University of Fort Hare
Together in Excellence

MOBILE PHONE BANKING: A COMPARATIVE ANALYSIS OF E-SERVICE QUALITY AND CUSTOMER LOYALTY

DARLINGTON TAWANDA CHIGORI

201516272

A dissertation submitted in the requirements of the degree

MASTER OF COMMERCE (BUSINESS MANAGEMENT)

in the

Department of Business Management

Faculty of Management and Commerce at the University of Fort Hare

Supervisor: Dr. Kim Viljoen
Co-Supervisor: Ms. Mari Ford

June 2017

ABSTRACT

Mobile phone banking optimisation around the world is becoming more significant. Banks are investing heavily to improve service quality of both mobile phone banking applications and Unstructured Supplementary Service Data (USSD) banking in a bid to retain existing customers and win new ones. The majority of studies focusing on mobile phone banking have related to adoption and the validation of theories and factors affecting mobile phone banking. This study focused on contrasting the two categories of mobile phone banking, specifically mobile banking applications and USSD banking. This comparison is drawn in terms of e-service quality of these modes of banking and their resultant effects on customer loyalty. To validate and determine the nature of the relationships in the proposed model, the study examined e-service quality in terms of efficiency, fulfilment, privacy and systems availability as well as the overall influence of service quality on customer loyalty with respect to the two types of mobile banking.

The positivistic paradigm was employed and thus, due to the scope of data and nature of the study, the quantitative approach was considered as the most appropriate approach. Previously used reliable and valid scales were adapted through a self-administered survey questionnaire. The results from a total number of 218 students at the University of Fort Hare (UFH) were analysed through Pearson correlation analysis, multiple regression analysis and Smart Partial Least Squares structural equation models (PLS-SEM).

Based on the findings, various recommendations and implications were suggested to banks, practitioners and academics. The findings indicated that fulfilment, privacy and efficiency were all significantly related to overall service quality and customer loyalty. Systems availability was not significantly related to overall service quality and customer loyalty. The findings showed that privacy, fulfilment and efficiency are critical to both mobile banking applications (MB App) and USSD/cellphone banking.

DECLARATIONS

Declaration

I, Darlington Tawanda Chigori, student number 201516272 declare that the dissertation that I hereby submit for the Master's degree in Business Management at the University of Fort Hare is my work and has not been prior submitted by me for degree purposes at another university.

Signature…………………………

Date……12…/…06…/…2017…..

Declaration on Plagiarism

I, Darlington Tawanda Chigori, student number 201516272, hereby declare that I am fully aware of the University of Fort Hare's policy on plagiarism and I have taken precautions to comply with the regulations.

Signature……………………..

Date………12……/…06…/….2017…

Declarations on Research Ethics

I, Darlington Tawanda Chigori, student number 201516272, hereby declare that I am fully aware of the University of Fort Hare's policy on research ethics and have taken precautions to comply with the regulations. I have obtained an ethical clearance certificate at the University of Fort Hare Research Ethics Committee (UREC) so as to comply.

Signature…………………….

Date……12………/…06…/…..2017...

Language Editing Declaration

I hereby confirm that I have proofread and edited the following master's thesis using the Windows "Tracking" system to reflect my comments and suggested corrections for the student to act on: Mobile phone banking: A comparative analysis of e-service quality and customer loyalty, by Darlington Tawanda Chigori, a master's thesis submitted in fulfilment of the requirements for the degree of Master of Commerce (Business Management) at the University of Fort Hare.

Lauren Wainwright

Language Editor

ACKNOWLEDGEMENTS

I would like to express boundless gratitude to my supervisors Dr K. Viljoen and Ms M. Ford for their unwavering guidance and support throughout the research process. Their experience, advice and knowledge were irreplaceable to the completion of this thesis. I would also like to thank the University of Fort Hare's librarians for their guidance throughout the study period. Extended gratitude goes to my family for their support, endurance and perpetual encouragement through my studies. I am also thankful for the life and knowledge that God has granted me to be courageous through my study period.

DEDICATION

I dedicate this special moment to Nosipho Gaju for her encouragement in moments I had lost all hope that she was always there to support me.

TABLE OF CONTENTS

IX

X

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ABSA	**Amalgamated Banks of South Africa**
BASA	**Banking Association of South Africa**
CA	**Cronbach's Alpha**
CFA	**Confirmatory Factor Analysis**
EFA	**Exploratory Factor Analysis**
FNB	**First National Bank**
ICT	**Information Communication Technology**
IT	**Information Technology**
MB App	**Mobile Banking Application**
PLS	**Partial Least Squares**
PLS-SEM	**Partial Least Squares-Structural Equation Modelling**
SA	**South Africa**
SEM	**Structural Equation Modelling**
SPSS	**Statistical Package for Social Sciences**
SQ	**Service Quality**
UFH	**University of Fort Hare**
USSD	**Unstructured Supplementary Service Data**

CHAPTER 1: INTRODUCTION AND BACKGROUND OF STUDY

1.1 INTRODUCTION AND BACKGROUND

The demands of modern lifestyles have an impact on the amount of time consumers have to conduct routine activities (Purwanegara, Apriningsih, & Andika, 2014). As a result, more people are using their mobile phones to complete daily activities, one of which is banking. In the past, mobile phones were considered a luxury, but recent years have shown a growing number of mobile phone users globally especially amongst the younger generation (George, Stryjak, Meloán, & Castells, 2015; Ngai & Gunasekaran, 2007). Consumers have now accepted mobile phones as a necessity in order to access information from anywhere at any time (Hodgkinson, 2015).

Traditionally, desktops and personal computers have been the principal way to access the internet to conduct e-commerce, e-banking and other online activities. However, rapid developments in mobile phone technology have led to more and more people using their mobile phones for these activities (Bosomworth, 2015; Dobush, 2015). The introduction of superior network services, memory capacity and advanced processing speed in mobile phone devices has allowed consumers to move from traditional Internet banking to mobile phone banking (Peevers, Douglas, & Jack, 2008). Mobile phone banking refers to gaining remote access to financial and banking services on mobile phones by means of Wi-Fi, superior 3G and 4G networks offering self-service to customers (Tiwari, Buse, & Herstatt, 2007). In South Africa (SA), the highest mobile penetrations in the world have been recorded with 87% individual mobile phone ownership with 36% of those being smartphones (Meyer, 2015).

In a bid to retain customers, the major SA banks have directed their efforts to the improvement of SQ and leading to banks now offering mobile phone banking via applications and USSD banking (Honigman, 2014; Shambare, 2011). Mobile phone banking applications consist of software designed to connect to the bank remotely (Alsoufi & Ali, 2014; Technopedia, 2016). These applications allow customers to conduct a range of activities which include checking balances and statements, buying prepaid airtime and electricity, making payments, transferring money between accounts, and sending and receiving money using mobile phone numbers.

Unstructured Supplementary Service Data (USSD) banking is a series of numeric codes that drives a simple menu system for users to connect without using the Internet. It is used for checking sim card airtime balances, airtime and transfers as well as in mobile banking to conduct transactions, check balances and statements, transfers, investments, and receive notifications (Bizcommunity, 2016; Gordon, 2013).

1.2 RESEARCH PROBLEM AND OBJECTIVES

The problem statement and study objectives enabled the researcher to formulate the hypotheses which were tested in this study.

1.2.1 Problem Statement

Mobile phone banking optimisation around the world is becoming more significant with numerous banks investing heavily to improve service quality (SQ) of both mobile phone banking applications and USSD banking in a bid to retain existing customers and win new ones. The majority of studies focusing on mobile phone banking have related to adoption, validation of theories and factors affecting mobile phone banking (Duff, 2014; Effective Measure, 2014; Ondiege, 2010; Porteous, 2006; Van Velden, Roopnarain, Kana, & Nitish, 2015; Wilson, 1999). Because the concept of mobile phone banking in SA is still developing, consumers may have SQ concerns which may lead to them not adopting this type of banking (Shanka, 2012).

Further, continuous innovation in technology, applications and databases yields concerns for SQ in mobile phone banking which can have implications on customers' long-term loyalty (Halliburton & Poenaru, 2010). In the original sense, SQ refers to "the quality of all non-internet based customer interactions and experiences with companies" (Parasuraman, Zeithaml,& Malhotra, 2005, p. 2). With innovation in technology, traditional SQ has enabled conceptualisation and measuring of electronic service quality.

E-service quality refers to the "extent to which a website facilitates efficient and effective shopping, purchasing, and delivery" (Parasuraman *et al*., 2005, p.5). Understanding customers and which offerings lead to greater customer loyalty is an important aspect

for businesses and marketers alike. Little is known about which mode of banking delivers higher levels of customer service and loyalty. This study, therefore, compared the e-service quality levels of mobile phone banking applications versus USSD banking services and in turn determined their effects on customer loyalty. This helped bridge the marketing knowledge gap that currently exists in mobile phone banking literature.

1.2.2 Primary and Secondary Objectives

The major aim of this study was to compare the effect of overall service quality of USSD banking versus mobile phone banking applications in relation to customer loyalty.

1.2.2.1 Secondary objectives

➢ To compare the efficiency of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
➢ To compare the fulfilment of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
➢ To compare the privacy of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
➢ To compare the system availability of USSD banking and mobile phone banking applications in relation to perceived overall service quality.

1.2.2.2 Models and Hypotheses

Figures 1.1 and 1.2 present the hypotheses and ten propositions for the study which were tested through PLS-SEM structural equation modelling. The hypotheses are divided into two models: one for USSD/cellphone banking and the other for MB apps. The following section presents the two proposed models and hypotheses.
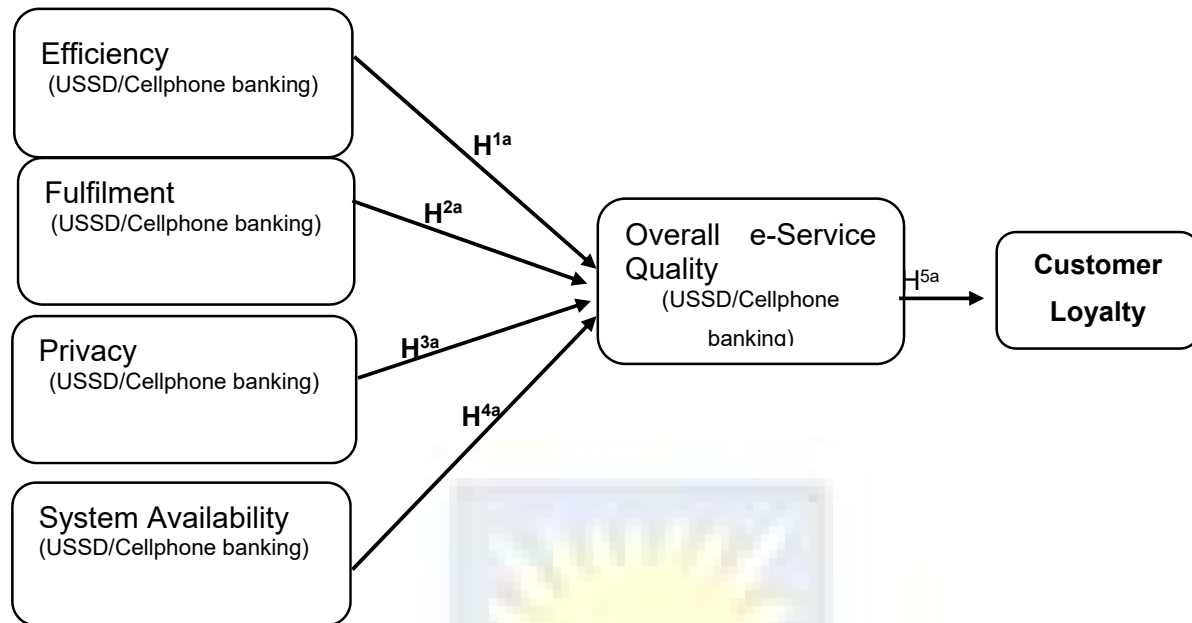
Figure 1.1: Presentation of hypotheses for USSD/cellphone banking

