**

Table 3.2 above explains that out of 215 respondents, 201 respondents have heard about mobile payment services, whereas only 14 respondents have not yet heard about mobile payment services. In other words, 93.5% of respondents within this study have heard about mobile payment services.

Further to this, table 3.2 illustrates that although 93.5% of respondents have heard about mobile payment services, only 86 respondents have already adopted and do make use of mobile payment services, whereas 129 respondents have not yet adopted mobile payment services. In other words, 40% of respondents within this study have not yet adopted mobile payment

services. Similarly, those who have already adopted mobile payment services are male (66%).

Although there is no defined hypothesis to investigate if there is a specific difference between males and females and that of non-users and users of mobile payment services, the below t-Test, illustrates this difference and is provided for the interest of the reader:

Table 3.3 Chi-squared Test Testing the Relationship Between Users and Non-Users of Mobile Payment Services for Respondents of Different Genders

Statistic	DF	Value	Prob
Chi-Square	1	1.1861	0.2761
Likelihood Ratio Chi-Square	1	1.1926	0.2746
Continuity Adj. Chi-Square	1	0.8945	0.3443
Mantel-Haenszel Chi-Square	1	1.1806	0.2772

Table 3.3 above illustrates that the Chi-squared P-Value is 0.2761, which is not significant at the 0.05 level of significance. Therefore, we fail to reject the null hypothesis in favour of the alternative hypothesis. Consequently, there is insufficient evidence to conclude that there is indeed a difference among users and non-users of mobile payment services for respondents of different genders.

3.3.3.2 Age and Knowledge & Use of mobile payment services

Age:

Table 3.4 below illustrates the frequencies of the age of respondents from the questionnaire data. In addition, table 3.3 highlights those who have heard about mobile payment services and those who don't. Likewise, Table 3.2 also highlights those who make use of mobile payment services and those who don't.

Table 3.4 Age and Frequency of Respondents Who Have Heard About and Use Mobile Payment Services

Age			Heard About Mobile Payment Services				
	Frequency	Percentages	Yes	Percentages	No	Percentages	Total
18 - 21	16	7.4%	15	94%	1	6%	100
22 -25	55	25.5%	51	93%	4	7%	100
26 -30	30	14%	25	83%	3	17%	100
31-35	28	13%	27	96%	4	4%	100
36 - 40	23	10.7%	22	96%	1	4%	100
41 - 45	28	13%	27	96%	1	4%	100
46 - 50	14	6.5%	14	100%	0	0%	100
51 - 65	21	9.8%	20	95%	1	5%	100
Total	**215**	**100%**	**201**		**14**		**100**

Age			Use Mobile Payment Services				
	Frequency	Percentages	Yes	Percentages	No	Percentages	Total
18 - 21	16	7.4%	8	50%	8	50%	100
22 -25	55	25.5%	23	42%	32	58%	100
26 -30	30	14%	13	43%	17	57%	100
31-35	28	13%	14	50%	14	50%	100
36 - 40	23	10.7%	5	22%	18	88%	100
41 - 45	28	13%	9	32%	19	68%	100
46 - 50	14	6.5%	3	21%	11	79%	100
51 - 65	21	9.8%	11	52%	10	48%	100
Total	**215**	**100%**	**86**		**129**		**100**

Table 3.4 above indicates that 55 (25.5%) respondents were aged between 22 and 25 years. As such, the majority of respondents in this study were young adults aged between 22 and 25 years. Those aged between 26 and 30 years accounted for 14% of respondents, 51 respondents were aged between 31 and 40, while only 6.5% of respondents were aged between 46 and 50 years. This is consistent with Jaruwachirathanakul and Fink (2005) who's study also resulted in the majority of respondents being young adults. This is

supported by Sulaiman et al. (2007) as well as (Mallat, 2007) where their findings indicated that mobile payments and banking is more popular among younger consumers.

From an age perspective, respondents aged 18 to 21 years (50%) as well as those aged between 36 and 40 years (88%) have not yet adopted mobile payment services. An opportunity is presented to potential marketers, bankers, retailers and mobile payment service providers to direct their marketing strategies towards both these age groups.

3.3.3.3 Respondents Make of cell phones used

Table 3.5 Respondents Make of Cell Phone

Make Of Cell Phone		**Use Mobile Payment Services**	
	Frequency	Yes	No
Apple	133	75	58
Blackberry	14	12	2
Samsung	54	33	21
Nokia	5	3	2
HTC	1	0	1
LG	4	2	2
Sony	4	4	0
Total	**215**	**129**	**86**

Table 3.5 above illustrates the different makes of cell phones that respondents use. Amongst the 215 respondents, 133 (62%) respondents use Apple phones, followed by Samsung with 54 (25%) and third highest is Blackberry with 14 (7%). Table 3.5 also illustrates that the amount of respondents within this study, that make use of a mobile payment service. Uses of mobile payment services are predominately on Apple phones, followed by Samsung.

3.4 The Research Instrument

This quantitative research study used questionnaires as the primary research instrument. The designed questionnaire that was used in this study comprised of two sections. It must be noted that the second section of the questionnaire includes two subsections. These two sections are described below:

The first section of the questionnaire provides the reader an introduction to the research, including a description the of the topic of study. In addition, the introductory section provides the respondent an invitation to the study based on voluntary involvement, explaining that confidentially and anonymity will be respected. For the purposes of clarity, a definition of a mobile payment is provided is provided.

The second section, section 2, comprises of three subsections. Section A gleans information about respondents understanding of mobile payment services, demographic factors of respondents such as their lifestyle and whether or not they own a smart phone. The subsection within section 2 – section B – is based on a seven point likert-scale which aim to measure the constructs of the study. Respondents are therefore invited to tick and indicate their responses applicable to them. A total of four constructs are measured, which examine five factors. The framework constructs (four) within section B, based on Taylor and Todd (1995), include attitude, perceived behavioural control (self-efficacy and facilitating conditions), subjective norms and intention to adopt.

The questionnaire used within this study is attached and found in the appendix A section.

All scales used within this study, to measure this studies framework constructs, were based on research done by Taylor and Todd (1995) for attitude, perceived behavioural control (self-efficacy and facilitating conditions), subjective norms and intention.

Similarly in the case of the study done in Thailand by Jaruwachirathanakul and Fink (2005), who also made use of a modified version of the decomposed TPB model, developed by Taylor and Todd (1995), in which the results of the internal reliability of the constructs of the questionnaire concurred with a Cronbach alpha between 0.77 to 0.90. It should be noted that the context of Jaruwachirathanakul and Fink (2005) questionnaire results emanated from internet banking. Their questionnaire scale was based on Taylor and Todd (1995). In addition Tan and Teo (2000) applied the same framework in their study conducted in Singapore. Their Cronbach alpha results ranged from 0.63 to 0.94. As a result, content validity of using such scale in this study is established.

Given that a minimum Cronbach alpha of 0.6 is considered good, this scale is said to be highly appropriate and has adequate reliability in measuring the constructs of this research framework (Galpin, 2013; Jaruwachirathanakul & Fink, 2005). This research study has adapted and modified the Jaruwachirathanakul and Fink (2005) research questionnaire to suit the mobile payment service context. The pilot study tests that the proposed Cronbach alpha scale to determine this study's reliability and validity within a mobile payment service context.

3.5 Procedure for Data Collection

Questionnaires for the research study were distributed to respondents from the Johannesburg area as well as those on campus at the University of Witwatersrand. All surveys were distributed in person where a conscious effort was made to ensure that respondents included people from different age, race and gender groups. It is important to note that due to convenience sampling being used, respondents were not specifically identified and chosen at random who were willing to participate in the research.

As previously stipulated, the target population of the study were men and women between the ages of 18 and 65 years, who are either users or non-

users of mobile payment services and who live, work and study in the Johannesburg area. The cover letter attached to the questionnaire made specific reference in the introduction section who this study questionnaire was targeted at.

3.6 Data Analysis and Interpretation

Once completed, questionnaires were coded – a process of information extraction of “raw data” in order to perform statistical analysis calculations (N.K. Malhotra & Peterson, 2006). In order to perform these statistical analysis calculations this “raw data” needs to undergo a process of coding. As a result, coding involves the allocation of a code which is representative of a respondents given answer to a specific question asked within the questionnaire. The assigned code is generally a numeral symbol or value. Comparably, a very similar definition of coding is provided by Corbin and Strauss (2008), who define questionnaire coding as the numerical value allocation of a respondent. They further state this process of coding is done so with the intent of running statistical analyses so that one may gather information about possible theoretical inferences and related concepts. The rational behind the process of coding is to convert responses into an understandable and readable format for statistical software analysis (Siniscalco & Auriat, 2005).

This process of coding was initially captured, entered and saved on a Microsoft Excel spreadsheet. Once completed it was thereafter imported and examined through Base SAS 9.4, a statistical software programme, for analysis.

The study utilised the following analyses; Cronbach alpha, confirmatory factor analysis, structural equation modeling (SEM) and regression which encompassed a thorough and systematic examination of the information derived from the questionnaire data (Leedy & Ormrod, 2010). It must be

highlighted that the above statistical analyses were performed through SAS using the Proc Corr and Proc Calus statement.

In order to between understand the relationship amongst the variables include in the proposed theoretical mode, the data collected was analysed using correlations.

In this study, the SEM technique was applied as it is considered as “one of the most important quantitative techniques in research today” (G. Lee, 2015). The proposed theoretical model used in this study, is an appropriate and fitting model that can be used for SEM using confirmation factor analysis. The SEM technique assists in testing the primary relationships of the theoretical model and then making a decision on whether accepting and / or reject the theoretical model. To do this, relationships were determined and analysied using Base SAS Proc Calis.

To further explore the relationships exiting in the model, multiple linear regression was applied. Galpin (2013) states that linear regression is a tool used to quantify and determine the actual relationship between two or more variables from the collected data. Linear regression can also be used to predict the value of a variable from another. Linear regression, like SEM, is also said to be one of the most appropriate statistical techniques in examining the relationship between variables in terms of ones hypotheses (Babbie & Mouton, 2001).

With the above in mind, this study measured the extent to which the exogenous factors, that being: *the attitude towards*; *the advantages* of mobile payment services as well as *the Risk and Privacy* of mobile payment services; *the perceived behavioural control* of *self-efficacy* and *facilitating conditions*; and lastly, *subjective norms* that were significantly affecting the *intention to adopt* mobile payment services.

3.7 Validity and Reliability

3.7.1 Validity

Babbie and Mouton (2001) make specific mention and highlight the importance of the validity criteria, as this concept is critical in determining the value and quality of research. As a result, validity of a research scale, as defined by Gerber-Nel and Kotze (2012), is the variance between captured data results of defined constructs and the diagnostic elements that were being measured against. Alternatively, the purpose and aim of validity is to ensure that what is measured is actually measured. Therefore, if a research scale measures what it is supposed to measure, it can be considered perfectly valid and therefore perfectly reliable. Consequently, the reverse of this notion is also upheld in that; a measure that does not measure what it is supposed to measure, is therefore truly unreliable and not valid (Babbie & Mouton, 2001; Galpin, 2013; Gerber-Nel & Kotze, 2012).

Having explored validity, another critical notion important in research is the consideration of content validity. Galpin (2013), defines content validity of a research scale as the extent to which a proposed scale legitimately measures the suggested theoretical construct of interest. Similarly content validity can be defined as the differential represented on a specific scale which illustrates the degree of a construct that is being assessed (Leedy & Ormrod, 2010). Through a systematic and comprehensive review of prior literature, this research paper's questionnaire can be said to have determined content validity

This included, previous research providing content validity of the Taylor and Todd (1995) scale. Scales used within this research were tested for validity as part of the pilot study before distributing questionnaires for the main analysis. As mentioned earlier this study made use of a seven-point likert scale which measured four constructs (Attitude, Perceived Behavioural Control, Subjective Norms and Intention) totaling seven factors. Each factor included five questions. In addition, it was noted earlier, that the questionnaire that is being

used in this study derived from previous research done by Jaruwachirathanakul and Fink (2005). The validity of the questionnaire used for this research has been modified and tested to be valid for the purpose of mobile payment services adoption in South Africa. A confirmatory factor analysis was performed in this study in order to test and ensure validity of the research scales. Chapter 4 presents the analysis of the factor analysis

3.7.1.1 External validity

External validity determines whether or not a causal relationship can be established from a sample Calder, Phillips, and Tybout (1982). In other words, external validly relates to the validity of a sample selection. To explain this further, a strong sample selection includes a sample that is a representative of the sample size.

3.7.1.2 Internal validity

Internal validity focuses on understanding whether or not differences or relationships occur on the dependent variable due to influence caused by the independent variable alone and not additional variables (Airasian & Gay, 2000). It must be mentioned that in order to test the measurement model the confirmatory factor analysis was used.

3.7.2 Reliability

In order to establish research quality, reliability is regarded as one of the most critical measures in research. To this end, Babbie and Mouton (2001) state that a core objective of reliability is to examine and continually test if a specific technique applied delivers matching results repeatedly. Following this definition, reliability can also be defined as a scale consistently measuring what it set out to measure (Connaway & Powell, 2010).

Acknowledged by both Galpin (2013) and Connaway and Powell (2010), the Chronbach Alpha calculation is the most common and widely used tool in assessing research reliably. It claims this position due to its systematic, highly significant, and thorough measurement of reliability. Given that a variables

reliability is determined through a Cronbach Alpha above the 0.6 margin; any variable that resulted in an Cronbach Alpha above the 0.6 margin in this study was therefore concluded as reliable. As a result, each likert scale question in this study was tested for reliability through the calculation of the Chronbach Alpha coefficient.

3.8 Pilot Study

In establishing a studies feasibility, a pilot study, typically on a fraction of the size of the sample, is undertaken. Leedy and Ormrod (2010) make mention that a core objective of conducting a pilot study is aimed at determining the most applicable and appropriate approaches in answering a studies research problem as well as eliminating unnecessary and inappropriate techniques. Zikmund and Babin (2010) highlight to researchers the benefits of making use of a pilot study. They emphasis that by doing a pilot study this contributes significantly towards mitigating any difficulties respondents may have; whether in understanding, bias or ambiguous elements.

This study made use of the pilot study technique in which a pilot questionnaire was distributed in the Johannesburg area. This questionnaire, from the outset stipulated the core research study objective and purpose to the reader. As a result, the pilot questionnaire made use of a convenience pilot study sample size of ten respondents. This was done through a random process of inviting respondents to participate. Based on all ten respondents feedback, which was positive, affirming understandability of the questions as well as respect to time limits, no additional modifications or alterations were performed on the pilot questionnaire. By conducting such a pilot study, this equipped and aided in making necessary changes and improvements to the questionnaire, so that potential respondents can have a greater understanding of consumer behaviour, acceptance and adoption strategies for mobile payment services in Johannesburg.

3.9 Testing Factor Structure of Variables

3.9.1 Confirmatory Factor Analysis

Factor analysis differs from other statistical techniques, such as variance or regression, whereby variables are not classified as independent or dependent but rather are examined as a set of interdependent relationships amongst a number of variables (N. Malhotra & Birks, 2003). In addition, Galpin (2013) also defines factor analysis as a means of summarizing the data into fewer dimensions, however it is emphasised that factor analysis has a formal model underling the analysis in terms of which variables are observed and are related to the unobservable constructs or factors.

This study made use of Confirmatory Factor Analysis (CFA) which was used "to examine the fit of latent variables underlying manifest variables" (G. Lee, 2015). The factor analysis procedure run in this research study made use of the promax rotation method which was run through Base SAS 9.4. As a result, in order to test the data's factor structure a confirmatory factor analysis was performed using the structural equation modeling technique. This was performed through the Proc Calis statement in SAS.

From the outset, it is imperative to test for reliability and validity of the data. As a result, correlations and Chronbach's Alphas were determined and are presented in table 4.1 in chapter 4 on page 60. Do note that Cronbach's Alpha's for the main variables are given in parenthesis on the diagonal of the correlations.

All calculated Chronbach Alhpha's were above the 0.7 margin with the expectation of *Subjective Norms* which resulted in a Chrobach's Alpha of 0.53. As a result, the Subjective Norms construct is below the 0.6 margin and the measurement of this variable can therefore be concluded as unreliable. An executive summary of all the Cronbach's Alpha's calculations is provided in Table 3.6 on page 53.

Due to these variables being deemed reliable, the confirmatory factor structure was performed using the structural equation modeling technique. In terms of clarity, the factor structure factors were *attitude*, *perceived behavioural control*, *subjective norms* and *intention to adopt*. These four factors were adopted and adapted from a modified version of the decomposed TPB model with the objective of establishing only the intent of the South African consumer to adopt mobile payment services.

In order to perform the structural equation modeling technique, there are a series of model assumptions and fit assessments in order to ensure model normality as well as fit. As a result, assumptions and fits were determined during the confirmatory factor analysis and these are presented on the next page in table 3.7 and 3.8 respectively.

Table 3.6 Executive Summary of Cronbach Alpha Calculations for the Full- & Pilot- Study

Cronbach Alpha		
	Full Study	**Pilot Study**
ATTITUDE		
Total Attitude	**0.72**	**0.81**
Attitude of the **ADVANTAGES** of MPS	0.70	0.80
Attitude of the **RISK & PRIVACY** of MPS	0.74	0.81
PERCEIVED BEHAVIOURAL CONTROL		
Total Perceived Behavioural Control	**0.79**	**0.63**
Self-Efficacy	0.85	0.85
Facilitating Conditions	0.73	0.40
SUBJECTIVE NORMS		
South African Culture	**0.53**	**0.69**
INTENTION TO ADOPT		
Intention to Adopt MPS's	**0.72**	**0.88**

Table 3.7 Structural Equation Model Assumptions

	Diagnostic	Indication
1	The normalized Mardia estimate	Multivariate normality
2	Acceptably low variance inflation factors (VIFs), condition indices and proportion of variation eigenvectors	Low multicollinearity
3	Residual plots	Minimal heteroscedasticity
4	Linearity of equations	Predictor variables are homogenous and additive
5	Check for outliers and delete	To prevent skewed data and poor normality

(Barnes, 2012; G. Lee, 2015)

Table 3.8 Structural Equation Global Model Fit Statistics

Global Fit Statistic	Abbreviation	Indicates	Conventional, although not determinative Cut-off's	
			Good Fit Cut-off	OK Fit Cut-off
Chi-Square Statistic	X^2	Goodness-of-fit	Non-significant chi-square (p>.05)	Significant chi-square if sample size reasonably large
Standardized Root Mean Square Residual	SRMSR	Absolute model fit	<.05	<.08
Root Mean Square Error Approximation	RMSEA	Model parsimony	<.05 especially if upper end of CI <0.8	<.08 especially if upper end of CI <0.10
RMSEA Confidence Intervals	90% CI	Accuracy of RMSEA	>.95	>.90
Bentler Comparative Fit Index	CFI	Goodness-of-fit	>.95	>.90

Distribution of residuals	-	Distribution of residuals	Normal distribution	Roughly normal
Bentler-Bonnet Non-Normed Fit Index	NNFI	Individual fit	Normal distribution	Roughly normal
Akaike's Information Criterion	AIC	Model parsimony	The lower the better	
Bozdogan Consistent Akaike's Information Criterion	CAIC	Model parsimony	The lower the better	
Schwarz Bayesian Criterion	SBC	Model parsimony & good fit	The lower the better	

(Barnes, 2012; G. Lee, 2015)

Based on the above model assumptions and fit assessments, the CFA results concluded that the model had acceptable fit however it had some poor fit indices as well as some non-normal variables. As a result and in order to provide an acceptable fit to the data, power transformations to the variables were applied in order to achieve normality. It must be noted that four variables within the data had poor fits to the confirmatory structure and were removed however; all other variables had good fits.

In summary, the final measurement model displayed acceptable fit, including the following indices: *Chi-Squared (234) =383.1 p =.0001, SRMSR =.06, RMSEA =.05 (90% CI = .05 – .08), CFI =.91, NNFI =.90*

Below is a more thorough explanation of the above reported summary:

The Chi-Squared p-value is 0.0001 < 0.05, therefore is significant and suggests that there are significant differences between the actual and the predicated covariance's. It must be noted that due to the sample size being 215 (significantly large) this might have had an affect on this. If the sample

size was smaller it may have resulted in being non-significant. That said however, it can be concluded that there is an OK model fit to the data.

Standardized Root Mean Square Residual (SRSMR) is 0.0616, it can therefore be concluded that the data has an OK fit to the data. However, due to the SRSMR being significantly close to 0.05 it can be assumed that the model is a good fit to the data. In other words, the model almost perfectly predicts the actual data.

Lastly, Root Mean Square Error Approximation (RMSEA) is 0.0547. Due to the RMSEA being between the <0.5 and <.08 confidence interval (rounding down) it can therefore be concluded that the data has a good fit to the model.

In summary of the above statistic model fit determinates, it can therefore be concluded that the model is a good fit to the data.

To further to determine model to data good fit, the following incremental indices were also compared and analysed:

CFI (Bentler's Comparative Fit Index) is 0.9131 > 0.90 therefore it can be concluded that the model is an OK and acceptable fit to the data. Similarly, NNFI (Non-normed fit index) results equaled 0.8975, rounded to 0.9. Therefore 0.9 > 0.95 therefore it can be concluded that the model is an OK and acceptable fit to the data (G. Lee, 2015).

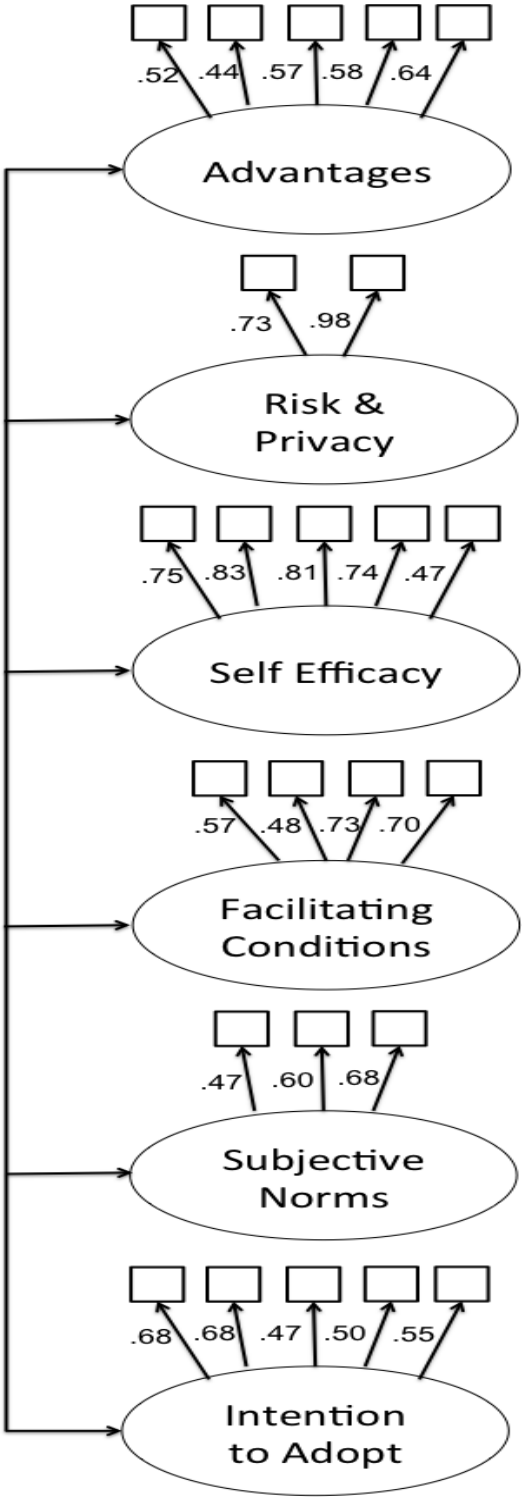
In summary and conclusion, the factor structure derived from the CFA fulfills the SEM model assumptions and fit checks with an acceptable model fit and the CFA structure is accepted.

Table 3.9 Summary Table of the Global Fit Statistics Results for the Intention to Adopt Model

	Statistic	Intention to Adopt Model
1	χ^2	383.10*** (234)
2	**SRMSR**	0.0616
3	**RMSEA**	0.0547
4	**AIC**	515.1025
5	**CAIC**	803.2569
6	**SBC**	737.2569
7	**CFI**	0.9131
8	**NNFI**	0.8975

It must be highlighted that after the initial factor analysis was run, it was evident that some items had poor fit and were subsequently removed. As a result, the final model has the following fit, which is acceptable. This factor structure of major parameters is illustrated below in figure 3.10.

Figure 3.1 CFA Major Parameters



Standardized Results for Covariances Among Exogenous Variables

Var1	Var2	Estimate
Risk_Privacy	Advantages	.41
Self_Efficacy	Advantages	.64
Self_Efficacy	Risk_Privacy	.27
Facilitating	Advantages	.36
Facilitating	Risk_Privacy	.52
Facilitating	Self_Efficacy	.15
Subjective	Advantages	.88
Subjective	Risk_Privacy	.33
Subjective	Self_Efficacy	.58
Subjective	Facilitating	.24
Intentions	Advantages	.82
Intentions	Risk_Privacy	.39
Intentions	Self_Efficacy	.72
Intentions	Facilitating	.30
Intentions	Subjective	.83

3.9.2 Structural Model

Due to the CFA accepting the factor structure, the factor structure can be analysed and tested through the SEM technique using the Proc Calis statement.

As mentioned earlier, this research assignment will use a modified version of the decomposed TPB model which is an effective and appropriate model for investigating the adoption of mobile payment services in South Africa. Therefore the SEM model comprises of three exogenous factors [“factors that are within the middle but only as a cause of other variables”] (G. Lee, 2015), that being, *attitude towards, perceived behavioral control and subjective norms*. These three exogenous factors have a direct effect on the endogenous factor [“a variable in the model but only as a cause of other variables”] (G. Lee, 2015), that being *the intention to adopt* factor.

4 PRESENTATION OF RESULTS

4.1 Introduction

From the outset, this study focused on examining the factors towards adopting mobile payment services within the South African market. As a result, the core focus of this chapter is to describe and present collected and calculated results from the analyzed data. The results in this chapter pertain to hypotheses one, two, three and four. All hypotheses were analysed for reliability through calculating the Cronbach alpha. Thereafter, relationships amongst constructs were determined through confirmatory factor analysis and structural equation modeling.

4.2 Descriptive Statistics & Correlations

Descriptive statistics used within this study included age, gender, knowledge and or use of mobile payment services as well as the make of cell phone. These descriptive statistic results have been reported in chapter 3. However, descriptive statistics of the main variables and their correlations are presented in Table 4.1 on the next page. It must be noted, that although all relationships are presented in table 4, only main constructs and their variables will be discussed:

As can be seen from Table 4.1, from an *attitude* construct perspective, a positive relationships and high correlations exist between the attitude towards the *advantages* of mobile payment services *(r =.55, p<.0001)* and the attitude towards the *risk and privacy* of mobile payment services *(r =.45, p<.0001)*. Similarly, positive relationships with moderate correlations exist between the attitude towards the *advantages* of mobile payment services and the attitude towards the *risk and privacy* of mobile payment services *(r =.38, p<.0001).*

In terms of the perceived behavioural control construct, positive relationships and high correlations exist between the intention to adopt mobile payment services and both *self-efficacy (r =.56, p<.0001)* and *facilitating conditions (r =.37, p<.0001) [lower, moderate correlation]* of mobile payment services. Similarly, positive relationships with weak to moderate correlations exist between *self-efficacy* and the *facilitating conditions (r =.23, p<.0001)*.