H^{1a0} *The efficiency of USSD banking does not have a significantly positive influence on overall service quality of USSD banking.*

H^{1a} *The efficiency of USSD banking has a significantly positive influence on overall service quality of USSD banking.*

H^{2a0} *The fulfilment of USSD banking does not have a significantly positive influence on service quality of USSD banking.*

H^{2a} *The fulfilment of USSD banking has a significantly positive influence on service quality of USSD banking.*

H^{3a0} *Privacy of USSD banking does not have a significantly positive influence on service quality of USSD banking.*

H^{3a} *Privacy of USSD banking has a significantly positive influence on service quality of USSD banking.*

H^{4a0} *System availability of USSD banking does not have a significantly positive influence on service quality of USSD banking.*

H^{4a} *System availability of USSD banking has a significantly positive influence on service quality of USSD banking.*

H⁵ᵃ⁰   *Perceived overall e-service quality of USSD banking does not have a significantly positive influence on customer loyalty.*

H⁵ᵃ   *Perceived overall e-service quality of USSD banking has a significantly positive influence on customer loyalty.*

1.2.2.2.2 Model of MB apps and hypotheses
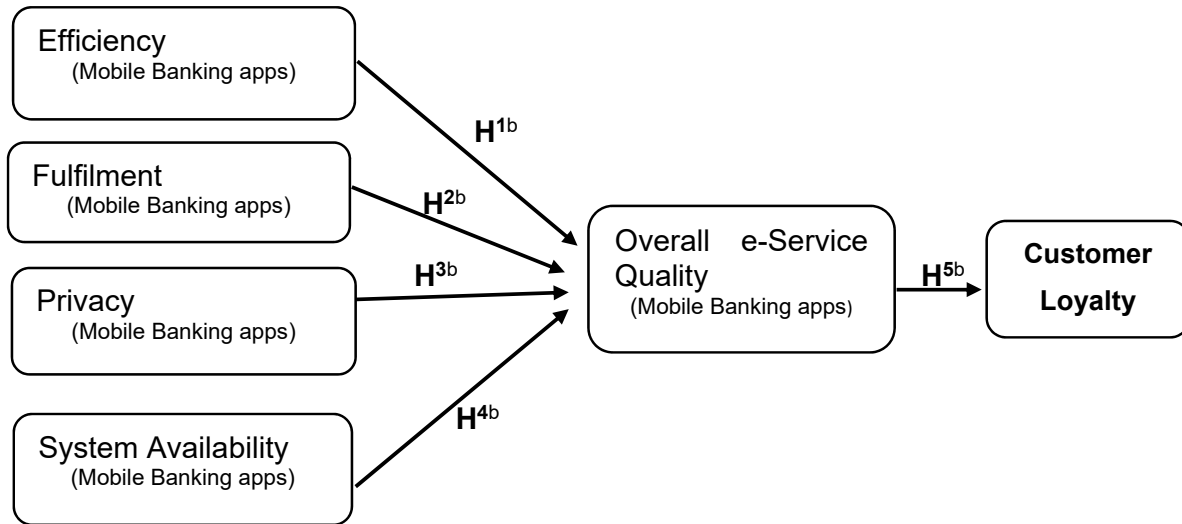
Figure 1.2: Presentation of hypotheses for MB apps

H¹ᵇ⁰   *The efficiency of mobile phone banking applications does not have a significantly positive influence on overall service quality of banking apps.*

H¹ᵇ   *The efficiency of mobile phone banking applications has a significantly positive influence on overall service quality of mobile phone banking apps.*

H²ᵇ⁰   *The fulfilment of mobile phone banking applications does not have a significantly positive influence on service quality of mobile phone banking apps.*

H²ᵇ   *The fulfilment of mobile phone banking applications has a significantly positive influence on service quality of mobile phone banking apps.*

H³ᵇ⁰   *Privacy of mobile phone banking applications does not have a significantly positive influence on service quality of mobile phone banking apps.*

H³ᵇ   *Privacy of mobile phone banking applications has a significantly positive influence on service quality of mobile phone banking apps.*

H⁴ᵇ⁰   *System availability of mobile phone banking applications does not have a significantly positive influence on service quality of mobile phone banking apps.*

H^{4b}   *System availability of mobile phone banking applications has a significantly positive influence on service quality of mobile phone banking apps.*

H^{5b0}   *Perceived overall e-service quality of mobile phone banking applications does not have a significantly positive influence on customer loyalty.*

H^{5b}   *Perceived overall e-service quality of mobile phone banking applications has a significantly positive influence on customer loyalty.*

1.4 PRELIMINARY LITERATURE REVIEW

The succeeding sections outline the theoretical framework of the study and discuss the key constructs in the models to be tested.

1.4.1 Theoretical Framework

Theoretically, the multi-aspect approach embedded in SQ describes how customers evaluate their consumption experiences. SQ refers to "the quality of all non-internet based customer interactions and experiences with companies"(Parasuraman *et al*., 2005, p. 2). According to Parasuraman *et al*. (2005), e-service quality is described as the "extent to which a website facilitates efficient and effective shopping, purchasing, and delivery" (p. 5). Thus SQ can be used as a basis for comparison of what customers feel about the company's actual service performance.

1.4.1.1 SERVQUAL

SQ has been widely used as a measurement tool in multiple disciplines (Agbor, 2011; Ayo, Oni, Adewoye, & Eweoya, 2016; Blut, Chowdhry, Mittal, & Brock, 2015; Kim & Nitecki, 2014) and it is well known for its adaptability to various service sectors. It originates from a link between what customers feel and expect the company to offer in relation to what is currently offered. SQ has been known to be adaptable to non-Internet based studies in which it has been applied to marketing, traditional banking, and other different sectors.

The majority of these studies have been conducted worldwide in marketing, banking, e-commerce and online social networks (Afshan & Sharif, 2016; Hanafizadeh *et al*., 2014).

6

A number of studies have concentrated on the adoption of mobile phone banking and factors influencing the use and adoption of mobile phone banking (Kazemi, Nilipour, Kabiry, & Hoseini, 2013; Shaikh & Karjaluoto, 2014). Other researchers have also focused on the importance of trust in mobile phone banking in general.

From an SA perspective, few studies in relation to mobile phone banking have been conducted. However, these studies have validated mobile phone banking in an SA context as a new growing banking platform (Duff, 2014; Ondiege, 2010; Porteous, 2006a; Shambare, 2011; Van Velden *et al*., 2015; Wilson, 1999).

1.4.1.2 E-SERVQUAL

Although the service quality framework SERVQUAL was ideal for evaluating consumption experiences in traditional non-Internet based and non-electronic products, the innovation in technology has led to an easier assessment of customers' feelings through e-service quality (E-S-QUAL). It can be noted that e-services differ from traditional services in that customers relate to the company through an electronic site or application (Parasuraman *et al*., 2005; Wahab *et al*., 2011). E-S-QUAL is presented as a 22-item scale of four dimensions which are: fulfilment (the degree to which the site guarantees completion of order or transaction); efficiency (speed and ease of using and accessing a site); privacy (how safe a site is and safeguards consumer information), and system availability (technical functioning of the site) (Kim & Nitecki, 2014). It was developed to measure customers' perceptions of SQ online, and it has been applied to numerous studies over the years *(*Ayo *et al.,* 2016*;* Kim & Nitecki, 2014*;* Parasuraman *et al*., 2005; Rafiq, Lu, & Fulford, 2012; Tsourela, 2014; Zehir, Sehitoglu, Narcikara, & Zehir, 2014). .

1.4.1.2.1 Fulfilment

According to Parasuraman *et al*. (2005), fulfilment refers to the degree to which the site's assurances about commands or directives provision and item accessibility are fulfilled. This construct encompasses precise commands and product representation. Since the construct was modified from original SQ constructs by Parasuraman *et al*. (2005), the

meaning was marginally reviewed to the point to which it presented dependable and accurate information for assessing e-service quality (Kim & Nitecki, 2014).

1.4.1.2.2 Efficiency

Efficiency is defined as the simplicity and quickness of getting into (application, website) and using the service (Parasuraman *et al*., 2005). It is considered significant in e-commerce since time-saving and accessibility are primarily considered key reasons for using e-services (Kim, Kim, & Lennon, 2006; Wahab *et al*., 2011). The construct was adapted to reflect the degree to which a platform is easy to use when performing a transaction.

1.4.1.2.3 Systems availability

Systems availability relates to the accurate technical functioning of the site (Kim, 2015; Parasuraman *et al*., 2005; Tsourela, 2014). When consumers are online or browsing the site, problems relating to functioning, like missing links or non-working buttons, dissatisfy customers and increase the possibility of exiting (Ahuja, Gupta, & Raman, 2003). The company may, therefore, lose the opportunity to increase customer loyalty.

1.4.1.2.4 Privacy

Parasuraman *et al*. (2005) define privacy as the extent to which the site guarantees to safeguard and protect customer information. Several customers are reluctant to purchase products and make transactions from both the Internet and their electronic devices due to the risk associated with the use of technology and misuse of customer information (Santouridis, Trivellas, & Georgios, 2012). Service providers are now aware and used to the significance of providing consumer privacy. It has previously been discovered that privacy has a strong effect on customer loyalty in terms of cell phone usage (Wahab *et al*., 2011).

1.4.1.2.5 Customer loyalty

Customer loyalty is described as a profoundly held obligation to repurchase services and products continuously, notwithstanding circumstantial influences or marketing determination which has potential to source switching behaviour (Aldas-Manzano, Ruiz-Mafe, Sanz-Blas, & Lassala-Navarré, 2011). Customer loyalty is important because it fortifies the brand image and the organisation's goodwill. Loyal customers are essential for every enterprise as they contribute considerably to profitability (Wahab *et al*., 2011).

Literature supports the fact that SQ leads to customer loyalty which thus extends the buyer-seller relationship (Ariff, Yun, Zakuan, & Ismail, 2013; Shanka, 2012; Zehir et al., 2014). Pressure to retain customers manifests from different sources such as cost-effectiveness and declining performance among others (Frenz & Ietto-Gillies, 2009). In mobile phone banking, the need to keep USSD banking and banking applications up to date and competitive is key to building customer loyalty.

1.3 SIGNIFICANCE OF THE STUDY

Innovation in technology is leading banking and financial institutions to consider different methods of improving SQ and building loyalty in order to obtain or maintain a competitive advantage (Oppong, Adjei, & Poku, 2014). Though it is understood that mobile phone banking is making a huge impact on the overall African economy, several banks in SA are still in the developmental stages with regards to this technology (EffectiveMeasure, 2014; Hodgkinson, 2015; Ondiege, 2010; Porteous, 2006).

Banks and financial institutions have so far been able to establish websites and design applications to accommodate different customers' needs. According to Hanafizadeh, Behboudi, Abedini, and Jalilvand (2014), the usage of mobile phones in banking is believed to reinforce the bond between financial services providers and customers. This study, therefore, sought to show a comparison between USSD banking and mobile phone banking applications in the South African context.

1.5 RESEARCH METHODOLOGY

Research methodology is a continuous predetermined course of action that the researcher adheres to while conducting research (Dane, 2010; Mangal & Mangal, 2013; Panneerselvam, 2014; Singh, 2012). Methodology generally comprises the research paradigm, design, approach, population, sampling strategy and data collection method.

1.5.1 Research Paradigm and Design

Research paradigms are a group of beliefs that influence the way of conducting research and what should be studied. Paradigms enable researchers to relate the occurrence of activities naturally without the interference of human beings (Friedlander, Pieterse, & Lambert, 2012). According to Dudovskiy (2016), the positivist paradigm is interpreted in diverse ways subject to how it is utilised. Its role and objective in this study were to limit the researcher to the interpretation of collected data through an objective approach, of which the findings of the research should be quantifiable and observable. The study utilised the positivist paradigm due to the requirements to independently and systematically categorise the variables under study. Owing to the positivist paradigm, an associated descriptive design and thus a quantitative research approach was used in the study. The research design and approach served as a blueprint to collect, measure and analyse data (Sekaran & Bougie, 2013). The following section will briefly explain the population and the sampling frame.

1.5.2 Population and Sampling

Sampling refers to a representative group of subjects. It is unmanageable and impractical to collect data from all people who are targets of one's study (Creswell, 2014; Dudovskiy, 2016; Flick, 2015; Panneerselvam, 2014). Non-probability sampling was adopted in this study in the form of convenience sampling, and the sampling population comprised of student mobile phone banking users. As supported by the literature, students were selected as the sample as they are a technologically savvy generation and use mobile phones far more than other age groups (Govender & Sihlali, 2014; Margaryan, Littlejohn, & Vojt, 2011; Mlitwa & Tshetsha, 2012).

In order to meet the requirements of the sample size to effect use of the structural equation modelling (SEM), a sample of no less than 200 students was used (Boomsma & Hoogland, 2001; Hair, Ringle, & Sarstedt, 2013; Wong, 2013). Furthermore, to ensure that the exact target population was reached, qualifying questions regarding mobile phone banking were also used. The qualifying questions enabled the researcher to distinguish between the users of USSD/cellphone banking and banking applications. It also increased the chances of targeting the right sample while collecting data. Moreover, the usage of qualifying questions aided in facilitating the comparison between USSD and banking apps.

1.5.3 Research Instrument

Research instruments are defined as tools or mediums considered when gathering and measuring data on survey questionnaires, structured interview schedules and checklists. This research utilised a structured questionnaire to collect information. Previously reliable and valid scales utilised by authors such as Aldas-Manzano *et al*. (2011); Parasuraman *et al*. (2005); Yang and Feng-Shii Tsai (2007), and Zeithaml, Berry, and Parasuraman (1996) were adapted. The adapted scales included customer loyalty, fulfilment, efficiency, systems availability and privacy. These were adopted specifically for their consistency in relation to other scales used in other studies. Respondents were expected to assess their responses in English using self-administered questionnaires containing five-point Likert scales. The constructs and associated measurements utilised in this research project were adapted from numerous empirical studies as shown in the following section.

1.5.4 Data Collection Method

In quantitative research, typical data gathering processes include surveys, experiments and observations (Kumar, 2014). As previously indicated, this study used a survey in the form of self-administered questionnaires. According to Fink (2013), "surveys are data collection methods used to describe, compare, or explain individual and societal knowledge, feelings, values, preferences and behaviour" (p. 7). The use of surveys is advantageous because they are easy to develop, especially when using advanced survey software solutions. Surveys also pose a greater advantage because they are

cost-effective, easy to administer and save time (Kumar, 2014; Malhotra, 1999). This helped to shorten the period over which the study was conducted.

1.5.5 Data Analysis

Quantitative research makes use of statistics to analyse and interpret data. Data analysis is described as reviewing, learning and evaluating tabulated information to translate it into meaningful, easy to understand information (Singh, 2012). In the current study, primary data was collected through a questionnaire and captured on Microsoft Excel. The investigator used the Statistical Package for Social Sciences (SPSS), Smart PLS and Lisrel for the SEM component of the data analysis. These programmes were used for testing reliability, confirmatory factor analysis, and an advanced multivariate analysis through PLS-SEM. Once the data was fully captured, it was cleaned and the missing values were managed and transferred onto SPSS. The descriptive statistics and inferential statistics followed thereafter.

Descriptive analysis refers to the statistical procedures used to define the sample being studied. Therefore from the current study, descriptive statistics including measures of central tendency (averages, ranges, modes and frequency distributions) were analysed from data collected from the ordinal scales. The inferential statistics undertaken included Pearson's correlation, regression analysis and a version of SEM called partial least squares (PLS-SEM).

Pearson correlation was used to determine the direction of linear relationships between the independent (*fulfilment, efficiency, systems availability and privacy*) and dependant variables (*overall service quality*) as well as their influence on customer loyalty. The correlation values are usually between +1 and -1, where a positive correlation shows a perfect direct relationship, zero shows no relationship, and a negative correlation shows a perfect inverse relationship (McDaniel & Gates, 2013, p.526). Multiple regression assesses the relationship between dependent variables and two or more independent variables (Wiid & Diggines, 2015). In the current study, multiple regression was used to evaluate the model in terms of predictive ability by examining the coefficient of determination (R^2). R^2 is generated as a number between 0 and 1. The closer R^2 is to 1, the better the model is at predicting the relationship.

It is also well known that factor analysis, path analysis and regression represent the types of statistical analysis conducted through SEM. Therefore, SEM was further used to test the validity of the instrument, test hypotheses and interrelationships, as well as validating the research models. The two models were analysed and presented in Chapter Five. The advantage of SEM is that it enables the investigator to test all interrelationships at once. This enabled the researcher to discover direct and indirect paths among the variables tested (Iacobucci & Churchill, 2010). The present study used the soft modelling approach to SEM which involves partial least squares (SEM-PLS approach). Since the structural model estimation was performed via PLS using Smart PLS, in order to accept hypotheses, a 5% level of significance value of 1.96 t-statistics is required (Hair *et al*., 2013; Wong, 2013). Reliability and validity analysis are discussed in the following section.

1.5.5.1 Reliability and validity

Validity refers to the degree whereby the measuring instrument measures what it claims to measure (Dudovskiy, 2016; Jonker & Pennink, 2010). Collis and Hussey (2013) state that "errors such as faulty research procedures, poor samples, and inaccurate or misleading measurement, can undermine validity" (p. 53). The validity of an instrument is assessed through factor analysis. Factor analysis is a statistical procedure denoting a class of procedures used for data reduction and summarisation (Malhotra, 1999). McDaniel and Gates (2013) cite that factor analysis is a procedure for a smaller set of factors or composite variables by identifying underlying dimensions of the data. Several suggestions have been passed in relation to minimum required (cut-off points) factor loadings. Factor loadings indicate the correlation between scores and original variables (Wiid & Diggines, 2015). The present study applied the proposition of Hair, Anderson, and Tatham (1998) as well as Stevens (2002) who stated that a minimum factor loading of 0.40 is required for a sample size of 200 and for interpretive purposes respectively. It is impossible to explain or authenticate either validity or reliability without the other (Malhotra, 1999).

Reliability is the extent to which test scores are consistent or stable (Dudovskiy, 2016). The researcher tested reliability using Cronbach's alpha. A measuring instrument is

considered reliable when it is applied multiple times and consistently yields the same results (Creswell, 2014). The reliability of an instrument is shown by the reliability coefficient. The Cronbach's alpha (CA) is often denoted as '*r*' and is articulated as a numeral value ranging between 0 and 1.00, with '*r*= 0 representing no reliability, and '*r*= 1.00 signifying perfect reliability (Mangal & Mangal, 2013). The higher the reliability coefficient the more consistent the instrument. The reliability coefficient value of 0.900 and up can be interpreted as an excellent score. The range of CA coefficients of 0.800 and 0.890 as well as 0.700 and 0.790 are respectively regarded as good and adequate for indication of consistency. Although values below 0.700 are accepted, they will have limited applicability. The following section will discuss ethical considerations of the study in part. A fuller description will follow in Chapter Four.

1.5.6 Ethical Considerations

According to Kumar (2014), ethics deals with beliefs about what is right or wrong. Much emphasis has been placed on ethics in research in recent years. Notably, there is more to ethics than definitions about a moral conduct of right and wrong. Therefore, the researcher is required to adhere to a code of ethics which states that: subjects should be allowed to refuse to take part in the research; demonstrate confidentiality through a non-disclosure agreement signed by the researcher to keep details of respondents private; ensure that anonymity is maintained by allowing respondents not to provide their names while completing a questionnaire; be open and honest to respondents, and use appropriate data collection techniques (Kumar, 2014). An ethical clearance certificate was obtained for this study from the University Research Ethics Committee (UREC) at the University of Fort Hare (UFH).

1.6 DELIMITATIONS

Narrowing the scope of the study enables the researcher to identify the boundaries of the study in terms of subjects, time frame, facilities and objectives. The delimitations of this study are as follows:

➢ The researcher used university students as the sample.
➢ The study was only confined to the East London, Bhisho and Alice areas where the UFH students are located.

> ➤ The study only considered two types of mobile banking that are currently being used in SA.

1.7 STRUCTURE OF THE THESIS

As indicated in Table 1.1, the thesis consists of six chapters. The first chapter incorporates an introduction to the problem and objectives of the study as well as a broad overview of the study. Chapters Two and Three provide the theoretical and empirical underpinning of the study, while Chapter Four outlines the research methodology employed. Chapter Five provides the findings of the study, and Chapter Six comprises recommendations and final conclusions for the thesis.

Table 1.1: Structure of thesis

CHAPTER	SECTION
Chapter 1	Introduction and Background of Study
Chapter 2	Technological adoption in the South African Banking Industry
Chapter 3	Development of the Conceptual Models
Chapter 4	Research Methodology
Chapter 5	Data Analysis and Findings
Chapter 6	Recommendations and conclusions

1.8 SUMMARY AND CONCLUSION

This chapter discussed the background of the study, the research problem, the objectives and the significance of the study, as well as the preliminary literature review, research methodology and structure of the thesis. The subsequent chapter contains the literature review regarding technological adoption in South Africa's banking industry as well as the service industry.