Subjective norms also demonstrates positive relationships with high correlations between the *intention to adopt* mobile payment services and the subjective norms variable *(r =.52, p<.0001)*.

The next section will further analysis the relationships between these main constructs.

Table 4.1 Descriptive Statistics and Correlations

	N	Mean	Std Dev	1	2	3	4	5	6	7	8	9	10
1 Age	215	33.75	11.41	1.00									
2 Gender	215	0.38	0.49	.02	1.00								
3 Heard About MPS	215	0.07	0.25	-.11	-.22***	1.00							
4 Used MPS	215	0.60	0.49	.05	.07	-.22***	1.00						
5 Advantages Of MPS	215	6.27	0.52	-.18***	.01	-.10	-.19***	(.70)					
6 Risk & Privacy of MPS	215	6.54	0.47	-.02	-.01	-.89***	-.19***	.38***	(.74)				
7 Self Efficacy	215	6.24	0.54	-.11	-.12*	-.13*	-.25***	.52***	.33***	(.85)			
8 Facilitating Conditions	215	6.39	0.45	-.03	-.06	-.18***	-.04	.34***	.40***	.23***	(.73)		
9 Subjective Norms	215	5.78	0.69	-.17*	0	-0.04	-.13*	.48***	.36***	.33***	.28***	(.53)	
10 Intention to Adopt	215	6.34	0.49	-.08	.06	-.15**	-.28***	.55***	.45***	.56***	.37***	.52***	(.72)

Notes: *** =p<0.01, **=p<0.05, *=p<0.1 *Cronbach alphas indicated in parentheses*

4.3 Structural Equation and Moderation Model

As mentioned in section 3.10.2, Structural Model, the factor structure was analysed and tested through the SEM technique using the Proc Calis statement. This section will discuss and include the model fit evaluation table, a diagrammatic view of the SEM and standardized path co-efficient, as well as a decomposition effects table.

4.3.1 Proposed Theoretical Intention to Adopt Model

The proposed theoretical intention to adopt model, that being a modified version of the decomposed theory of planned behaviour model, discussed in chapter two (pages 22 – 29) and presented in figure 2.9 on page 30.

Construct's *attitude towards, perceived behavioural control* and *subjective norms* (independent variables) are modeled to have direct effects on the *intention to adopt mobile payment services* (dependent variable). In performing the model fitting, the SAS modification indices recommended that the *attitude* construct (which includes advantages towards and risk & privacy of MPS) should be modeled to have a more direct effect on *the intention to adopt*. As a result, this modification to the model was made and will be discussed as recommendation towards an alternative proposed theoretical model when identifying and assessing the consumer behaviour factors that impact upon the adoption of mobile payment services in the South African market. This recommendation will be discussed in section 4.3.2.

As mentioned earlier in chapter three, research methodology, section 3.10.1 in table 3.8 the standard SEM model fit checks are provided. A final model fit statistics results table is illustrated in table 4.3 on the next page which includes the modification of the attitude construct – named below as *"New Recommended Model (Attitude in the middle) [Model 2]"*.

Table 4.2 Model Fit Comparisons

	Statistic	Intention to Adopt Model	New Recommended Model (Attitude in the middle)
1	χ^2	383.10*** (234)	383.46*** (235)
2	**SRMSR**	0.0616	0.0616
3	**RMSEA**	0.0547	0.0545
4	**AIC**	515.1025	513.4592
5	**CAIC**	803.2569	797.2476
6	**SBC**	737.2569	732.2476
7	**CFI**	0.9131	0.9135
8	**NNFI**	0.8975	0.8984

*Notes: p <.01***, Degrees of freedom are given in parentheses*

As one can see above, although the SAS modification indices recommended that the *attitude* construct should be modeled to have a more direct effect on *the intention to adopt*, this model demonstrates almost identical model fit results with very slight variations.

Table 4.2 above illustrates that the global fit of the *intention to adopt model (model 1)* is acceptable where the final measurement model displayed acceptable fit, including the following indices: *Chi-Squared (234) =383.1 p =.0001, SRMSR =.06, RMSEA =.05 (90% CI = .05 – .08), CFI =.91, NNFI =.90*

Likewise the *'new recommended model with attitude in the middle' (Model 2)* also illustrates is also acceptable where the final measurement model displayed near to good fit, including the following indices: *Chi-Squared (235) =383.5 p =.0001, SRMSR =.06, RMSEA =.05 (90% CI = .05 – .08), CFI =.91, NNFI =.90*

The *intention to adopt model* (model 1) is illustrated in figure 4.1 below which highlights the standardized path co-efficients, that being the size of the exogenous factor direct effects on the endogenous factors, as well as the R-Squared values for the endogenous factor *(intention to adopt).*

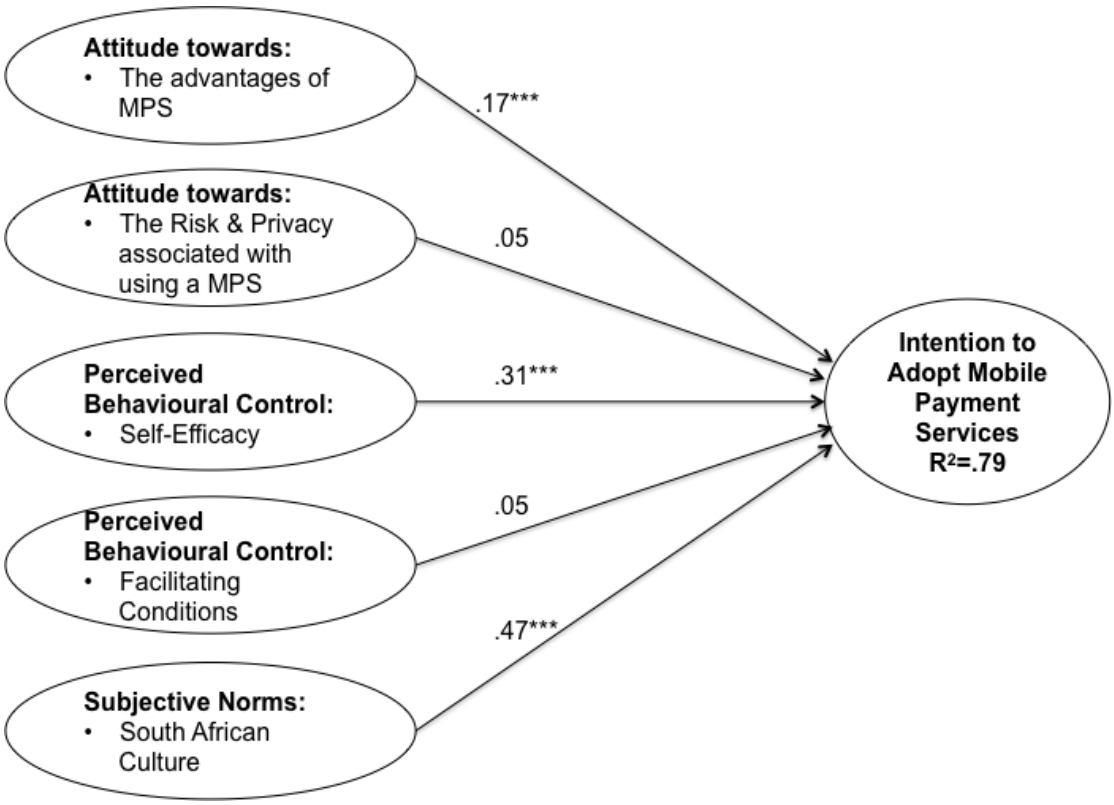


Figure 4.1 Intention to Adopt Model SEM and Standardized Path Co-efficients (Model 1)

Having determined the fit of the structural equation modeling output above, (which incorporates the above beta results) the end report of the SEM analysis is a total decomposition of all the effects of the casual variables on the *intention to adopt* variable. Therefore, the standardized effects results in the form of a decomposition table for the path analysis, on the proposed theoretical intention to adopt model, is presented in figure 4.2 on the next page:

Causal Variables		Intention to Adopt MPS β	SE_B
Attitude towards the Advantages of MPS			
	Direct effect	.17***	.37
	Indirect effect	-	-
	Total effect	.17***	.37
Attitude towards the Risk & Privacy associated with using MPS			
	Direct effect	.05	.08
	Indirect effect	-	-
	Total effect	.05	.08
Perceived Behavioural Control: Self-Efficacy			
	Direct effect	.31***	.10
	Indirect effect	-	-
	Total effect	.31***	.10
Perceived Behavioural Control: Facilitating Conditions			
	Direct effect	.05	.10
	Indirect effect	-	-
	Total effect	.05	.10
Subjective Norms			
	Direct effect	.47***	.33
	Indirect effect	-	-
	Total effect	.47***	.33
R-Squared		**.79**	

*Notes: ***=p <.01, N=215*

Figure 4.2 Decomposition Effects Table for the Intention to Adopt Model

Figure 4.2 above shows the standardized direct, indirect and total effects for the intention to adopt model. As per figure 4.2 only direct effects are reflected, on the *intention to adopt* mobile payment services. Attitude towards the *advantages* (β = .17, p <.01) has a moderate direct effect on the intention to adopt, while attitude towards the *risk & privacy* (β = .05) has a weak direct effect on the intention to adopt. Perceived behavioural control for *self-efficacy* (β = .31, p <.01) has a moderate direct effect on the intention to adopt, whereas perceived behavioural control for *facilitating conditions* (β = .05) has a weak direct effect on the intention to adopt. Lastly *subjective norms* (β = .47, p <.01) has a moderate direct effect on the intention to adopt.

Based on the above results, figure 4.1 above confirms the direct effect paths for the proposed theoretical model. These direct effects are all significant at the 1% level with the exception of *risk & privacy* and *facilitating conditions*. The R-Squared results for *intention to adopt* =.79 which may indicate that a large percentage of the variance of intention to adopt is explained by the model. In addition, R-Squared also indicates a very good fit to the data. This finding is further explored in chapter 5, the discussion section.

4.3.2 Alternative Model Produced by SEM (Model 2)

As mentioned above, the SAS modification indices recommended that the *attitude* construct should be modeled to have a more direct effect on *the intention to adopt*. The below model, figure 4.3, demonstrates this alternative model relationship with the attitude construct in the middle.

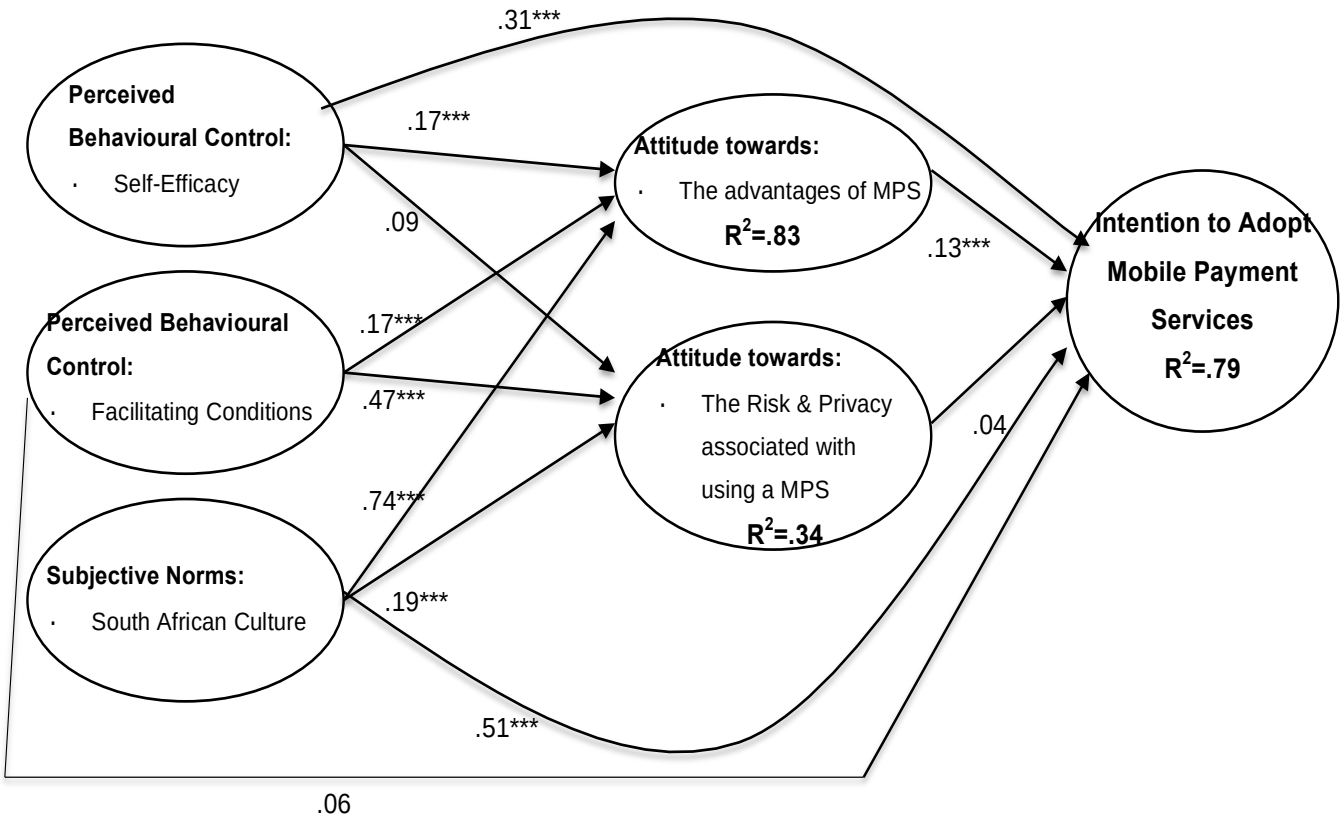


Figure 4.3 Alternative SEM Model with Attitude in the Middle and Standardized Path Co-efficients (Model 2)

Having determined the fit of the structural equation modeling output above, (which incorporates the above beta results) the end report of the SEM analysis is a total decomposition of all the effects of the casual variables on the intention to adopt variable. Therefore, the standardized effects results in the form of a decomposition table for the path analysis, on the *alternative SEM model* with the attitude construct in the middle, is presented in figure 4.4 on the next page:

		Attidude				Intention to Adopt MPS	
		Advantages of MPS		Risk & Privacy			
Causal Variables		β	SE_B	β	SE_B	β	SE_B
Attitude towards the Advantages of MPS							
	Direct effect	-	-	-	-	.13***	.40
	Indirect effect	-	-	-	-	-	-
	Total effect	-	-	-	-	.13***	.40
Attitude towards the Risk & Privacy associated with using MPS							
	Direct effect	-	-	-	-	.04	.08
	Indirect effect	-	-	-	-	-	-
	Total effect	-	-	-	-	.04	.08
Perceived Behavioural Control: Self-Efficacy							
	Direct effect	.17***	.12	.09	.09	.31***	.40
	Indirect effect	-	-	-	-	.03	.08
	Total effect	.17***	.12	.09	.09	.34***	.11
Perceived Behavioural Control: Facilitating Conditions							
	Direct effect	.17***	.09	.47***	.07	.06	.11
	Indirect effect	-	-	-	-	.04	.09
	Total effect	.17***	.09	.47***	.07	.11***	.08
Subjective Norms							
	Direct effect	.75***	.12	.19***	.10	.51***	.37
	Indirect effect	-	-	-	-	.10***	.30
	Total effect	.75***	.12	.19***	.10	.61***	.12
R-Squared		**.83**		**.34**		**.79**	

*Notes: ***=p <.01, N=215*

Figure 4.4 Decomposition Effects Table for the Alternative SEM Model with Attitude in the Middle (Model 2)

Figure 4.4 above shows the standardized direct, indirect and total effects for the alternative SEM model.

As figure 4.4 illustrates, the factors of *perceived behavioural control* and *subjective norms* have very interesting direct effects on the factors for the attitude constructs (*advantages* and *risk & privacy*).

In terms of the first attitude variable, *advantages*, the factors of *perceived behavioural control; self-efficacy* (β =.17, p <.01) and *facilitating conditions*

(β=.17, p <.01) have a moderate direct effects on advantages. Whereas *subjective norms* (β =.75, p <.01) has a very strong direct effect on advantages. The R-Squared results for *advantages* =.83 which is very high indicating a very good fit to the data.

In terms of the second attitude variable, *risk & privacy*, the factors of *perceived behavioural control; self-efficacy* (β =.09) and *facilitating conditions* (β=.47, p <.01) have weak and moderate direct effects on *risk & privacy* respectively. Whereas *subjective norms* (β =.19, p <.01) has a moderate direct effect on *risk & privacy*. The R-Squared results for *risk & privacy* =.34 which explains a weak to moderate percentage of the variance and indicates a moderate fit to the data.

The paths from the *attitude* constructs that have an effect on *intention to adopt* are now discussed. The advantages (β=.13, p <.01) and the *risk & privacy* (β=.04) have moderate and weak direct effects respectively on the *intention to adopt*. The R-Squared results for *intention to adopt* =.79 which may indicate that a large percentage of the variance of intention to adopt is explained by the model. In addition, R-Squared also indicates a very good fit to the data.

Interestingly, *self-efficacy* and *subjective norms* are the only two variables that have direct effects on the *intention to adopt*. *Self-efficacy* (β=.31, p <.01) demonstrates a moderate direct effect, whereas *subjective norms* (β=.51, p <.01) demonstrates a moderate to strong direct effect on the *intention to adopt*.

These findings are further explored in chapter 5, the discussion section.

4.3.3 Comparison of Models

This section will do a comparison of models in terms of the different variable constructs in relation to the original proposed theoretical intention to adopt

model (model 1) as well as the *'*new recommended model with attitude in the middle*' (Model 2)*. In the interest of clarity, this will be done by comparing the *attitude*, *perceived behavioural control* and *subjective norms* constructs respectively.

In terms of the attitude construct, *advantages* (β=.17, p <.01) and *risk & privacy* (β = .05) have a moderate and weak total effect respectively on the *intention to adopt* in model 1. Whereas, in model 2, the effects were slightly lower than that of model 1 where *advantages* (β=.13, p <.01) and *risk & privacy* (β = .04) have a moderate and weak total effect respectively on the *intention to adopt* in model 2. It must be noted that in both model 1 and model 2, *advantages* was the only attitude variable that resulted in being significant at the 1% level.

In terms of the perceived behavioural construct, *self-efficacy* (β = .31, p <.01) and *facilitating conditions* (β = .05) have a moderate and weak total effect respectively on the *intention to adopt* in model 1. It must be noted, that the SEM results revealed that *facilitating conditions* was insignificant at the 1% level. Whereas, in model 2, the total effects were slightly higher than that of model 1 where *self-efficacy* (β=.34, p <.01) and *facilitating conditions* (β= .11, p <.01) have a moderate and weak total effect respectively on the *intention to adopt* in model 2. Both variables in model two for perceived behavioural which were significant at the 1% level.

Lastly, in terms of the subjective norms construct, *subjective norms* (β = .47, p <.01) had a strong total effect on the *intention to adopt* in model 1, which is significant at the 1% level. Whereas, in model 2, the total effect was were slightly higher than that of model 1 where *subjective norms* (β=.51, p <.01) had a stronger total effect on the *intention to adopt* in model 2, which is also significant at the 1% level.

Overall and in summary, model 2 demonstrated stronger direct, indirect and total effects on the intention to adopt than that of model 1.

4.4 Regression Analysis Results

This section will now focus on the regression analysis of all the major predictors on the intention to adopt. To reiterate, there are 5 major variables – *advantages, risk & privacy, self-efficacy, facilitating conditions* and *subjective norms* – in predicting the *intention to adopt* mobile payment services.

Galpin (2013) states that linear regression is tool used to quantify and establish the actual "relationship between two or more variables" from the collected data. Linear regression can also be used to "predict the value of a variable from another" Galpin (2013). Linear regression, like SEM, is said to be one of the most appropriate statistical techniques in examining the relationship between variables in terms of ones hypotheses (Babbie & Mouton, 2001). It must be noted that the chosen level of significance for all linear regressions was at the 0.05 (5%) level.

An important note is that the linear regression was performed through SEM in SAS using Proc Calis. By doing so, regression checks were performed and outliers were found. As a result, a robust regression was performed in order to adjust for some remaining outliers. An additional note to this regression is that the intercept is ignored due to this regression being run in SEM. Lastly; the linear regression shows no major assumption violations.

The overall fit to the final model results are demonstrated in table 4.3 below. However, the final model demonstrates a strong fit with the R^2=.79. The strong R^2 statistic in this study compares favourably with the R^2 statistic in a similar study being .76 by Taylor and Todd (1995).

Table 4.3 on the next page illustrates the regression results for the *intentions to adopt model*. All hypotheses analysed in this study relate to the results indicated in this table.

Table 4.3 Regression Analysis Results

	Effect on Intention to Adopt MPS	
	β	***Standard Error***
Attitude towards		
Advantages	.30***	.53
Risk & Privacy	.06***	.08
Perceived Behavioral Control		
Self-Efficacy	.31***	.10
Facilitating Conditions	.10**	.13
Subjective Norms		
South African Culture	.54***	.38
R^2	0.79	

*Note: N=215, β = unstandardized effect, *** = p < .01, ** = p < .05, * = p < .10*

4.4.1 Regression Results Pertaining to Attitude Construct

As mentioned earlier, the *attitude* construct has two variables – the *advantages towards* and the *risk & privacy* associated with mobile payment services (independent variables) – which load onto the *intention to adopt* (dependent variable). The *attitude* construct therefore consists of both hypotheses 1A and hypothesis 1B.

Table 4.3 on the previous page presents the regression output relationships (beta co-efficients) of the main variables for the *intention to adopt mobile payment services model*. The results pertaining to attitude are discussed below:

In terms of Hypotheses 1A, *advantages* is positively associated with the *intention to adopt* with a moderate effect (β =.30, p <.01) providing support for hypothesis 1A. In other words, when *advantages* increases by 1 unit, *intention to adopt* increases by .30 units.

Similarly, in terms of Hypotheses 1B, *risk & privacy* is positively associated with the *intention to adopt* with a weak effect (β =.06, p <.01) providing

support for hypothesis 1B. In other words, when *risk & privacy* increases by 1 unit, *intention to adopt* increases by .06 units.

In summary, both *advantages* and *risk & privacy* have positive associations with intentions to adopt with significant p-values (p <.01) at the 5% level. Therefore, we reject the null hypotheses in favour of the alternative hypotheses. Consequently, this provides support for both hypotheses 1A and 1B. It can be concluded that there is a significant relationship between the Attitude towards the advantages of Mobile Payment Services and the Intention to adopt.

4.4.2 Regression Results Pertaining to Perceived Behavioural Control

As mentioned earlier, the *perceived behavioural control* construct has two variables –*self-efficacy* and *facilitating conditions* (independent variables) – which load onto the *intention to adopt* (dependent variable). The *perceived behavioural control* construct therefore consists of both hypotheses 2A and hypothesis 2B.

As illustrated in table 4.3 (on page 69), the results pertaining to the *perceived behavioural control* construct are discussed below:

In terms of Hypotheses 2A, *self-efficacy* is positively associated with the *intention to adopt* with a strong effect (β =.31, p <.01) providing support for hypothesis 2A. In other words, when *self-efficacy* increases by 1 unit, *intention to adopt* increases by .31 units. It must be noted, that *self-efficacy* has the largest slope in comparison to the four other variables.

Similarly, in terms of Hypotheses 2B, *facilitating conditions* is positively associated with the *intention to adopt* with a moderate effect (β =.10, p <.01) providing support for hypothesis 2B. In other words, when *facilitating conditions* increases by 1 unit, *intention to adopt* increases by .10 units.

In summary, both *self-efficacy* and *facilitating conditions* have positive associations with intentions to adopt with significant p-values (p <.01) at the 5% level. Therefore, we reject the null hypotheses in favour of the alternative hypotheses. Consequently, this provides support for both hypotheses 2A and 2B. It can be concluded that perceived behavioural control has a significant relationship on the intention to adopt mobile payment services.

4.4.3 Regression Results Pertaining to Subjective Norms

As mentioned earlier, the *subjective norms* construct is associated with South African culture (independent variable) – which loads onto the *intention to adopt* (dependent variable). Hypothesis 3A is therefore associated with the *subjective norms* construct.

As illustrated in table 4.3 (on page 69), the results pertaining to the *subjective norms* construct are discussed below:

In terms of Hypotheses 3A, *subjective norms* is positively associated with the *intention to adopt* with a strong effect (β =.54, p <.01) providing support for hypothesis 3A. In other words, when *subjective norms* increases by 1 unit, *intention to adopt* increases by .54 units.

In summary, *subjective norms* has a positive association with intentions to adopt with a significant p-value (p <.01) at the 5% level. Therefore, we reject the null hypothesis in favour of the alternative hypothesis. Consequently, this provides support for hypotheses 3A. It can be concluded that *subjective norms* has a significant relationship on the intention to adopt mobile payment services.

4.5 Summary of analyses

The analyses performed in this chapter included descriptive statistics in the form of correlations, as well as the presentation and analysis of the SEM and linear regression output results.

The research demonstrated that all hypotheses were proved and relationships were significant. Therefore, each of the independent variables (*attitude, perceived behavioural control and subjective norms*) has a significant relationship on the intention to adopt (dependent variable) mobile payment services.

The next chapter, chapter 5, presents a discussion of the obtained results.

5 DISCUSSION OF RESULTS

5.1 Introduction

Chapter 4 included the presentation, description and analysis of the collected statistical data results. The core focus and structure of this chapter, chapter 5, explains and discusses the results in relation to the literature cited in this study with specific reference to the stated hypotheses. The structure of the results is presented in order of stated sub-problems and the tested hypotheses.

It must be highlighted that this research endeavored to contribute to knowledge, in the mobile payment services space, in which the research objective of this paper was specifically directed at understanding what influences consumer behaviour and the acceptance towards mobile payment services adoption in the South African market.

Against the outlined hypotheses and the established data, the intended outcomes were confirmed. This was achieved by applying a modified version of the decomposed Theory of Planned Behaviour model. In order to have tested and met the objective of this study, the constructs included in this study were the *Attitude* towards, the *Perceived Behavioural Control*, the *Subjective Norms* and the effects which these constructs had on the *Intention to adopt* mobile payment services.

Overall the results show good explanatory ability with few mixed results. The research results are summarised in two SEM models and a regression output table. Model 1, the original proposed theoretical model (a modified version of the decomposed Theory of Planned Behaviour model) is figure 4.1 on page 64, model 2, the *'*new recommended model with attitude in the middle*'* is figure 4.3 on page 66 and the regression output table is table 4.3 on page 71.

From the SEM output results, model 1, the “modified version of the decomposed Theory of Planned Behaviour model”, is a relatively conclusive with the exception of *risk & privacy* (β =.05) and *facilitating conditions* (β =.05) which are very weak. The strongest predictor in this model was *subjective norms* (β =.47) followed by *self-efficacy* (β =.31). The results of the SEM indicate that the factors within the model; *advantages, risk & privacy, self-efficacy, facilitating conditions and subjective norms*, may explain 79% of consumers rational towards the *intention to adopt* mobile payment services. These findings are consistent with that of similar studies done by (Hsu & Chiu, 2004; Jaruwachirathanakul & Fink, 2005; Shih & Fang, 2004) that have used a version of the decomposed theory of planed behaviour.