CHAPTER 2: TECHNOLOGICAL ADOPTION IN SOUTH AFRICA'S BANKING INDUSTRY

2.1 INTRODUCTION

Chapter One discussed and introduced the study's focus on mobile phone banking, an investigation of e-service quality and customer loyalty. It further provided the background of the study which led to the theoretical framework of the study, as well as a brief overview of the literature and the methodology employed.

As part of the literature review, Chapter Two will provide an overview of the banking industry and technology utilised in the industry. The chapter will discuss issues around banking and how the industry has advanced in terms of technology compared to previous years. Furthermore, the modes of banking under investigation will be discussed, and the chapter commences with building the context for the banking industry which is regarded as an important element of the SA services industry.

2.2 THE IMPORTANCE OF THE SERVICES INDUSTRY

In the past decades, it has been noticed that, in reaction to the growth in the service industry, cumulative interests in what has been termed services and innovation have grown (Paton & McLaughlin, 2008). This developed research field has been promoted by extremely keen-sighted enterprises, government agencies and academics (Paton & McLaughlin, 2008; Turner, 2009). Services embody a multi-disciplinary approach: science, marketing, engineering, health and management (Paton & McLaughlin, 2008). The possible driving force of the services sector is services innovation, dealing less with the final product but rather with the support, development and delivery of services (Morrar, 2014).

The perpetual growth of services is so extensive that some services used daily have become so routine that they are barely noticed (Berry & Parasuraman, 1992). Services are defined as a series of activities of an intangible nature, which are necessarily valuable action, deed or effort performed to satisfy a need or fulfil a demand (Grönroos, 2001). Several service products have shown tremendous impact and demand in most

economies (Das & Raut, 2014; Heskett, 1987). The dominance of the service sector has been witnessed in most industrialised countries. This sector has shown a considerable contribution to economic development. More importantly, the service sector offers opportunities to stay competitive to both businesses and entrepreneurs in SA (Lovelock & Wirtz, 2011). In South Africa, the services sector has been the sole contributor to national revenues contributing approximately 70% (Boshoff, 2014).

According to Lovelock and Wirtz (2011), different factors aid in the transformation of services and their delivery. Among these factors are government policies, social changes business trends, advances in technology and globalisation. Though most of these factors have brought a considerable change, information technology (IT) has been at the forefront of it all (Boshoff, 2014; Das & Raut, 2014; Lovelock & Wirtz, 2011). IT has seen several businesses increasing their usage of Internet, adopting mobile technology in service provision as well as wireless networking; development of faster software, and digitalisation of text, graphics, audio and video (Lovelock & Wirtz, 2011). This has been an advantage to several business sectors as they try to make the most of this development, but it also presents a number of challenges.

With so many businesses moving from being capital intensive to service dominated, this has led to retrenchment and reduction in companies being labour intensive (Zhao, Zhou, & Huesig, 2010). Businesses and public sector organisations are under pressure to reduce costs and downsize resources to remain profitable or operate within their budgets (Morrar, 2014). One way most businesses have attained this has been through turning to service based products delivered through technology. This has led to different sets of issues as customers sometimes find it hard to evaluate the difference between one service and another (Porter, 1990). This has also led to the increase in types of services of which the financial and banking services are dominating industries (Mallat, Rossi, & Tuunainen, 2004).The banking sector is one area that has been highly service intensive (Boshoff, 2014), and will be discussed in the following section.

2.3 THE BANKING INDUSTRY IN SA

SA hosts one of the world's most efficient financial market rankings, that is number 12 in the world, and thus benefits from a sound market structure (World Economic Forum, 2016). Linked to the financial market is the banking industry ranked third out of 148 countries (BASA, 2014). From 2002, the total number of registered banks in South Africa ranges between 17 and 30. Among these banks, the SA banking industry comprises of four major banks representing about 83% of total banking assets (PricewaterhouseCoopers, 2015). Of these banks, Standard Bank leads the South African banking industry with a market share of 25%, trailed by ABSA and FNB both at 20% (BASA, 2014). According to Banking Association of South Africa (2014), the banking sector increased its assets by 3% between December 2013 and March 2014 to over R3,9 trillion. This was 7% more than the value recorded during the same period in previous years (BASA, 2014). Although these four major banks have been at the forefront of the banking sector, statistics shows that Capitec is the fastest growing bank in the industry with approximately 20.6 % market share (Capitec, 2016).

Banking and financial institutions affect the day-to-day activities of almost everyone (Kamarulzaman & Madun, 2013). Their role in the economy forms a major part of a country's money supply (Casu, Girardone, & Molyneux, 2015). In today's global economies, banking has been one of the core contributors to any country's gross domestic product (GDP) due to its service-based products (Boshoff, 2014; Lovelock & Wirtz, 2011). Traditional banking has dominated for decades in SA; however, increases in innovativeness and changing customer needs both in the domestic and international arena have seen major changes take place in the sector (Casu *et al*., 2015; Lovelock & Wirtz, 2011).

In spite of its "developing marketplace" position, SA has a refined banking and financial sector (Ondiege, 2010). The country's fusion into the international circle has incorporated a pool of foreign competitors creating a fundamental system of doing business in SA. Consequently, the codes of practice governing the banking and finance sectors have experienced significant improvements to raise them to global standards (Falkena, Bamber, Llewellyn, & Store, 2001).The banking and financial sector, with other services sectors, has been shown to be a pillar of the country's economic growth,

enhancing growth in many domestic businesses (Boshoff, 2014; Lovelock & Wirtz, 2011). SA's banking sector compares favourably with those of industrialised countries (BASA, 2014). Foreign banks are well represented and electronic banking facilities are extensive with a nationwide network of automatic teller machines (ATMs).

More innovative banking systems and products are constantly being been introduced. This development has been aided by a consistent technological revolution and financial market development. According to Casu *et al*. (2015), this innovation in banking has increased the proportion of transactions, as well as their value locally and across the borders of South Africa. Linked with innovative banking systems, technology is rapidly changing banking services and the way they are delivered (Van Der Boor, Oliveira, & Veloso, 2014). Banking is centrally an information-intensive sector, hence IT's key role in its provision (Calisir & Gumussoy, 2008; Sikdar, Kumar, & Makkad, 2015). Literature shows that innovativeness and IT play an important role in banking services (Singh, 2011). It has led to technological innovation from traditional teller based banking to the introduction of ATMs, telephone banking, mobile banking as well as Internet banking systems.

2.4 TECHNOLOGICAL ADVANCEMENT IN THE BANKING INDUSTRY

Innovation in technology in the service sector has mostly been applied to decrease and eliminate costs (Erspective & Lusch, 2015). Many sectors, especially the banking sector, use technology to regulate services by minimising the employee/customer interface which in turn is more cost effective. A wide number of customers are opting for technology-based service delivery systems (Lu, Geng, & Wang, 2015). This developing tendency increases the effect and impact that innovation in technology has on customer retention.

With consumers now preferring self-service options, particularly those that are technologically based, the way in which SQ is evaluated has also been transformed. This transformation has been due to innovation in technology leading to enormous storage capacity and speed of data transfer (Chesbrough, Vanhaverbeke, & West, 2011; Paton & McLaughlin, 2008; Staff, 2015). Thus, an entirely new service industry has now developed.

Companies with the aid of technology are noting the significance of understanding customer habits in a bid to build customer retention (Oyeniyi & Joachim, 2008). Several companies are now anonymously collecting information on consumers' common transactions (Competition and Markets Authority, 2015). This aids in facilitating customer loyalty and building repeat purchases which result in higher sales and profits (Lau, Cheung, Lam, & Chu, 2013; Rauniar, Rawski, Crumbly, & Simms, 2009). In the mobile banking sector, continuous innovation has been seen to aid in customer retention. The information and communication technologies (ICT) sector in SA is the largest and most innovative in Africa (Bilbao, Dutta, & Lanvin, 2013). Since the nation is well known for advanced wireless and satellite communication in Africa (Bilbao *et al*., 2013; Boshoff, 2014), this has led IT companies to establish subsidiaries in different cities across the nation.

Software applications are a developing business in South Africa, with the diversity of the local market, and a developing country environment is ideal for first-hand innovations (Molla & Licker, 2005). It has been noted that systems and software development in the banking and financial services sector presents a significant investment opportunity as well as developments in hardware and associated services (Coote & Coetzee, 2012; Gu, Lee, & Suh, 2009; Mallat *et al*., 2004; Singh, 2011; van der Boor *et al*., 2014). Section 2.4.1 addresses mobile banking – a result brought about by software development in the banking sector.

2.4.1 Mobile Banking in SA

The advancement of technology in mobile phones places South African banking organisations in exceptional positions to use these improvements for value-added services (Singh, 2011). Mobile banking is an innovative mode of banking that allows customers the chance to manage accounts, open new accounts, send money, view account balances and transaction history, transfer between accounts, cancel, order and activate cards, view and manage rewards, withdraw cash without a card, share investing and stockbroking, send and receive global payments, make and authorise payments, transfers and collections as well as authorise new users and recipients, amongst others.

Mobile banking uses a software application provided by the bank. These mobile banking services are available on a 24-hour basis. Mobile banking provides opportunities for partnerships between customers, non-bank financial institutions, and banks. Mobile banking has now been customised to Short Message Service (SMS) banking, USSD/cellphone banking, website mobile banking (MB web sites) and application mobile banking (MB app). South Africa already has 97% mobile phone network coverage and is seen as having a conducive platform for the evolution of mobile banking models (Shambare, 2011).

The majority of studies on mobile banking have been conducted in foreign countries (Afshan & Sharif, 2016; Hanafizadeh *et al*., 2014). Some of these studies have concentrated on adoption of mobile phone banking and factors influencing the use of mobile phone banking (Kazemi *et al*., 2013; Shaikh & Karjaluoto, 2014, 2015). From a South African perspective, few studies in relation to mobile phone banking have been conducted. However, these studies have been conducted to validate mobile phone banking in the South African context as the new, growing banking platform (Duff, 2014; Ondiege, 2010; Porteous, 2006; Shambare, 2011; Van Velden *et al*., 2015; Wilson, 1999).

Following the validation of mobile banking, various studies in South Africa and globally are examining innovative technologies in mobile banking (Hodgkinson, 2015; Krugel, 2007; Ngai & Gunasekaran, 2007). Since mobile banking was first introduced, new models and features have been continuously added and improved upon. Up until today, mobile banking and perceived SQ have received little research consideration locally and abroad (Meyer, 2015; Mishra & Singh Bisht, 2013; Ngandu, 2012; Nicholson, 2015).

South Africa is placed as one of the countries in sub-Saharan Africa (behind Mauritius) with a high Internet penetration (Beneke, Acton, Richardson, & White, 2011). It is well known that SA businesses have taken advantage of the predisposition towards ICT in which the banking sector is at the forefront. According to Matthew (2013), First National Bank (FNB) was the first to launch mobile banking through its transaction confirmation texts in the early 2000s. The messages were sent as an in-contact text to notify customers of transactions conducted in their accounts.

In today's banking system this service has flourished from in-text transaction notification to email notifications and mobile banking application confirmations as well. Absa also followed by launching its notification service called Notify Me (Fisher-Fisher, 2010). Most of FNB's in-text notifications through the bank differ from those offered through the banking application in that the in-text only shows transactions below a certain limit of transactions, while the banking application gives a notification of all transactions (Porteous, 2007). Banks like FNB have further devised the provision of their own telecommunication networks which enable customers to use SIM cards just like Vodacom or MTN SIM cards (Wilson, 2015). This offering has flourished and FNB now sends in-contact SMS messages to millions of clients every month notifying them of financial transactions on their bank accounts.

The first major mobile banking transactions by FNB were launched in 2005 (Morawczynski & Miscione, 2008). Standard Bank launched its first mobile banking in 2001, however, unexpected lower consumer adoption of the banking system led to fewer future investments until 2005 (Donner & Tellez, 2008) when Standard Bank partnered with MTN on a service called MTN Money Transfer – the first time that a mobile operator partnered with a bank to offer a mobile phone banking service (Matthew, 2013). The investment in this mobile banking channel was found to be expensive due to its unattractiveness in the market which led to the service being discontinued. In 2010, FNB introduced eWallet which enables customers who have FNB accounts to send money to any mobile number. This was further enhanced to enable mobile banking applications users also to send money to any mobile number (First National Bank, 2012). Upon receiving the money, the receiver obtains a text message which also includes a password showing the amount received in their eWallet.

As competition forces rivalries to imitate each other and try to exploit revenues from developing market shares, the introduction of eWallet led to Standard Bank further launching Mimoney and Instant Money (Gordon, 2010) which then also led to ABSA introducing similar services called Send Money (Matthew, 2013). The same year that Standard Bank introduced its mobile banking, Capitec received its trading licence (Capitec, 2008). After opening its doors, it took Capitec six years to introduce mobile banking. Further updates to absorb technological advancements were conducted in

2009. Though the bank is still at its embryonic stage, it has strived to match its services to those offered by the four major banks (Capitec, 2008).

Similar to Capitec was Nedbank which followed the trail set by competitors and launched its mobile banking in 2006 (Ntingi, 2006). Further realising a significant market share it could tap into, in mid-2014 Nedbank launched Send-iMali similar to FNB's eWallet (Ntingi, 2006). Therefore, the growth in the mobile banking industry in SA has been enormous with innovation in technology. The main mobile banking forms that have been dominating in the South African banking retail sector will be discussed next.

2.4.1.1 Current status of mobile banking

The South African mobile banking sector is different and known for its well-regulated banking industry (BASA, 2014). The South African major banks that offer mobile banking are Absa, Standard Bank, FNB and Nedbank (Matthew, 2013) with Capitec closely following (Singh, 2011). These banks have implemented application software from WAP technology which enables the use of mobile banking applications whereby customers access banking applications via their mobile phones either through the banks' mobile websites or downloadable banking applications from Google Play (Ondiege, 2010). Apart from WAP technology and banking application software, these banks have also implemented USSD technology.

Mobile banking services in South Africa can be accessed through registration at a bank's branch, ATMs, online banking and through a call centre (Makore, 2011; Singh, 2011). A study by Matthew (2013) identified that the most prevalent mobile banking modes are SMS banking, USSD banking and mobile banking applications as shown in Figure 2.1 below.
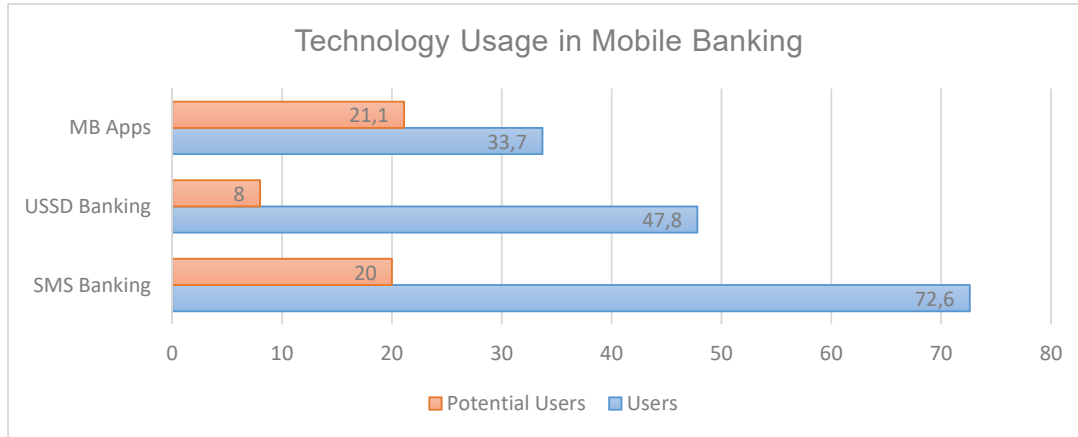
Figure 2.1: Technology Usage in Mobile Banking (Matthew, 2013, p. 5)

Matthew (2013) states that the early research showed greater increases in consumers' usage of SMS and USSD banking, as opposed to mobile banking applications. However, these facts have changed within recent years owing to an increase in technological innovations and smartphones. According to the Google Play application store, FNB has had between 1 million and 5 million downloads which easily translates into a base indication of users from early 2016 to mid-2017 (Google Play, 2017). Standard Bank, Nedbank and Absa have had over half a million downloads (Matthew, 2013). Therefore one could argue that mobile banking application usage is becoming even more popular than USSD banking and SMS banking, although there are no empirical facts to support this statement (Writer, 2014). This shows that the success of mobile banking has been dependant on the innovation of mobile phone technology.

2.4.1.2 Innovation in mobile phone technology and banking

Online banking and mobile banking are well known as part of a comprehensive electronic banking system (Shaikh & Karjaluoto, 2014). Online banking, which is also known as Internet banking, is defined as an "electronic banking medium through which customers are enabled to remotely perform a variety of banking transactions electronically through the bank's website" (Santouridis & Kyritsi, 2014, p. 502). This has traditionally been conducted through laptops, desktops and at the bank through set computers.

However, present-day customers enjoy the privilege of mobile phones which allow mobile phone users and customers to access the Internet and engage in online banking (Church, Ernest, & Oliver, 2011; Humphreys, Von Pape, & Karnowski, 2013; Schmiedl, Seidl, & Temper, 2009). The appearance and sensation of the interface of mobile banking have closely been related to online banking through a personal computer interface (Shaikh & Karjaluoto, 2014; Singh, 2011). However, with the state- of-the-art technology this has changed. Several banks in South Africa and worldwide have customised mobile banking websites to conform to the medium being used to conduct a transaction (i.e. computer website and a mobile website).

The original definition of online banking requires alteration to offer and deliver a more clear distinction between online banking and mobile banking since these different forms of electronic banking are mutually related due to their reliance on the Internet (Shaikh & Karjaluoto, 2014; Singh, 2011). The difference between Internet banking and mobile banking lies in the medium used to do the transaction; online or Internet banking refers to an electronic banking system that allows customers to perform a wide range of banking transactions electronically via the bank's website by using a computer or desktop, while mobile banking refers to banking transactions performed using smartphones or tablets instead of a desktop computer (Shaikh & Karjaluoto, 2014).

Conducting banking transactions through a computer web browser provides a complete list of options for different services (Tan, Chong, Loh, & Lin, 2010). Through this mode, customers can conveniently schedule payments, transfer funds, add new payees, open new accounts, apply for loans, view current and past statements and access information about certain cheques that have been made. However, mobile banking innovation has enabled banks to offer new platforms to customers such as mobile banking applications and continued innovation in USSD/cellphone banking (Porteous, 2006). This has been seen with mobile banking providing similar benefits to the consumer that match those offered on online banking.

Mobile banking and online banking services offer convenience, cost-effectiveness and time saving, which makes mobile banking well-matched with online banking from the viewpoint that it matches the ideal banking way and existing banking routines made possible by Internet banking (Shaikh & Karjaluoto, 2014). Mobile banking came as a

result of online banking. Mobile banking has advanced itself to mobile banking applications which enable users to log-in their accounts using a software application (mobile banking application).

Mobile banking has become prevalent worldwide. Other traditional banking infrastructures around the globe have been replaced so that mobile banking is the primary banking option (Burger, 2010; Gordon, 2010; Mobile Ecosystem Forum, 2015). A study by Bick, Brown, and Abratt (2004) discovered that customers in South Africa have mixed feelings on banking, specifically the mode of banking. They discovered that customers were not satisfied with the service they received and were opting for other banking modes in the quest to receive better service. These respondents/customers preferred electronic banking compared to banking at the branch. This discovery further showed that customers were willing to trade off customer contact or visits to the branch and opt for technologically based modes of banking.

With a few exceptions, mobile banking, typically conducted via mobile applications, offers the same basic features as browser-based online banking (Matthew, 2013). In particular, mobile banking emphasises transactional features, such as bill payments, withdrawals without a card, prepaid airtime purchases, check deposits (where available, this feature allows a customer to take a picture of a cheque to be deposited), mobile person-to-person payments, and balancing (Writer, 2014). Mobile banking is being offered primarily through applications, text messages, mobile browsers and USSD banking (known as cellphone banking). In this study, the researcher will discuss all mobile banking systems but mainly focus on mobile banking applications and USSD banking in the following section.

2.4.1.3 Systems of mobile banking

The technological innovations and usage of smartphones to provide basic and advanced financial services and allow participation in economic development symbolises an exceptional opportunity for banks and financial institutions to support the growth of poverty stricken people around South Africa (Dobush, 2015; Fenu & Pau, 2015; Shaikh & Karjaluoto, 2014). This helps customers to overcome some of the difficulties that existed in accessing and affordably using traditional banking services (Parasuraman,

Zeithaml, & Berry, 1985; Singh, 2012). The first banking services were offered through the banks' premises and online banking. This created hardships for the market segment of consumers who not only could not access bank premises and computers but also those who could not afford the means to connect to the Internet, such as modems.

Thus far, a few scholars have considered the importance of SMS and USSD banking (Adewoye, 2013; Krugel, 2007; Matthew, 2013), however, nothing has focused on mobile banking applications and USSD banking in relation to perceptions of SQ and its impact on customer loyalty.

2.4.1.1.1 SMS banking

Mobile banking by means of SMS banking services is regarded as the most common and longest standing mobile banking system (Gu *et al*., 2009; Shaikh & Karjaluoto, 2014; Singh, 2011). It is considered easy to use since the service is facilitated by the bank in conjunction with the network operator. According to Axis Bank (2016), SMS banking services are available on all phones since the service simply works like SMS services. However, if upgrades are needed, the service requires a customer to send a text message to a specific number which then instantly sends a response.