From the SEM output results, model 2, is a slight variation of model 1 whereby the SAS modification indices recommended that the *attitude* construct should be modeled to have a more direct effect on *the intention to adopt*. As a result, model 2 indicates that the factors *self-efficacy, facilitating conditions and subjective norms* may explain 83% of consumers *attitude* towards the *advantages* of mobile payment services as well as only 34% of consumers *attitude* toward the *risk & privacy* associated with using mobile payment services. In addition, model 2 attempts to explain that both *attitude* towards the *advantages* and the *risk & privacy* of mobile payment services account for 79% of consumers rational towards the *intention to adopt* mobile payment services.

The results of the SEM statistical results suggest that the *attitude* construct has a direct effect on consumer’s *intention to adopt* mobile payment services. This relationship was not previously identified in previous studies such as (Jaruwachirathanakul & Fink, 2005; Taylor & Todd, 1995) but was consistent with a study done by Ogutu, Njanja, and Ogutu (2014) and can be concluded that this finding potentially plays a more direct and significant role. A reason for this maybe due to cultural issues, location of studies and / or possible underlying assumptions made in these various studies. It is therefore encouraged that mobile payment service providers and retailers consider

attitude towards both the *advantages* and the *risk & privacy* of mobile payment services as a method to drive adoption of such services.

The results found from this research are potentially significant to mobile payment service providers, the banking industry, marketers, retailers and academics as it is the first time research attempts to gain a systemic understanding of the key factors and motivations that drive the potential adoption of mobile payment services in the South African market. These findings will not only provide useful insights for the South African market, but potentially also other developing and developed countries. That said however, ongoing research is always required in order to better fully and thoroughly understand what influences consumer behaviour and acceptance towards mobile payment services adoption in the South African market as it is an evolving and growing arena both locally and globally.

The research hypotheses for this study, as stated on page 32, 33 and 34 will now be discussed in relation to the research findings from Chapter 4.

5.2 Discussion pertaining to the Attitude Construct

Hypothesis one in this study directly refers to the *attitude* construct. As mentioned in the literature review, attitude in the case of mobile payment services is referred to as one's perception of the usefulness of mobile payment services. These include the *advantages* (H1A) and *risks and privacy* (H1B) which shape attitude towards the adoption of mobile payment services (Taylor & Todd, 1995).

Hypotheses 1A states, the greater the perceived *advantages* of using mobile payment services, the more likely mobile payment services will be adopted. The research findings within this study support this hypothesis. From the regression results, the proposed theoretical model indicates that a direct moderate positive relationship exists between *advantages* and the *intention to adopt* ($\beta = .30$, $p < .01$).

Consequently, it can be concluded that there is a significant relationship between the attitude towards constuct the *advantages* of mobile payment services and the *intention to adopt*. This ultimately concludes that the greater the perceived *advantages* of using mobile payment services, the more likely mobile payment services will be adopted. This result is supported by previous research done by Jaruwachirathanakul and Fink (2005), who also found a significant relationship between attitude towards the advantages and the Intention to adopt.

Hypothesis 1B states, the higher the privacy and the lower the perceived risk associated with using mobile payment services the more likely mobile payment services will be adopted. The research findings within this study support this hypothesis. From the regression results, the proposed theoretical model indicates that a direct, albeit weak, positive relationship exists between *risk & privacy* and the *intention to adopt* ($\beta = .06$, $p < .01$).

Consequently, we can conclude that there is indeed a significant relationship amongst the attitude towards *risk & privacy* and the *intention to adopt* mobile payment services. This ultimately concludes that the higher the privacy and the lower the perceived risk associated with using mobile payment services the more likely mobile payment services will be adopted. This result is supported by previous research done by Jaruwachirathanakul and Fink (2005), who also found a significant relationship between attitude towards the *risk & privacy* and the *intention to adopt*.

The results obtained in this study aid in better understanding consumers attitudes towards the adoption of mobile payment services in relation to the *advantages* and *risks and privacy.*

With the above findings in mind, this means that consumers are influenced by the degree to which the *advantages* of mobile payment services offers the user. The findings portray that the greater the perceived advantages of using a mobile payment service, the more likely that mobile payment services will

be adopted. That said, mobile payment services must provide value and benefits towards meeting the needs of its current day consumer.

It was found that the attitude towards *risk & privacy* has a significant influence on the *intention to adopt* mobile payment services. It can therefore be said that consumers are concerned with the associated *risk & privacy* of using a mobile payment services. A need exists to provide consumers with the confidence that privacy is not a concern. This finding is supported by both Jaruwachirathanakul and Fink (2005) and Shambare (2013).

This study found, that collectively the two attitudinal factors that make up the *attitude* construct, do positively influence consumer *intention to adopt* mobile payment services. This means that from an attitudinal perspective, a consumers perception of the *advantages* and the *risk & privacy*, do play a significant role in achieving the adoption of mobile payment services in the South African market. A study done by Nasri (2011), agrees with this studies findings, of a significant relationship between the respondents' Attitude towards as well as Risk & Privacy on the intention to adopt. That said however, further research in the South African market is required to better understand this relationship.

5.2.1 Discussion pertaining to the Perceived Behavioural Control Construct

Hypothesis two in this study directly refers to the *perceived behavioural control* construct. As mentioned in the literature review, perceived behavioral control in the case of mobile payment services is referred to an individual's belief that resources and opportunities exist and will either aid or hinder an individual to utilise mobile payment services. These include *self-efficacy* (H2A) and *facilitating conditions* (H2B) which shape the *perceived behavioural control* towards the adoption of mobile payment services (Taylor & Todd, 1995).

Hypotheses 2A states, the greater the self-efficacy toward using mobile payment services, the more likely mobile payment services will be adopted. The research findings within this study support this hypothesis. From the regression results, the proposed theoretical model indicates that a direct moderate positive relationship exists between *advantages* and the *intention to adopt* (β =.17, p <.01).

Consequently, it can be concluded that there is a significant relationship between *self-efficacy* and the *intention to adopt* mobile payment services. This ultimately concludes that the greater the *self-efficacy* toward using mobile payment services, the more likely mobile payment services will be adopted. This result is supported by previous research done by Jaruwachirathanakul and Fink (2005), who also found a significant relationship between *self-efficacy* and the Intention to adopt.

Hypotheses 2B states, the greater the *facilitating conditions* to mobile payment services, the more likely mobile payment services will be adopted. The research findings within this study support this hypothesis. From the regression results, the proposed theoretical model indicates that a direct weak-to-moderate positive relationship exists between *advantages* and the *intention to adopt* (β =.10, p <.01).

Consequently, we can conclude that there is a significant relationship between the *facilitating conditions* and the *intention to adopt* mobile payment services. This ultimately concludes that the greater facilitating conditions to mobile payment services, the more likely mobile payment services will be adopted. This result is supported by previous research done by Jaruwachirathanakul and Fink (2005), who also found a significant relationship between *facilitating conditions* and the *intention to adopt*.

The results obtained in this study aid in better understanding consumers perceived behavioural control towards the adoption of mobile payment services in relation to their *self-efficacy* and the *facilitating conditions*.

In accordance with both Jaruwachirathanakul and Fink (2005) as well as Shih and Fang (2004) this study too found a positive relationship between self-efficacy and the intention of consumers to adopt mobile payment services. It is therefore recommended, based on this studies results, that banks and mobile payment services providers make mobile payment services more user friendly and easy to sue in order to increase a consumer's *self-efficacy*.

Similarly, again in accordance with Jaruwachirathanakul and Fink (2005) as well as Shih and Fang (2004), this study too found a positive relationship between *facilitating conditions* and the *intention to adopt* mobile payment services. This means that not only do banks or mobile payment service providers have to provide ease of access and affordability for consumers, but also need to ensure that cellular network providers provide the necessary infrastructure and bandwidth for ease of operation. Consequently, we can conclude from the results that the greater the *facilitating conditions* to mobile payment services, the more likely mobile payment services will be adopted.

This study found that the *perceived behavioural control* construct, as a whole, categorically influences consumer *intention to adopt* a mobile payment services. This means that within a South African context, the resources and opportunities that exist either aid or hinder an individual, to utilise mobile payment services. Lastly, further additional research is in the South African market is required to better understand this relationship.

5.3 Discussion pertaining to the Subjective Norms Construct

Mobile payment services in South Africa are relatively new. *Subjective norms* are likely to be influenced by the many cultures within the South African population as well as peer pressure of social groups – this understanding is put to test further in this study. Social groups can include family, friends and individuals within the same social realm. Subjective norm is a powerful construct that aims to measure the social influences on an individual's behaviour. highlights that subjective norm is significant in forecasting

customer intention to engage with mobile payments, transactions and commerce. It must be noted that Subjective Norms is an independent variable.

Hypothesis three in this study directly refers to the *subjective norms* construct. As mentioned in the literature review, *subjective norms* is a powerful construct that aims to measure the social influences on an individual's behaviour and / or by the many cultures within the South African population as well as peer pressure of social groups (Lutz, 1980). As a result, *subjective norms* is referred to as the South African culture.

Hypotheses 3A states, *subjective norms* (South African culture) has a significant influence on the adoption of mobile payment services. The research findings within this study support this hypothesis. From the regression results, the proposed theoretical model indicates that a direct strong positive relationship exists between *subjective norms* and the *intention to adopt* ($\beta = .54$, $p < .01$).

Consequently, it can be concluded that there is a significant relationship between *subjective norms* and the *intention to adopt* mobile payment services. Consequently, it can be concluded that South African culture has a significant influence on the adoption of mobile payment services. This finding is particularly interesting as the Jaruwachirathanakul and Fink (2005) study in Thailand found that subjective norms had insignificant influence on adoption. Their study found that Thai consumers were influenced by only Attitude and Perceived Behavioural Control but not by Subjective Norms. This finding is similar to Shih and Fang (2004) done in Taiwan, where their findings, like Jaruwachirathanakul and Fink (2005), showed that Subjective Norms is non-significantly related to the Intention to Adopt.

The results obtained in this study aid in better understanding the South African culture towards the adoption of mobile payment services. It was found found that *subjective norms* (South African culture) do influence the adoption of mobile payment services. This means that South African consumers are

influenced by the many cultures within the South African population and more specifically around peer pressures from their social groups.

5.4 Conclusion

In relation to this studies research objectives, to identify the factors that drive consumers to adopt mobile payment services in the South African market, the above ultimately proves to be successful and influences consumer decision making, consumer behaviour and the factors that drive consumers to adopt mobile payment service from a South African market perspective.

From the above discussion of results it can therefore be established that an intention to adopt mobile payment services by consumers in the South African market exists. This study found that all three constructs included in the proposed model, *attitude*, *perceived behavioural control* and *subjective norms*, all have a significant influence on the *intention to adopt* mobile payment services. In addition, there is intention to adopt mobile payment services by consumers in the South African market. Due to consumers having an interest to adopt mobile payment services offered by retailers, they therefore need to ensure these payment services meet the sensitivity needs of its clients.

As emphasize by Shih and Fang (2004), there has been little research done that uses a decomposed Theory of Planned Behaviour model to discuss the intention to adopt new innovations. This study contributes to the understanding towards improving relationships that are included in the conceptual model. This studies finding's ultimately improves the understanding of these relationships and provides new knowledge for marketers, bankers and academics. Lastly, this study has provided evidence in support of the tested hypotheses.

6 CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

The previous chapter concentrated on the discussion of the results of the statistical data collected. Whereas, this chapter outlines the conclusion to this research study followed by recommendations and managerial implications for marketers, mobile payment services providers, academics and banks. In conclusion to this chapter, areas of possible future research and a series of study limitations is provided along with a final conclusion to the research paper.

6.2 Conclusion of the study

This research endeavored to contribute to knowledge, in the mobile payment services space, where the main research problem was to identify and assess the consumer behaviour factors that impact upon the adoption of mobile payment services in the South African market. Against the outlined hypotheses and the established data, the intended outcomes were confirmed. This was achieved by applying a modified version of the decomposed Theory of Planned Behaviour model.

As documented earlier, in order to have tested and meet the objective of this study, the constructs included in this study were the *Attitude* towards, the *Perceived Behavioural Control*, the *Subjective Norms* and the effects which these constructs had on the *Intention to adopt* mobile payment services. This study has demonstrated theses factors and has highlighted that there is indeed an intention to adopt mobile payment services within a South African context.

From the collected and analysed findings, it can be concluded that the *attitude* construct (*attitude towards* and the *risk & privacy*) is positively associated and has a significant relationship with the intention to adopt mobile payment services. These finding are echoed by both Jaruwachirathanakul and Fink (2005) and Shambare (2013) in which the *attitude* construct needs to have a positive and significant relationship or customers may avoid the use or adoption of such services. In a study conducted by Kuo and Yen (2009) it is mentioned that attitude is a powerful construct in measuring consumer adoption. As a result, mobile payment service providers should be a core focus during implementation and marketing.

With regards to consumers *perceived behavioural control* (*self-efficacy* and *facilitating conditions*) this construct is positively associated and has a significant relationship with the *intention to adopt* mobile payment services. It must be noted that *self-efficacy* had the strongest relationship with the intention to adopt in comparison to the other four variables. These findings are in accordance to findings from both Similarly, (Kuo & Yen, 2009) highlights the strength of the *perceived behavioural* construct and its importance on the influencing power on the *intention to adopt*.

Lastly, the subjective norms construct demonstrated a positive and significant relationship with the intention to adopt. As mentioned earlier, this finding is particularly interesting as the Jaruwachirathanakul and Fink (2005) study in Thailand found that subjective norms had insignificant influence on adoption. Their study found that Thai consumers were influenced by only Attitude and Perceived Behavioural Control but not by Subjective Norms. This finding is similar to Shih and Fang (2004) done in Taiwan, where their findings, like Jaruwachirathanakul and Fink (2005), showed that Subjective Norms is non-significantly related to the Intention to Adopt.

With the above in mind, the results from this modified version of the decomposed TPB model is an effective and appropriate model for investigating the adoption of mobile payment services in South Africa. As mentioned in the literature review, the decomposed TPB model is most

suitable for steering decision makers towards the implementation of innovations where this studies findings can ultimately assist in this (Taylor & Todd, 1995).. The findings therefore provide insight into understanding consumers' individual attitudes, subjective norms and perceived behavioural control, which ultimately influences the likelihood of consumers using mobile payment services.

6.3 Recommendations & Managerial Implications

Proposed outcomes previously highlighted and mentioned that were based on the results of set hypotheses, in terms of a series of potential adoption strategies for the mobile payment services and South African banking market would be provided. As a result the following section intends on achieving this, and too presenting possible managerial implications and recommendations.

By having an understanding of the factors that influence consumer behaviour and acceptance towards mobile payment services adoption in the South African market, this allows marketers, providers, retailers and bankers to channel resources and methods, efficiently and effectively towards capitalizing on the first to market position, heightening customer satisfaction results and exceeding shareholder expectations on ROE.

Adding to the model construct findings, demographic results found in this study can assist marketers, retailers, service providers and bankers in better marketing efforts, further expanding their market shares, and a tool to devise communication strategies in order to encourage and boost the usage and adoption of mobile payment services to both new and existing customers.

Mobile payment services in South Africa is in an emerging phase. As a result awareness of such a platform is essential in the early adoption stages. A suggested starting point as a strategy to increase adoption, reveals that *subjective norms* (South African Culture) showed that the South African Culture is significantly responsive to mobile payment services. Linked to this

was self-efficacy, which demonstrated the second strongest relationship on the intention to adopt, whereby South Africans believe that they have the self-esteem, confidence and ability in using such a service. It must also be said that, the *attitude* towards the *advantages* of using a mobile payment service greatly influences the adoption thereof. That said however, all factors within the model positively influence the adoption of mobile banking applications.

It is still vital for banks to communicate and facilitate the *advantages* of mobile banking applications and how mobile payment services differ from traditional channels of payment such as physical banking cards, internet banking transfers or cash.

In its simplicity, mobile payment services provide the following benefits as compared to traditional payment services: Ability to pay and transact with a retailer or merchandiser anytime or anywhere without the need of cash or cards, the ability to make transactions or payments to anyone from a mobile device, instant access to latest information of various retailers using such a system, a safer method of conducting payment related needs, a reduction in distribution costs for banks which in theory decreases consumer banking fees, increases customer satisfaction and attrition rates, builds brand equity as well as product image (gaining competitive advantage over competitors), serves as a source of revenue for banks and or mobile payment services providers, and lastly provides banks, retailers and marketers with a better understanding of customer needs and wants.

Another important implication is the associated *risk & privacy* aspect around mobile payment services. Mobile payment services providers, retailers bankers and marketers will need to focus communication strategies in this area as respondents in this study indicated mixed feelings towards this possible inhibiting factor. Therefore these stakeholders need to visually demonstrate security and reliability in using and transacting through a mobile payment service in order to increase trust and decrease any deterring factors amongst consumers.

A suggested recommendation for mobile payment service providers and / or banks is to offer technology focused mobile payment stores and / or sections within banks or offices in order to increase customer understanding of such technology. This in turn will increase adoption, usage and satisfaction rates. Mobile payment service focused stores will thus provide a channel for consumers to try and test a mobile payment service as well as deal with questions and concerns that are possible inhibiting factors. In addition, these stores have the potential to market new innovations and product offerings, be revenue generating channels and build on brand equity.

The Marketing Concept, as identified by Jansen Van Rensburg and Venter (2011), states that if organisation objectives are to be catapulted ahead of their competitors organisations must deliver on a concerted effort of value creation.

The contribution of this research is intended to afford mobile payment service providers, retailers, banks, marketers and academics to draw from in terms of understanding what influences consumer behaviour and acceptance towards mobile payment services adoption in the South African market in order to gain a competitive advantage amongst competitors.

Today's technological development landscape allows for marketers to drive banks towards almost instant implementation, as mobile applications are relatively quick and easy to develop and be introduced to its market. The cost of an apps development is minimal when compared to the costs of other payment / banking product development and the savings of operating costs are immense Sikorsky (2013).

A final recommended strategy for marketers to accelerate the adoption and use of the mobile payment services is to ensure that its communication plan is focused on its targeted market and does is not executed in a shotgun approach.

6.4 Suggestions for further research

During the process and from the findings of this research, this study presents possible areas of future research that can be done.

Future research can identify possible attitudes towards specific *features* as well as new innovation ideas of future features to be provided in the development of mobile payment services. Features of mobile payment services was not covered in this study however, previous studies, albeit not done on mobile payment services, have used a version of the decomposed TPB, TAM, TRA or other models, have included this construct (Alhudaithy & Kitchen, 2009; Jaruwachirathanakul & Fink, 2005; Zmijewska, Lawrence, & Steele, 2004b).

As a result, the main problem statement for such an area of future research can potentially read – "*to identify and assess how the features of mobile payment services contribute to the intention to adoption construct in the South African market*"

Future studies can apply and compare the Pure Theory of Planned Behaviour, the Theory of Reasoned Action, the Technology Acceptance Model or Rodgers Theory of Innovation in relation to mobile payment services intention to adopt and consumer behaviour thereof. Upon conduction such research do a meta-analysis of such results drawing managerial implications and recommendations from such findings.

As a result, the main problem statement for such an area of future research can potentially read – "*to identify and assess the consumer behaviours factors using the TPB / TRA / TAM model(s) that impact upon the adoption of mobile payment services in the South African context*"

This study highlighted a second model, model 2, where the SAS modification indices recommended that the *attitude* construct should be modeled to have a more direct effect on *the intention to adopt*. As seen from the literature, this

models relationships are not peculiar to literature findings and can therefore be used in future research. This model can therefore be studied across contexts or cultures to further understand the rational of these constructs behaviours and their relationships, with an aim to create or add to the body of literature. This is therefore an opportunity to resolve this for future research.

As will be mentioned in the limitation section below, this study was conducted in Johannesburg, South Africa. Further research can therefore be conducted in other provinces around South Africa.

From a statistical perspective, this future research can examine these factors, using the same theoretical model, by using exploratory factor analysis and not confirmatory factor analysis. Exploratory factor analysis, in simple terms, uses the data set and literally explores the factor structure for underlying relationships taking no assumptions of the data into account (Williams, Brown, & Onsman, 2010)

Lastly, future research can examine the differences as to why consumers make use of different payment mechanisms in different contexts as well as exploring appropriate and relevant communication channels with recommendations to marketers from a 21st century perspective.

6.5 Limitations of the Study

Whist this research paper has identified significant recommendations and findings, limitations within this study are not excluded and are listed below:

This research paper applied a “modified version of the decomposed Theory of Planned Behaviour” model which made use of four main constructs *(attitude, perceived behavioural control, subjective norms* and *intention to adopt),* which incorporated six factors. These factors were specifically used to examine what influences consumer behaviour towards adopting mobile payment services. Having said this, there may be additional factors that influence the adoption of mobile payment services that are not examined in this study.

Secondly, due to time and monetary constraints the sample size in this study was limited and made use of convenience sampling. The sample size totaled 215 respondents. Due to other sampling methods being suitable, the sampling method used in this study could be viewed as a limitation. Similarly, the time frame of the collection of data is a delimitation were the time frame is delimited to a one month period (November 2014). This therefore limits the magnitude of the study.

Another limitation is that questionnaires completed by respondents may not have been completed truthfully due to the lack of topic understanding or their ability to understand or complete the questionnaire to the best of their ability.

Further to this, this study was limited to Johannesburg, South Africa as well as respondents from the University of the Witwatersrand. Further research may therefore be conducted in other provinces around South Africa as well as other parts of the world.

Lastly, this study also included users and non-users focused only towards mobile payment services. This study was limited to specific age groups these being between 18 and 65 years.

6.6 Conclusion

There has been a significant amount of development in the mobile payment and banking arena in South Africa and as a result financial institutions are constantly having to evolve in order to meet the needs of its consumers. Banks are also driven by shareholders who insist on respectable returns on their investments. This study therefore makes a contribution to the understanding what influences consumer behaviour and acceptance towards mobile payment services adoption in the South African market so as to ensuring that mobile payment service providers, banks and retailers do evolve and shareholders do achieve their strategic imperatives.

This dissertation is comprised of an in-depth and thorough review of literature, calculating the necessary and applicable statistical tests, as well as having examined, explored and completed a quantitative research study with the primary objective of understanding and identifying consumer behaviour, acceptance and adoption strategies for mobile payment services in Johannesburg, South Africa.

With the results in mind, one can conclude that the proposed theoretical framework model supports the results found in this research study. The findings of this research which were focused towards, *attitude, perceived behavioural control and subjective norms* do have a significant relationship on the *intention to adopt* mobile payment services. In terms of the hypotheses set and tested, all resulted as postulated.

Africa is the second largest mobile market in the world in which South Africa is the third largest country on the continent with the most mobile subscribers. More specifically, South Africa has a mobile phone subscription penetration rate of over 100% (Ber & Sinha, 2012). Consequently, cell phone banking has proved successful over the years in South Africa (Bankole et al., 2012). From the findings it is evident that the emerging market of mobile payment services is steadily increasing, and has the potential along side regular cell phone banking to become the most widely used payment channel in years to come.
In closing, this dissertation equips, strengthens and adds to the knowledge wheel for stakeholders within the banking and retail industry, marketers, mobile payment services developers and ultimately academics. It is recommended that the factors that encourage consumers to adopt mobile payment services are noted and utilised to exploit the conversion rate of customers towards adopting mobile payment services.

Finally foreign bankers and marketers could potentially utilise the established results to capitalize on mobile payment services adoption opportunities in their own markets.

7 REFERENCES

Absa. (2014). Payment Pebble. Retrieved 11 September, 2014, from http://www.absa.co.za/Absacoza/Small-Business/Supporting/Payment-Pebble

Airasian, P., & Gay, L. (2000). *Educational Research: Competencies for Analysis and Application* (6th ed.). New Jersey: Pretentice Hall.

Ajzen, I. (1985). From Intentions to Actions: A Theory of Planned Behavior. In J. Kuhl & J. Beckmann (Eds.), *Action Control* (pp. 11-39): Springer Berlin Heidelberg.

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Ajzen, I. (2002). *Constructing a TPB questionnaire: Conceptual and Methodological Considerations*. Huangqi Cheng Teacher Pages. China. Retrieved from http://chuang.epage.au.edu.tw/ezfiles/168/1168/attach/20/pta_41176_7688352_57138.pdf

Al-Khouri, A. (2013). Identity and Mobility in a Digital World. *Technology and Investment, 4*(1), 7-12.

Alafeef, M., Singh, D., & Ahmad, K. (2011). Influence of Demographic Factors on the Adoption Level of Mobile Banking Applications in Jordan. *Research Journal of Applied Sciences, 6*(6), 373-377.

Alhudaithy, A. I., & Kitchen, P. J. (2009). Rethinking models of technology adoption for internet banking: The role of website features. *Journal of Financial Services Marketing, 14*(1), 56-69.

Amin, H. (2008). Factors affecting the intentions of customers in Malaysia to use mobile phone credit cards. *Management Research News, 31*(7), 493-503.

Apple. (2014, 11 September 2014). Apple Pay. Retrieved 12 September, 2014, from http://www.apple.com/iphone-6/apple-pay/

Arvidsson, N. (2014). Consumer attitudes on mobile payment services–results from a proof of concept test. *International Journal of Bank Marketing, 32*(2), 150-170.

Babbie, E., & Mouton, J. (2001). *The Practice of Social Research* (Vol. 1). Cape Town: Oxford University Press Southern Africa.

Bailey, A. (2004). *Challenges and Opportunities For Interaction on Mobile Devices*. Paper presented at the Proc. COLING, Geneva, Switzerland.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review, 84*(2), 191.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American psychologist, 37*(2), 122.

Bank Administration Institute, B. (2012). BAI-Finacle Global Banking Innovation Awards 2012. http://www.bai.org/globalinnovations/docs/misc_documents_2012/global_awards_program_post-(1).pdf?sfvrsn=2

Bankole, F., Bankole, O., Brown, I., & Cloete, E. (2012). Cell Phone Banking: Revisiting Predictors of Adoption in South Africa. *Association for Information Systems, 10*, 1 - 13.

Barnes, T. (2012). *Factors Motivating South Africans to Shop for Apparel Online*. Unpublished Thesis. School of Economics of Business Science. Wits Business School. Johannesburg.

Bauer, H. H., Barnes, S. J., Reichardt, T., & Neumann, M. M. (2005). Driving Consumer Acceptance of Mobile Marketing: A Theoretical Framework and Empirical Study. *Journal of Electronic Commerce Research, 6*(3), 181-192.

Ber, G., & Sinha, A. (2012). South African Mobile Generation. *Study on South African Young People on Mobiles*. http://www.unicef.org/southafrica/SAF_resources_mobilegeneration.pdf

Bhengu, B. (2013, 22 May 2013). MTN Mobile Money puts banking in your pocket. *Press Release issued by MTN business.* Retrieved 30 June, 2013, from http://www.itweb.co.za/index.php?option=com_content&view=article&id=64248

Brown, I., Cajee, Z., Davies, D., & Stroebel, S. (2003). Cell phone banking: predictors of adoption in South Africa—an exploratory study. *International Journal of Information Management, 23*(5), 381-394. doi: 10.1016/s0268-4012(03)00065-3

Calder, B. J., Phillips, L. W., & Tybout, A. M. (1982). The concept of external validity. *Journal of Consumer Research*, 240-244.

Chase. (2012). Cutting Through the Mobile Paymenrs Confusion. *What Canadian Merchants Need to Know*. http://en.chasepaymentech.ca/documents/mobile_payments_whitepaper.pdf

Chau, P. Y., & Hu, P. J.-H. (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: an empirical test of competing theories. *Information & management, 39*(4), 297-311.