The services offered by mobile banking via SMS banking consist of account summary report, balance enquiry, mini statements and prompt SMS notification on every activity related to one's account (Thulani, Kosmas, Collins, & Lloyd, 2011). SMS banking charges vary from one bank to the next, however, the network operators charge normal rates for the SMS service. SMS banking is closely related to USSD banking but is more limited. Unlike USSD banking and MB apps, SMS banking is a one-way based way of banking. It is usually available for enquiry without conducting any transactions, hence most people use it for alerts on banking activities only and its services are regarded as limited (Chandran, 2014).

2.4.1.1.2 USSD banking (Cellphone banking)

Although SMS banking was considered to be used by the majority of South Africans when it was launched (Matthew, 2013), it has been overtaken by USSD banking which

was originally designed and introduced targeting the rural areas (Ivatury& Pickens, 2006; Masocha, Chiliya, & Zindiye, 2011). This has been facilitated by the incorporation of banked and unbanked customers as well as the convenience to access banking accounts distantly from the bank's infrastructure. USSD/cellphone banking services can be used by customers who possess any type of mobile phone, with or without a GPRS connection (Shaikh & Karjaluoto, 2014). Mobile banking through this service is centred on actual time which the customer conducts a transaction with the bank. The service is conducted through dialling certain codes (which differ from bank to bank). However, for an individual to connect to this service they have to register their mobile number with the bank to have the service available (Matthew, 2013). Though the service is free of charge from the bank, other charges from the mobile network provider may be applicable.

The most common services offered through USSD banking services include viewing balances, buying prepaid airtime, electricity, SMS and data bundles, sending money, paying accounts, applying for loans, making payments (incl. once-off payments), transferring money between accounts, and placing notices on savings accounts (Nyeko, Moya, Kabaale, & Odongo, 2014). While this service is commonly used, the innovation and technological advancement in mobile applications has led to the development of MB banking applications.

2.4.1.1.3 Mobile banking applications (MB apps)

Mobile banking which is well-known as mobile banking apps (MB apps) by the general public "is a service which allows you to access your bank account details and transact over the internet through a mobile banking application" (Axis Bank, 2016).The service is accessible through mobile data services (2G, 3G or even 4G in certain regions) or Wi-Fi. MB apps are optimised for IOS, Android and Blackberry phones (Matthew, 2013) and can also be used on java/non-java mobile phone handsets with the use of GPRS network connection. MB apps are downloaded from the bank's website or Google Play Store.

 MB apps emulate a majority of banking services provided by the bank on one's phones and give customers the freedom to carry out most banking activities (Axis Bank, 2016; Matthew, 2013). The most commonly available services offered by South African banks through MB apps include the right to use one's bank accounts anytime, access and

download account statements and transaction history, send and transfer money to various accounts as well as different banks worldwide, pay accounts and bills such as water, electricity and telephone, request cheque books and stop order payments, as well as locate nearest branches and ATMs. Notably, in SA services offered through MB apps differ from one bank to another.

2.5 SUMMARY AND CONCLUSION

The intention of this chapter was to outline and elaborate on technological adoption in South Africa's banking industry. The significance of the service industry and mobile banking in SA were also discussed with special attention directed to USSD/cellphone banking and MB apps innovation. A discussion was conducted on the various modes of mobile banking detailing their functionality.

Considering the suggestion that appropriate SQ models could practically contribute to customer retention and profitability, Chapter Three will emphasise the development of the conceptual models of SQ. Moreover, Chapter Three will examine SQ models that have been utilised before, as well as the concept of customer loyalty and it's relation to perceived SQ.

CHAPTER 3: THE DEVELOPMENT OF THE CONCEPTUAL MODELS

3.1 INTRODUCTION

Chapter Two discussed and introduced the primary focus of the study which is technological adoption in South Africa's banking service industry. The chapter looked into the retail banking industry as one of the contributors of national income and their role in the service industry of South Africa. Additionally, the chapter discussed improvements that have been brought about by technology, leading to new banking channels facilitated through smartphones.

In this chapter, the development of the conceptual models will be presented beginning with an introduction and background on the concept of quality. Thereafter the reader is introduced to SQ models and important SQ aspects.

3.2 THE CONCEPT OF QUALITY IN BUSINESS

Managing quality is fundamental for both large and small businesses. Quality products help to maintain customer satisfaction and loyalty and reduce the risk and cost of replacing faulty goods (Chetan, 2015). Companies can build a reputation for quality by gaining accreditation with a recognised quality standard or simply by following a culture of excellence through its products, processes and employee customer orientation. Quality helps magnify or reduce a company's goodwill or reputation. Outstanding reputation for quality can be a significant differentiation in markets that are very competitive, whereas low quality or a product failure that leads to a product recollection campaign can create adverse publicity and damage reputation (Chetan, 2015).

Quality offers competitive advantage which increases a company's efficiency, innovativeness, and reduction of waste (Gebauer, Gustafsson, & Witell, 2011). It can also create motivated and productive employees, profits and revenues as well as a loyal customer base. The concept of quality management was introduced in the 1930s as a statistical control measure (Strömgren, 2007). The measure was first applied to determine defects in tangible goods. There are many definitions of quality available in the literature, however, a definition accredited to quality guru Crosby (2017) has received

much attention which led to the common definition used to date (Chandrupatla, 2015). In his definition, Crosby (2017) emphasised conformance to requirements, uniformity and dependability as well as ability to meet expectations. Several other authors have further defined quality based on the defects of goods and the increase in the service industry (Parasuraman *et al*., 1985; Strömgren, 2007).

Quality refers to conformity to requirements or fit for the purpose intended (Parasuraman *et al*., 1985). In the 1980s, as the concerns about customer satisfaction and attention on product quality increased, the concept was applied to measure the quality of service delivered by service industries.

3.3 SERVICE QUALITY MODELS

In today's business environment, a company's success is rated by how well it manages risk, controls operating expenditures, and maximises returns and shareholder value. Although this has been significant, due to increasing competition, several companies have included other means through which they can differentiate themselves (Parasuraman *et al*.,1988; Parasuraman *et al*., 2005; Zeithaml *et al*., 1996). The major approach which has been used extensively to gain a competitive advantage in numerous business sectors is delivering high-quality products or services. It has been discovered that quality is a prerequisite for any success seeking entity if not a means for survival.

The increase in the popularity of SQ has led to a large number of businesses using it for different purposes including marketing. This has been witnessed in the banking and public sectors in SA, as well as other industries such as tourism, health, education, transportation, hospitality and management. Parasuraman, Zeithaml, and Berry (1991) suggest that companies can gain a competitive advantage by means of technology for the purpose of increasing SQ and boosting market demand. The concept of SQ has led to different perspectives by different researchers (Parasuraman *et al*., 1988; Parasuraman *et al*., 2005). SQ is essentially a perceived attribution grounded on a customer's experiences about the service (Chang, 2009; Parasuraman *et al*., 1992; Zeithaml *et al*., 1996).

As suggested, the concept of SQ should be approached from the customer's point of view, because it may have different values, different grounds of assessment, and different circumstances (Kim *et al*., 2006). Kabir and Carlsson (2010) emphasise that customer evaluation of SQ is based on two dimensions: technical quality and functional quality. These dimensions pose a significant effect on the business image and the sensitivity of customers to quality in many forms. SQ is not only involved in the final product and service linked to the customers, but also in the production and delivery process through which employee involvement in process restructuring, delivery and commitment are significant (Buttle, 1996; Osei, Opoku, & Seth, 2016; Parasuraman *et al*., 1988).

The growth in SQ has led to the development of different models and scales to measure SQ. This has been subject to the richness in the context of definitions, models and measurement issue. A number of academics have explored the issues of SQ with varying perspectives and using different methodologies. The following section will discuss the major models of SQ.

3.3.1 Service Quality Models

The Nordic model is one of the conceptual approaches brought forward by Grönroos (1984) in order to understand the concept of SQ. The model was developed in 1984 and consisted of company image, technical and functional quality as its factors. In the Nordic model the customer compares the expected service with the actual service received (Seth, Deshmukh, & Vrat, 2005). Therefore, the purpose of the model was to enable and help firms understand customers' perception of quality and how it is influenced. Thus, in order for companies to match perceived and expected service, satisfaction has to be achieved. This led to the three major components of the model which are technical quality, functional quality and image. Furthermore, the Nordic model was the foundation through which the Gap model was developed. The Gap model, proposed by Parasuraman *et al*. (1985), is the most common, reliable, valid and prominent model extensively used for decades since its development and which other models have been derived from. Parasuraman *et al*. (1985) suggest that the customer's view of quality is based on the comparison of service delivered and customers' expectations. Through in-depth interviews and focus group discussions with companies in four diverse service

sectors, Parasuraman *et al*. (1985) devised the model of SQ. The model is depicted below in Figure 3.1.
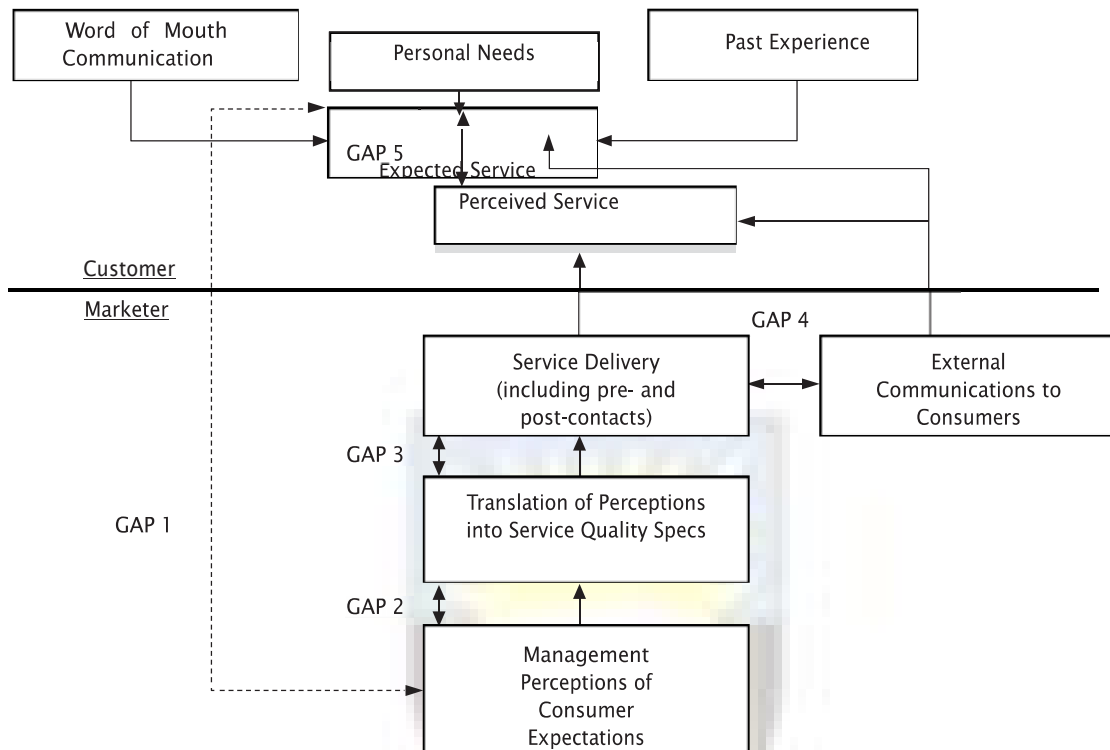
Figure 3.1: A conceptual gap model of service quality (Parasuraman et al., 1985, p.44)

The Gap model identifies possible discrepancies in SQ or areas where there could be inconsistencies concerning customers' expectations and their perceptions. According to Parasuraman *et al*. (1985), this model comprises five shortfalls and the central notion of the model is built on the premise that SQ is reliant on the size and direction of the five gaps that can exist in the service delivery process.

- ➢ *Gap 1* is what customers expect and how the management perceives these customer expectations.
- ➢ *Gap 2* is the dissimilarity that can exist between what management perceive are customer expectations and the translation of these expectations into SQ specifications.

- ➢ *Gap 3* is the difference between the SQ specifications and the delivery of those specifications to the customer.
- ➢ *Gap 4* is the difference between the service delivered to customers and the external communications about the service.
- ➢ *Gap 5* is the difference between customers' perceptions of an actual service experience and the customers' expectations of an ideal service.

The first four gaps in both the different business sectors are recognised as functions of the way in which service is provided from the supplier to the customer, while gap number five is connected to the customer and as such is considered to be the truth of SQ. Other researchers cited that it is imperative that service sector organisations express the level of quality at which to operate (Berry & Parasuraman, 1992; Iranzadeh & Chakherlouy, 2004; Zeithaml *et al*., 2002). They claimed that it is further appropriate to speak of the "right quality" than of simply high quality.

The subject of how best to conceptualise and operationalize SQ is still a subject of heated debate (Collier & Bienstock, 2006; Seth et al., 2005). It is generally agreed that SQ is a multidimensional or multi-attribute construct in research (Parasuraman *et al*., 1988). This has been seen as the strength of the SERVQUAL model in measuring SQ and that consumers varied in both their overall expectations with regard to SQ and their expectations of each of the SQ dimensions.

Several other SQ models such as the three-component model and SERVPERF model (Cronin & Taylor, 1992) have been developed; however, this study will focus on the SERVQUAL model (Parasuraman *et al*., 2005) as it has been adapted and used in similar technology related studies. This model pioneered by Parasuraman *et al*. (1988), measures SQ and discusses the scale's properties and potential applications. For assessing the quality of a firm's services, the authors measured customers' perceptions of quality and the scale involves the notion of perceived quality. The SERVQUAL model further offers a multidimensional aspect of measurement embedded within the SQ theory and this has enabled it to be utilised in multiple service sectors (Parasuraman *et al*., 1985, 2005).

Until today, the SERVQUAL instrument has been widely used for measuring SQ in multiple disciplines (Agbor, 2011; Ayo *et al*, 2016; Blut *et al*., 2015; Kim & Nitecki, 2014). It focuses on the link between what the customers feel and expect the company to offer in relation to what is currently offered. SERVQUAL has been known to be adaptable to non-Internet based studies in which it has been applied to marketing, traditional banking and other different sectors. The shift to internet marketing and service delivery has led to the introduction of the adapted SERVQUAL scale to measure service delivered through electronic devices in different industries.

Unquestionably, the SERVQUAL model tends to play a significant role in high contact industries (where there is high contact between the customers and the service supplier) such as banking institutions (Parumasur & Krishundutt, 2009). The service sector is now confronted with essential business challenges in this turbulent environment. The need to know what, when and how customers expect their service is the key concern. Therefore, increasing competition from other companies and continuously evolving technology and customer demands for success and standardisation have led to different businesses adopting innovative approaches to sustain and improve service delivery and address the persistent changes in the business environment.

3.3.2 Dimensions of the SERVQUAL Model

Companies' usage of present-day technology in service provision should surpass its customers' expectations (Paton & McLaughlin, 2008). In a bid to understand the market fully, the SERVQUAL instrument has been one good way to measure SQ due to its composite characteristics. Parasuraman *et al*. (2005) state that attentiveness in the concept of SQ is therefore reasonably high and the provision of higher levels of SQ are beginning to be considered significant to service suppliers' efforts to position themselves more effectively in the marketplace. Nevertheless, the inherent problem in the application of the original SERVQUAL approach has been identified by a number of investigators. This has led to some authors suggesting that SQ is hard to express and measure, hence making it difficult to meet customer expectations.

Though some studies have unsuccessfully questioned the five-dimensional measurement scale, Parasuraman *et al*. (1992) endorsed the five-dimensional scale of

SQ on the theoretical and real-world application. The five-dimensional model was a synthesis of Parasuraman *et al*.'s (1985) ten original dimensions to assess customer perceptions of SQ. The following ten determinants impact the appearance of a gap in the SERVQUAL model: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the customer, and tangibles.

Access: Describes how much ease there is to reach the service provider or access the service provider's facilities geographically, by phone, website, or application.

Reliability: It is associated with the uniformity of performance and trustworthiness. According to Strömgren (2007), reliability is the dependability of the service provider to be able to provide a service as promised without deviating from the anticipated service.

Credibility: It relates to the assumption that the company has the customer's best interest at heart. Factors that affect the credibility are the company goodwill, name, reputation, personal characteristics, and the degree to which the hard sell is connected to interactions with customers (Parasuraman *et al*., 1985).

Security: Refers to identifying the possible threats to customers and understanding that each threat poses a certain level of risk through either interruption, interception, fabrication or modification of a user's information and accounts (ElFgee & Arara, 2014; Kabir & Carlsson, 2010).

Understanding/knowing the customer: Understanding the customer is about creating an effort to recognise the customer which includes knowledge about specific requirements, providing personalised attention, and distinguishing regular customers (Kabir & Carlsson, 2010).

Responsiveness: This "factor concerns to what extent the employees are prepared to provide service" (Kabir & Carlsson, 2010; Zeithaml et al., 1996). This includes factors such as sending business transaction slips immediately, calling a customer back in a short time, and giving prompt service.

Courtesy: This dimension involves graciousness, reverence, respect, and friendliness of interaction personnel including receptionists, telephone operators and so on (Kabir & Carlsson, 2010).

Communication: Entails the personnel, equipment and facilities that actively enabled two- way communication between the customer and the service provider.

Tangibles: It solely deals with how things appear (i.e. appearance of machines, buildings, staff clothing, etc.) which have been discovered to be the least important factor in the service sector.

Competence: Refers to the knowledge and skills that the personnel possess to conduct or perform the service (Parasuraman *et al*., 1985). The technical expertise of both the service provider and personnel plays a critical role in the delivery of service. For example, ensuring that the software developer for USSD codes and mobile banking applications have the necessary expertise for proper coding for a well-functioning application (Parasuraman et al., 1985).

The SERVQUAL measurement items were developed from the ten constructs discussed above and include the original structure of the SQ concept (Ribeiro, 1993). The recommended conceptualization of SQ was conducted by Parasuraman *et al*. (1988) to measure expectations and perceptions separately, consisting of 97 items, signifying different aspects of SQ. Constructs were grouped into different statements to measure perceptions and expectations on the overall service performance of a firm in question (Parasuraman *et al*., 1988).

The measuring mechanism was subjected to different stages of data collection and refinement, where a sample of 200 respondents was interviewed. The result of the first scale modification was condensed from 97 items to 34 items *(*Parasuraman *et al*., 1988).The second stage evaluated the robustness of the 34-item scale by assessing its component reliability and was reduced to 26 items and the dimensions to five. These five dimensions included three original and two combined dimensions (Ribeiro, 1993). As indicated, Parasuraman *et al.* (1988; 1992; 2005) condensed the ten factors to five using factor analysis. The improvement led to a reduction of the scale from 34-item scale to a 22-item SERVQUAL scale for measuring SQ. The five dimensions include tangibles,

reliability, responsiveness, assurance and empathy. This enabled the SERVQUAL scale to be extensively used to measure SQ in different service settings (Zhao, Bai, & Hui, 2002). Apart from being widely used, the instrument has also broadly received verification in different sectors for its validity and reliability (Adil, Akhtar, & Khan, 2013; Kim & Nitecki, 2014; Parasuraman *et al*., 1988; Rodríguez-Pineda, 2000; Iranzadeh, & Chakherlouy, 2004; Tsoukatos & Mastrojianni, 2010; Tsourela, 2014). These five dimensions are:

Tangibles: These are facilities, machinery and equipment, as well as the appearance of personnel.

Reliability: The ability to offer and deliver service as promised.
Responsiveness: Degree to which staff is willing to help and assist customers quickly.

Assurance: Knowledge and courtesy of employees and their ability to convey trust and confidence.

Empathy: Caring, individualised attention the firm provides its customers (Ribeiro, 1993; Parasuraman *et al*., 1988).

This SERVQUAL model comprises aspects of the main ten dimensions (Parasuraman *et al*., 1988). The dimensions assurance and empathy consist of measurement constructs presenting seven of the original ten dimensions (Ribeiro, 1993). The dimensions represented by assurance and empathy are communication, security, credibility, competence, courtesy, access and understanding/knowing the customers which showed no distinction between each other (Parasuraman *et al*., 1988).

3.4 SERVICE QUALITY IN RETAIL BANKING

The banking retail sector and other financial institutions form the support of today's global economy (Neil, Douglas, & Elliott, 2013). The continuous improvement in technology and the need to stay competitive have been driving the constant changes introduced by different financial institutions in the retail banking sector. This has been reached in a bid to stay globally competitive in relation to the international market as well as offering a virtual banking system to customers travelling around the world (Mosahab, 2010).

Therefore, those banks which embrace and implement outstanding strategies to compete better are more likely to endure in the long run. Customer loyalty is one way of keeping banks competitive. SQ has been able to draw and capture the attention of major specialists, academics and executives due to its vigorous impact on the measurements of business operations, profitability, customer loyalty and satisfaction (Zeithaml *et al.*, 1996). This has been the prominent reason why various studies including this study have adapted the SERVQUAL model.

In the past, the four major retail banks dominated the banking sector in SA, owing to their efficient processes and good financial expertise. However, in today's environment, the circumstances have changed. This has been brought about by enhancing service proliferation through increasing perceived SQ (Tsoukatos & Mastrojianni, 2010). Through all these modifications, an extensively competitive environment developed to include a virtual banking platform where banks must include their traditional competitors and online international financial institutions that enter home-grown markets to get key portions of the market share.

The growth in the banking environment has been magnified through increased SQ induced through technology. This has brought customers nearer to their sellers. Moreover, it also has improved market transparency (Tsoukatos& Mastrojianni, 2010), and increased the choice of services between the different retail banks. It takes a little time for rival suppliers to imitate and offer better-quality types of banking services or products that are introduced into the market. Under these complex circumstances, the best way to outcompete rivals can only be achieved through continuous innovation and service excellence.