Chau, P. Y., & Hu, P. J. H. (2001). Information technology acceptance by individual professionals: A model comparison approach*. *Decision Sciences, 32*(4), 699-719.

Cheah, C.-M., Teo, A.-C., Ooi, K.-B., & Wong, J. C. (2013). *Extending The Utaut Model in M-Banking Adoption.* Paper presented at the Diversity, Technology, and Innovation for Operational Competitiveness: Proceedings of the 2013 International Conference on Technology Innovation and Industrial Management.

Chen, C. (2013). Perceived risk, usage frequency of mobile banking services. *Managing Service Quality, 23*(5), 410-436.

Chen, S.-W., Yang, C.-H., & Liu, C.-T. (2011). *Design and implementation of live SD acquisition tool in android smart phone.* Paper presented at the Genetic and Evolutionary Computing (ICGEC), 2011 Fifth International Conference on.

Connaway, L. S., & Powell, R. R. (2010). *Basic Research Methods for Librarians* (5 ed.). Santa Barbara, CA: Libraries Unlimited.

Corbin, J., & Strauss, A. (2008). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (3 ed.). Thousand Oaks, California: Sage Publications.

Crabbe, M., Standing, C., Standing, S., & Karjaluoto, H. (2009). An adoption model for mobile banking in Ghana. *International Journal of Mobile Communications, 7*(5), 515-543.

Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Past, present and future of mobile payments research: A literature review. *Electronic Commerce Research and Applications, 7*(2), 165-181.

Dapp, T. F., Stobbe, A., & Wruuck, P. (2012). The Future of (mobile) Payments: New (online) Players Competing With Banks. *Deutsche Bank Research*, 1-32. http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD0000000000298950/The+future+of+(mobile)+payments%3A+New+(online)+players+competing+with+banks.PDF

Davis, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: theory and results.* (PHD), Massachusetts Institute of Technology, Massachusetts.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.

Davis., F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of two Theoretical Models. *Management Science, 35*(8), 982-1003.

Ericsson. (2014). Ericsson Mobility Report On The Pulse Of The Networked Society (Vol. Quarter 4). Ericsson Website: Ericsson.

First National Bank. (2012). Promotion Innovation. Retrieved 29 June, 2013, from https://www.fnb.co.za/innovation/index.html

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. MA: Addison-Wesley.

FlickPay. (2014). How it works. Retrieved 12 July 2014, 2014, from http://www.flickpay.co.za

Flood, D., West, T., & Wheadon, D. (2013). Trends in mobile payments in developing and advanced economies. *RBA Bulletin*, 71-80.

Galpin, J. (2013). *University of the Witwatersrand School of Statistics and Acturual Science Course Notes for Statistical Research Desing and Analysis* (R. Krommenhoek Ed.). University of the Witwatersrand University of the Witwatersrand, School of Statistics and Acturual Science.

Gerber-Nel, C., & Kotze, T. (2012). *Marketing Research* (M. Cant Ed. 7 ed.). Pretoria: Van Schaik Publishers.

Goldstuck, A., Edwards, P., & Singh, H. (2014). Mobile Banking: Opportunities and Challenges in 2014. Retrieved 2 July 2014, 2014, from http://www.technologybanker.com/magazine-features/mobile-banking-opportunities-and-challenges-in-2014 - .U7POBha5JfM

Gupta, S. (2013). The Mobile Banking and Payment Revolution. *European Financial Review*, 3-6.

Gupta, S., & Herman, K. (2012). Bank of America: Mobile Banking. *HBS Case*(510-063).

Harri, O.-K., Harri, O., Virpi, K., & Arieste, O. (2003). Developing successful mobile applications. *reason, 394*, 054.

Harris, L. (2012). Mobile Banking in South Afica: Can MTN crack the market second time around? Retrieved 30 June, 2013, from http://www.zdnet.com/mobile-banking-in-south-africa-can-mtn-crack-the-market-second-time-around-7000008081/

Hill, T., Smith, N. D., & Mann, M. F. (1986). Communicating innovations: Convincing computer phobics to adopt innovative technologies. *Advances in Consumer Research, 13*(1), 419-422.

Holden, W., Dr. (2014, 10 September 2014). Mobile Payments to Rise 40% This Year, Juniper Research Finds. from http://www.juniperresearch.com/viewpressrelease.php?pr=437

Holzinger, A., Nischelwitzer, A., & Meisenberger, M. (2005). *Mobile Phones as a Challenge for m-learning: Examples for Mobile Interactive Learning Objects (MILOs).* Paper presented at the Pervasive Computing and Communications Workshops, 2005. PerCom 2005 Workshops. Third IEEE International Conference on.

Hsu, M.-H., & Chiu, C.-M. (2004). Predicting electronic service continuance with a decomposed theory of planned behaviour. *Behaviour & Information Technology, 23*(5), 359-373.

Huang, H. (2008). The impact of mobile devices on SMEs in Auckland, New Zealand.

Hutton, J. (2011). Mobile Phone Dominate in South Africa. *Mobile.* Retrieved 1 July, 2013, from http://www.nielsen.com/us/en/newswire/2011/mobile-phones-dominate-in-south-africa.html

International, B. M. (2014). Q3 South African Telecommunications Report. Business Monitor International Website: **Business Monitor International**.

Jansen Van Rensburg, M., & Venter, P. (2011). *Strategic Marketing*. Cape Town, South Africa: Oxford University Press.

Jaruwachirathanakul, B., & Fink, D. (2005). Internet banking adoption strategies for a developing country: the case of Thailand. *Internet Research, 15*(3), 295-311. doi: 10.1108/10662240510602708

Jen-Her, W., & Shu-Ching, W. (2005). What drives mobile commerce?: An empirical evaluation of the revised technology acceptance model. *Information & management, 42*(5), 719-729.

Kamuti, T. (2013). The mobile revolution in Africa and conservation communication. Retrieved 19 July, 2013, from http://www.consultancyafrica.com/index.php?option=com_content&view=article&id=1271:the-mobile-revolution-in-africa-and-conservation-communication&catid=92:enviro-africa&Itemid=297

Keshav, S. (2005). Why cell phones will dominate the future internet. *ACM SIGCOMM Computer Communication Review, 35*(2), 83-86.

Khalifa, M., & Cheng, S. K. (2002). *Adoption of mobile commerce: role of exposure.* Paper presented at the PROCEEDINGS OF THE ANNUAL HAWAII INTERNATIONAL CONFERENCE ON SYSTEM SCIENCES.

Khraim, H. S., Shoubaki, Y., & Khraim, A. S. (2011). Factors Affecting Jordanian Consumers' Adoption of Mobile Banking Services. *International Journal of Business and Social Sciences, Volume No*.

Kim, C., Mirusmonov, M., & Lee, I. (2010). An empirical examination of factors influencing the intention to use mobile payment. *Computers in Human Behavior, 26*(3), 310-322.

Kim, G., Shin, B., & Lee, H. G. (2009). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal, 19*(3), 283-311.

Kshetri, N., & Acharya, S. (2012). Mobile payments in emerging markets. *IT Professional, 14*(4), 9-13.

Kuo, Y.-F., & Yen, S.-N. (2009). Towards an understanding of the behavioral intention to use 3G mobile value-added services. *Computers in Human Behavior, 25*(1), 103-110.

Laforet, S., & Li, X. (2005). Consumers' attitudes towards online and mobile banking in China. *International Journal of Bank Marketing, 23*(5), 362-380.

Lascaris, R. (2012, 25 March 2012). South Africa: More consumers use cellphones than listen to radio or watch TV. 120. 2012, from http://www.balancingact-africa.com/news/broadcast/issue-no120-0/broadcast/south-africa-more-co/bc

Laukkanen, T. (2007). Internet vs mobile banking: comparing customer value perceptions. *Business Process Management Journal, 13*(6), 788-797.

Laukkanen, T., Sinkkonen, S., Laukkanen, P., & Kivijarvi, M. (2008). Segmenting bank customers by resistance to mobile banking. *International Journal of Mobile Communications, 6*(3), 309-320.

Lee, G. (2015). *Business Statistics Made Easy in SAS*. Johannesburg: Silk Root Press.

Lee, M. S., McGoldrick, P. J., Keeling, K. A., & Doherty, J. (2003). Using ZMET to explore barriers to the adoption of 3G mobile banking services. *International Journal of Retail & Distribution Management, 31*(6), 340-348.

Lee, S., Lee, S., & Kim, Y. (2007). Factors influencing the adoption behavior of mobile banking: a South Korean perspective. *Journal of Internet Banking and Commerce, 12*(2), 1-9.

Leedy, P., & Ormrod, J. (2010). *Practical Research: Planning and Design* (9 ed.). New Jersey: Pearson Education Inc.

Liébana-Cabanillas, F., Sánchez-Fernández, J., & Muñoz-Leiva, F. (2014). Antecedents of the adoption of the new mobile payment systems: The moderating effect of age. *Computers in Human Behavior, 35*, 464-478.

Lind, D., Mason, R., & Marchal, W. (1999). *Basic Statistics for Business and Economics* (3 ed.). New York: McGraw Hill Higher Education.

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.

Lutz, R. J. (1980). *The role of attitude theory in marketing*. Los Angeles: University of California, Center for Marketing Studies.

Maduku, D. K. (2012). *Understanding retail bank customers' attitude towards and usage of cell phone and internet banking services in Gauteng, South Africa.* (Masters in Commerce), University of Johannesburg, Johannesburg.

Mail & Guardian. (2011). Will the mobile wallet replace the leather wallet? Retrieved 1 July, 2013, from http://mg.co.za/article/2011-05-18-will-the-mobile-wallet-replace-leather

Malhotra, N., & Birks, D. (2003). *Marketing Research: An Applied Approach* (Vol. 2). New York: Pearson Education.

Malhotra, N. K. (2005). Attitude and affect: new frontiers of research in the 21st century. *Journal of business research, 58*(4), 477-482.

Malhotra, N. K., & Peterson, M. (2006). *Basic marketing research: a decision-making approach* (2 ed.). Upper Saddle River, New Jersey: Prentice Hall.

Mallat, N. (2007). Exploring consumer adoption of mobile payments–A qualitative study. *The Journal of Strategic Information Systems, 16*(4), 413-432.

Marti-Parreño, J., Sanz-Blas, S., Ruiz-Mafe, C., & Aldás-Manzano, J. (2013). Key Factors Of Teenagers' Mobile Advertising Acceptance. *Industrial Management & Data Systems, 113*(5), 7 - 7.

Mattila, M. (2003). Factors affecting the adoption of mobile banking services. *Journal of Internet Banking and Commerce, 8*(1), 0306-0304.

McNeil, D. H. (2012). *Older adults' perceptions of financial technologies.* (Masters of Arts), McMaster University, Ontario, Canada. Retrieved from http://tinyurl.com/pxbquvv

Miller, P. G., Strang, J., & Miller, P. M. (2010). *Addiction Research Methods* (1st ed.). West Sussex: Wiley-Blackwell.

Mlitwa, N., & Tshetsha, N. (2012). Adoption of Cell-Phone Banking among Low-Income Communities in Rural Areas of South Africa. *iBusiness, 4*.

Mogale, O. (2013). Mobile Banking Series: An overview of why mobile banking remains important for financial inclusion in Africa. *Financial Services, Telecoms, KPMG*. http://www.blog.kpmgafrica.com/mobile-banking-series-overview-why-mobile-banking-remains-important-financial-inclusion-africa/

Moodycliffe, H. (2014). Is Africa still leading the global mobile payments innovation race. Retrieved 12 September 214, 2014, from http://www.bizcommunity.com/Article/410/78/115428.html

MTN. (2012). Mobile Money. Retrieved 30 June, 2013, from https://www.mtn.co.za/MTNServices/MoneyServices/Pages/MobileMoney.aspx

Nasri, W. (2011). Factors Influencing the Adoption of Internet Banking in Tunisia. *International Journal of Business and Management, 6*(8). doi: 10.5539/ijbm.v6n8p143

Ndubisi, N. O. (2004). *Factors influencing e-learning adoption intention: Examining the determinant structure of the decomposed theory of planned behaviour constructs*. Paper presented at the HERDSA International Conference Proceeding, Miri, Sarawak.

Ndubisi, N. O., & Sinti, Q. (2006). Consumer attitudes, system's characteristics and internet banking adoption in Malaysia. *Management Research News, 29*(1/2), 16-27.

Ogutu, R., Njanja, L., & Ogutu, M. (2014). The moderating effect of subjective norms, perceived behavioural control and gender on the relationship between attitude towards internet advertising and purchase intention of university students In Kenya. *International Journal of Social Sciences and Entrepreneurship, 1*(13), 495-525.

Ondrus, J., & Lyytinen, K. (2011). *Mobile Payments Market: Towards Another Clash of the Titans?* Paper presented at the Mobile Business (ICMB), 2011 Tenth International Conference on.

Paelke, V., Reimann, C., & Rosenbach, W. (2003). *A Visualization Design Repository for Mobile Devices.* Paper presented at the Proceedings of the 2nd international conference on Computer graphics, virtual Reality, visualisation and interaction in Africa.

Pedersen, P. E. (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.

Pedersen, P. E., & Ling, R. (2003). *Modifying adoption research for mobile Internet service adoption: Cross-disciplinary interactions.* Paper presented at the System Sciences, 2003. Proceedings of the 36th Annual Hawaii International Conference on.

Petrova, K. (2004). *Mobile commerce adoption: End-user/customer views*. Paper presented at the GBATA International Conference, Cape Town, South Africa. http://aut.researchgateway.ac.nz/bitstream/handle/10292/851/KPetrova_GBATA04.pdf.txt?sequence=2

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research, 14*(3), 224-235.

Polatoglu, V., & Ekin, S. (2001). An empirical investigation of the Turkish consumers' acceptance of Internet banking services. *International Journal of Bank Marketing, 19*(4), 156-165.

Pousttchi, K., & Schurig, M. (2007). *Assessment of today's mobile banking applications from the view of customer requirements.* Paper presented at the System Sciences, 2004. Proceedings of the 37th Annual Hawaii International Conference on.

Power, D. J. (2013). Mobile decision support and business intelligence: an overview. *Journal of Decision Systems, 22*(1), 4-9.

Pranata, l., Athauda, R., & Skinner, G. (2013). Determining Trustworthiness and Quality of Mobile Applications *Mobile Wireless Middleware, Operating Systems, and Applications* (pp. 192-206): Springer.

Püschel, J., Mazzon, J. A., & Hernandez, J. M. C. (2010). Mobile banking: proposition of an integrated adoption intention framework. *International Journal of Bank Marketing, 28*(5), 389-409.

Reardon, M., & Tibken, S. (2014). Apple takes NFC mainstream on the iPhone 6 and Apple Watch with Apple Pay. Retrieved 11 September 2014, 2014, from http://www.cnet.com/news/apple-adds-nfc-to-iphone-6-with-apple-pay/

Republic of South Africa. (2009). *Protection of Personal Information Bill*. (Government Gazette No. 32495). Minister of Justice and Constitutional Development Retrieved from

http://www.justice.gov.za/legislation/bills/B9-2009_ProtectionofPersonalInformation.pdf.

Rodríguez-Ardura, I., Ryan, G., & Gretzel, U. (2012). Special Issue on Qualitative Approaches to E-marketing and Online Consumer Behaviour: Guest Editors' Introduction. *Journal of Theoretical and Applied Electronic Commerce Research, 7*(2), IV - V.

Rogers, E. M. (1983). *Diffusion of Innovations* (Third ed.). New York: Free Press.

Rouillard, J. (2008). *Contextual QR codes*. Paper presented at the Computing in the Global Information Technology, ICCGI 08. The Third International Multi-Conference, Athens.

Salehi, M., & Alipour, M. (2014). E-banking in emerging economy: empirical evidence of Iran. *International Journal of Economics and Finance, 2*(1), p201.

Schierz, P. G., Schilke, O., & Wirtz, B. W. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications, 9*(3), 209-216.

Schmidt, E., & Cohen, J. (2013). *The New Digital Age: Reshaping the Future of People, Nations and Business*. New York: Knopf Publishing Group.

ScreenAfrica. (2014, 19 February 2014). Africa's digital penetration in 2014. Retrieved 2 July, 2014, from http://www.screenafrica.com/page/news/mobile-tv/1639686-Africas-digital-penetration-in-2014 - .U7PbHha5JfM

Shambare, R. (2011). Cell phone banking adoption in South Africa. *Business and Economic Research, 1*(1), 1 - 15.

Shambare, R. (2013). Factors Influencing the Adoption of Cell Phone Banking by South African Students. *African Journal of Business Management, 7*(1), 30-38.

Sherman, M. (2014). *An introduction to mobile payments: market drivers, applications, and inhibitors.* Paper presented at the Proceedings of the 1st International Conference on Mobile Software Engineering and Systems.

Shih, Y.-Y., & Fang, K. (2004). The use of a decomposed theory of planned behavior to study Internet banking in Taiwan. *Internet Research, 14*(3), 213-223.

Shon, J.-h., & Ok, S.-j. (2010). *The determinant of Internet banking usage behavior in Korea: A comparison of two theoretical models*. UNISA. Johannesburg.

Siau, K., & Shen, Z. (2003). Building customer trust in mobile commerce. *Communications of the ACM, 46*(4), 91-94.

Sikorsky, D. (2013). Mobile Banking Apps. *A White Paper from New Access*. http://www.newaccess.ch/content/files/New Access Mobile Banking Whitepaper.pdf

Siniscalco, M., & Auriat, N. (2005). *Quantitative research methods in educational planning*. Paris: Unesco.

Standard Bank. (2014). Get #Snappy with SpanScan. Retrieved 1 July 2014, 2014, from http://www.blog.standardbank.com/node/59487

Statistics South Africa. (2011). *Census 2011*. Statistics South Africa Retrieved from http://www.statssa.gov.za/Publications/P03014/P030142011.pdf.

Sulaiman, A., Jaafar, N. I., & Mohezar, S. (2007). An overview of mobile banking adoption among the urban community. *International Journal of Mobile Communications, 5*(2), 157-168.

Suoranta, M., & Mattila, M. (2004). Mobile banking and consumer behaviour: new insights into the diffusion pattern. *Journal of Financial Services Marketing, 8*(4), 354-366.

Tan, M., & Teo, T. (2000). Factors influencing the adoption of internet banking. *Journal of Association for Information Systems, 1*(5), 1-42.

Tashmia, I., & Khumbula, M. (2011). Mobile banking: Innovation for the poor. Maastricht: United Nations University, Economic and social Research and training centre on Innovation and Technology.

Taylor, S., & Todd, P. (1995). Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research, 6*(2), 144-176.

The New Age. (2013). SA's 63 Million Cell Phone Users. Retrieved 25 June, 2013, from http://www.thenewage.co.za/93916-1007-53-SAs_63_million_cell_phone_users

Tiwari, R., Buse, S., & Herstatt, C. (2006). *Mobile banking as business strategy: Impact of mobile technologies on customer behaviour and its implications for banks.* Paper presented at the Technology Management for the Global Future, 2006. PICMET 2006.

Triandis, H. C. (1979). Values, attitudes, and interpersonal behavior. *Nebraska symposium on motivation, 27*, 195 - 259.

Tubbs, B. (2012). South Africans and their cellphones. Retrieved 1 July, 2013, from http://www.itweb.co.za/index.php?option=com_content&view=article&id=57137

Van Biljon, J., & Kotzé, P. (2007). *Modelling the factors that influence mobile phone adoption.* Paper presented at the Proceedings of the 2007 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries.

van der Berg, R. (2014). FlickPay enters mobile payments fray. Retrieved 12 September, 2014, from http://www.techcentral.co.za/flickpay-enters-mobile-payments-fray/49624/

vander Meulen, R., & Rivera, J. (2013). Gartner Says Worldwide Mobile Phone Sales Declined 1.7 Percent in 2012. 1. Retrieved 20 March, 2013, from http://www.gartner.com/newsroom/id/2335616

Vermeulen, J. (2014). Big South African smartphone app battle. Retrieved 15 July, 2014, from http://mybroadband.co.za/news/internet/105969-big-south-african-smartphone-app-battle.html

Virgillito, G., Personal Communication (2013, 2 July 2013). [Head of Banking Apps].

Wang, Y. S., Lin, H. H., & Luarn, P. (2006). Predicting consumer intention to use mobile service. *Information Systems Journal, 16*(2), 157-179.

Warricker, A. (2014). Driving the Adoption of Mobile Payments - What SA Consumers Want. 9. http://tinyurl.com/muaow22

Wiggill, D. (2014, 29 October 2014). Zapper eyes SA smartphone payments crown. Retrieved 29 October 2014, 2014, from http://www.techcentral.co.za/zapper-eyes-sa-smartphone-payments-crown/49448/

Williams, B., Brown, T., & Onsman, A. (2010). Exploratory factor analysis: A five-step guide for novices. *Australasian Journal of Paramedicine, 8*(3).

World Wide Worx. (2012). Mobility 2012. *The Mobile Consumer in South Africa 2012*. http://www.worldwideworx.com/wp-content/uploads/2012/07/Exec-Summary-The-Mobile-Consumer-in-SA-2012.pdf

Wortham, J. (2013, 27 July 2013). I'm Still Waiting for My Phone to Become My Wallet. Retrieved 11 September 2014, 2014, from http://tinyurl.com/kk4rvh3

Yu, F., & Conway, A. (2011). Mobile/smart phone use in higher education.

Zhou, T. (2013). An empirical examination of continuance intention of mobile payment services. *Decision Support Systems, 54*(2), 1085-1091.

Zikmund, W., & Babin, B. (2010). *Exploring marketing research*: Mason: Thomson Higher education.

Zmijewska, A., Lawrence, E., & Steele, R. (2004a). *Towards Understanding of Factors Influencing User Acceptance of Mobile Payment Systems.* Paper presented at the ICWI Proceedings of the IADIS International Conference on WWW/Internet, Madrid.

Zmijewska, A., Lawrence, E., & Steele, R. (2004b). *Towards Understanding of Factors Influencing User Acceptance of Mobile Payment Systems.* Paper presented at the ICWI.

APPENDIX A

University of the Witwatersrand, Johannesburg
Faculty of Commerce, Law and Management

Masters of Business Administration Research Assignment Questionnaire 2014

Please be assured that responses will be treated with the utmost confidentiality and anonymity.

Good Day,

My name is Garth Balabanoff; I am a Master of Business Administration (MBA) student at Wits Business School. This questionnaire will help us improve and understand consumer behaviour, acceptance and adoption strategies for mobile payment services in South Africa

You are invited to participate in this questionnaire. Your participation is entirely voluntary and involves no risk, penalty or loss of benefits whether or not you participate. You are also able to withdraw at any stage. This questionnaire should take you approximately **5 minutes** to complete. May I request that this is done as accurately as possible.

There are no correct or incorrect answers. For each statement, **tick (✓)** the number which best describes your experience.

Please note that all answers are strictly private and confidential and are not accessible in the public domain ensuring anonymity and confidentiality. Once questionnaire data has been captured and analyzed all questionnaires will be shredded and disposed of after a period of 5 years.

In the interest of clarity, a mobile payment is where one can use a mobile device, as a payment device ie a payment terminal. Alternatively, a mobile payment is when a user uses a mobile phone to conduct payment for bills, goods and / or services. Having said this, mobile payment services can therefore be defined as the service that facilitates payment functionality.

Thank you for your participation.

Garth Andrew Balabanoff
Masters of Business Administration Student
Email: garthbal@live.co.za

Laurence Beder
MBA Supervisor
Email: bederjhb@mweb.co.za

PLEASE TURN OVER PAGE

Section A: Please mark a tick **(✓)** next to your answers.

1. What is your age?

_____

2. What is your gender?

	Male
	Female

3. Do you own a smart phone?

	Yes
	No

4. Which make of cell phone do you use?

_____

5. Do you have a bank account?

	Yes
	No

6. Have you heard about mobile payment services?

	Yes
	No

7. Have you ever used a mobile payment service? Such as, SnapScan, FlickPay, Zapper, Payment Pebble, NFC (Near Field Communication) or SMS.

	Yes
	No

8. If you answered yes to the above, please state which mobile service you used

_____

PLEASE TURN OVER PAGE

Section B: Please mark a tick **(✓)** next to your answers.

	1 Strongly Disagree ⟶ 7 Strongly Agree							
1	Using mobile payment services would save time	1	2	3	4	5	6	7
2	Using mobile payment services is important to me	1	2	3	4	5	6	7
3	A mobile payment service is more advantageous than conventional form of transacting	1	2	3	4	5	6	7
4	A mobile payment service will be more advantageous towards making transactions more convenient rather than traditional forms of transacting (using a credit card or cash)	1	2	3	4	5	6	7
5	I believe that mobile payment services would be easy to use	1	2	3	4	5	6	7
6	I would be satisfied if there was evidence that the security provided by the vendors mobile payment service is secure	1	2	3	4	5	6	7
7	I feel that mobile payment services is a risky mode of transacting to use	1	2	3	4	5	6	7
8	I would want to feel confident that my privacy requirements would be secure when transacting through a mobile payment service	1	2	3	4	5	6	7
9	I would want to feel confident that my personal information would not be at risk when transacting through a mobile payment service	1	2	3	4	5	6	7
10	I would want to feel confident that my transactions would not be at risk when using a mobile payment service	1	2	3	4	5	6	7
11	I believe I could easily operate a mobile payment service	1	2	3	4	5	6	7
12	I believe I have the ability to be able to transact through the vendors mobile payment service	1	2	3	4	5	6	7
13	I would feel confident in my ability to use a mobile payment service	1	2	3	4	5	6	7
14	I would feel comfortable using a mobile payment service	1	2	3	4	5	6	7
15	I believe I am confident enough to trust that transacting through a mobile payment service would be safe and secure	1	2	3	4	5	6	7
16	I would be less likely to use a mobile payment service if the cellular network broadband infrastructure and facilities such as bandwidth, was slow and **interfered with the speed of transactions**	1	2	3	4	5	6	7
17	I would be less likely to use a mobile payment service if the cellular network broadband infrastructure and facilities such as bandwidth, **hampered navigation**	1	2	3	4	5	6	7
18	I believe that a mobile payment service is less onerous than traditional forms of transacting	1	2	3	4	5	6	7
19	I would be less likely to use a mobile payment service if the mobile payment service transaction was not guaranteed of being perfectly concluded.	1	2	3	4	5	6	7
20	I would be less likely to use a mobile payment service if there was no support provided by the vendor for such a service	1	2	3	4	5	6	7
21	I would utilize a mobile payment service if my friends/family used such a facility	1	2	3	4	5	6	7
22	I believe that using a mobile payment service would improve my social status	1	2	3	4	5	6	7
23	People my age are expected to be using a mobile banking payment applications	1	2	3	4	5	6	7
24	If a mobile payment service met my transacting needs I would become an advocate of such an application	1	2	3	4	5	6	7
25	The people whose opinions I value would approve of me using a mobile payment service to make purchases	1	2	3	4	5	6	7
26	I see true benefit in mobile payment services	1	2	3	4	5	6	7
27	I believe mobile payment services would work well within my current lifestyle	1	2	3	4	5	6	7
28	I would use a mobile payment service if there were associated benefits and added value.	1	2	3	4	5	6	7
29	I would adopt a mobile payment service if this facility was free of charge	1	2	3	4	5	6	7
30	I intend to use a mobile payment system to make purchases	1	2	3	4	5	6	7

Thank you for your time and patience in completing this questionnaire. Your input is highly appreciated.