Notwithstanding service superiority's prominence, the banking sector is in need of a commonly accepted mechanism for SQ evaluation (Atay & Apak, 2013). Several mechanisms have been developed due to the ever dynamic structure of the banking sector which makes it continuously changing. Though this has been the case, perceived SQ studies in traditional banking have predominantly accepted and used the five elements of SERVQUAL model or some custom-made style of it (Iranzadeh & Chakherlouy, 2004; Lau *et al.*, 2013; Loganathan, 2007; Shanka, 2012). However, owing to the constantly changing banking sector, economic swings continue to nurture

retail banking consumers' habits, opinions, and needs. This has led to the identification of different factors linked with SQ in the sector, as well as different dimensions being used from one generation to the next.

Features in the description of SQ and customer satisfaction, as well as in familiarising present mechanisms to measure them in the international banking industry, form the priority of current study and practice. Different drivers of banking SQ are established and reasoned to be a representation for perceived SQ. Therefore, this has driven the continuous transformation of the SERVQUAL instrument as well as its application in retail banking, online banking and other sectors within banking. The following section will discuss the transformation of the SERVQUAL instrument: e-service quality.

3.5 TRANSFORMATION OF SERVQUAL INSTRUMENT TO MEASURE E-SERVICE QUALITY IN BANKING

In the years leading to the birth of e-service quality, Zeithaml *et al*. (2002) identified several web features at the perceptual aspect level and condensed them into 11 e-SQ constructs. After careful scrutiny of the 11 e-SQ dimensions involving elimination of factors with low cross-loadings, this resulted in a 22-item scale named E-S-QUAL with four dimensions: efficiency, fulfilment, privacy and systems availability (Parasuraman et al., 2005). This led to the origin of four e-service quality based model.

The conception of electronic service quality can be defined as a continuing mental judgement concerning a business's "distinction or supremacy" in delivered SQ (Ayo *et al*., 2016). Quality plays a critical role in enabling businesses to influence customers' buying habits for continuous support. Where businesses yield high perceived SQ, scholars believe that this will aid in customer retention (Ayo *et al*., 2016; Shanka, 2012; Zehir *et al*., 2014). Furthermore, several other studies share a mutual agreement that low and poor SQ will also lead to undesirable word-of-mouth and subsequently decrease in revenues caused by customers' migration to rivals.

It is well known that traditional studies of SQ measured the SQ relationships that are interpersonal in nature and non-Internet-based customer communications and experiences with companies. Several current research (Ayo *et al*., 2016; Beneke, Acton,

Richardson, & White, 2011; Blut *et al*., 2015; Parasuraman *et al*., 2005; Tsourela, 2014; Zehir *et al*., 2014) have concentrated on assessing the impact of electronic service quality in numerous avenues. E-S-QUAL has received considerable devotion from both scholars and practitioners in e-commerce and consideration is growing in the context of e-service and e-banking channels. These studies of SQ have shown a perpetual modification in the SQ instrument *(Osei et al*., 2016; Parasuraman *et al*., 2005, 1988, 1991). These constructs, however, have continued to evolve in relation to the place and culture where the study was conducted (Zhao *et al*., 2002), as well as changes in the market environment and technology.

Ayo et al. (2016) claim that customers are usually more inclined to adopt e-services as they enable them to satisfy their needs more adequately. With the progression and innovation in technology, e-service quality has also expanded into various mobile electronic technologies such as mobile phones. This has expanded the concept of e-service quality from its narrow-based definition (Parasuraman *et al*., 2005). Innovation in technology is leading banking and financial institutions to consider different methods of building SQ and loyalty in order to maintain competitive advantage (Oppong *et al*., 2014). Though it is understood that mobile phones are making a huge impact overall on the African economy, several companies in South Africa are still in the developmental stages with regard to this technology particularly in the banking sector (Effective Measure, 2014; Hodgkinson, 2015; Ondiege, 2010; Porteous, 2006).

The rapid growth in mobile phones and related services are now a substitute for different traditional banking services such as computer based banking, use of bank tellers and telephone banking. Mobile banking provides additional opportunities for partnerships between customers, non-bank financial institutions, and banks. Mobile banking has now been customised to website mobile banking and application mobile banking as well as USSD banking (well known in South Africa as cellphone banking) (Bizcommunity, 2016; Matthew, 2013; Shambare, 2011). In South Africa alone, there are 87% mobile phone users who also use mobile banking services (Meyer, 2015). It is further believed that South Africa has a growing market where mobile banking models are going to evolve.

The banking sector has embraced and technologically advanced the uses and application of ICTs in a bid to deliver more fulfilling usable online services (Tsourela,

2014). Since the adaptation of e-service quality in the banking sector, different dimensions have been utilised by different researchers. Different scales have been developed to measure the e-SQ in e-commerce environments such as E-S-QUAL (Parasuraman *et al.*, 2005; Zeithaml *et al.*, 2002), WebQual (Loiacono, Watson, & Goodhue, 2002), and SiteQual (Yoo & Donthu, 2001). A review on e-service quality in Internet banking indicated that the relationship between E-S-QUAL and loyalty should be determined as a way of improving the services and to sustain electronic banking service providers' competitiveness. Several of the literature through which banking constructs have been adopted are listed below.

Table 3.1: Literature summary of the transformation of SERVQUAL in banking studies

Authors	Service Quality Constructs	Dimensions
Parasuraman *et al*. (1985)	SERVQUAL	reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the customer, tangibles
Parassuman *et al*. (1992); Parasuraman *et al*. (1988)	SERVQUAL	responsiveness, assurance, tangibles, empathy, reliability
Loiacono *et al*. (2002)	WebQual	informational fit to task, interaction, trust, response, time, design, intuitiveness, visual appeal, innovativeness, flow-emotional appeal, integrated communication, business process and substitutability
Zeithaml *et al*. (2002)	e-SQ	efficiency, reliability, flexibility, privacy, responsiveness, compensation, ease of navigation, assurance, price knowledge, site aesthetics, customization
Parasuraman *et al*. (2005)	E-S-QUAL	information availability, content, ease of use or usability, privacy or security, graphic style, reliability or fulfilment
Kim & Nitecki (2014; Kim (2015)	E-S-QUAL (Modified)	fulfilment, system availability, efficiency, privacy
Akinci, Atilgan-Inan, & Aksoy (2010)	E-S-QUAL (Reassessment)	fulfilment, system availability, efficiency, privacy
Zehir *et al*. (2014)	E-S-QUAL (Adapted)	fulfilment, system availability, efficiency, privacy
Blut *et al*. (2015)	E-SERVQUAL (Modified)	website design, fulfilment, customer service, security

Yoo & Donthu (2001)	SiteQual	ease of use, aesthetics, processing speed, security
Kumbhar (2012b)	EbankQual (Modified)	system availability, E-fulfilment accuracy, efficiency, security, responsiveness, ease of use, convenience, cost effectiveness, problem handling, compensation and contact design
Osei *et al.* (2016)	EbankQual (Modified)	accessibility, security, accuracy, contacts, navigation, e-fulfilment, customisation, efficiency, reliability, cost/price, navigation
Wolfinbarger & Gilly (2003)	e-TailQ	design, personalization, fulfilment, reliability, privacy/security, customer service
Bai, Law, & Wen(2008)	WebQual (Modified)	Functionality, usability, customer satisfaction
Kim *et al.* (2006)	E-A-S-Qual	graphic style, information, personalisation, contact, responsiveness, privacy, system availability, fulfilment
Tsoukatos & Mastrojianni (2010)	BANQUAL-R (Combination of SERVQUAL and BSQ)	assurance/empathy, effectiveness, reliability and confidence

Different academics have developed and modified e-service quality scales and utilised different dimensions (Kim & Nitecki, 2014; Kim, 2015; Kim *et al*., 2006; Parasuraman *et al*., 2005; Zeithaml *et al*., 2002). Even though Zeithaml *et al*. (2002) provided the original scale of e-SQ with 11 dimensions, further refinement was conducted by Parasuraman *et al*. (2005) to only 4 dimensions namely fulfilment, privacy, efficiency and system availability. As shown from the literature summary, there is a disparity about definite dimensions that encompass e-service quality. Although various academics have viewed this as a disadvantage, this is the strongest advantage of e-service quality as it enables it to be applied to different studies and disciplines with ease.

The summary further illustrates that different scholars have given different views on e-service quality making the conceptual framework of e-service quality varied and wide (Blut *et al*., 2015). This shows that the e-service quality model like the SERVQUAL model can be applied differently. From the summary shown in Table 3.1, several studies have utilised fulfilment, security/privacy and efficiency/ease of use/ease of navigation/functionality in the conceptualisation of e-service quality dimensions. However, price/cost, tangibles and contact have been utilised in just a few.

Clearly, the model proposed by Parasuraman *et al*. (2005) and recently by Kim and Nitecki (2014) and Kim (2015) has been widely used as a conceptual framework in e-commerce to measure e-service quality. However, other authors have different opinions which have led to some dimensions being replaced by customer service, website design and ease of use (Blut *et al*., 2015; Kumbhar, 2012b). This shows that the e-service quality model and framework is diverse and can be approached from different angles.

In the banking sector, the literature shows that other academics (Kumbhar, 2012b; Mastrojianni & Tsoukatos, 2010; Osei *et al*., 2016) have brought forward different models that suit different sectors, highly confirming the complex features possessed by the model. While these different models listed above have been utilised in different sectors such as retail, banking, company's websites, online retails and online banking, the conceptualisation is still developing in terms of services of mobile banking.

3.5.1 Dimensions of E-Service Quality

Measurements of E-S-QUAL like the SERVQUAL instrument have approved different measurements for e-service quality. For example, Zeithaml *et al*. (2002) established an 11-dimensional measuring scale for e-service quality. Furthermore, Parasuraman *et al*. (2005) and Kim and Nitecki (2014) examined and refined the scales to meet different research requirements. Parasuraman *et al*. (2005) identified information availability and content; ease of use or usability; privacy or security; graphic style, and reliability or fulfilment as the main measuring instrument dimensions for e-service quality.

As the main e-service quality includes four dimensions, in this study it is presented as a 22-item scale of four dimensions which are fulfilment (the degree to which the site guarantees completion of order or transaction), efficiency (speed and ease of using and accessing a site), privacy (how safe a site is and safeguards consumers information) , and system availability (technical functioning of the site) (Kim & Nitecki, 2014). It was developed to measure customers' perceptions of SQ online. E-S-QUAL has been applied to numerous studies over the years (Ayo *et al*., 2016; Kim & Nitecki, 2014; Parasuraman *et al*., 2005; Rafiq *et al*., 2012; Tsourela, 2014; Zehir *et al*., 2014).

3.5.1.1 Fulfilment

The fulfilment dimension has been linked to and familiarised as reliability in other studies (Kim, Jin, & Swinney, 2009; Kim *et al*., 2006; Parasuraman *et al*., 2005). According to Parasuraman *et al*. (2005), fulfilment refers to the degree to which the site's assurances about commands or directives provision and item accessibility are fulfilled. This construct encompasses precise commands and product representation. Since the construct was modified from original SQ constructs by Parasuraman *et al*. (2005), the meaning was marginally reviewed to the point to which it presented dependable and accurate information for assessing e-service quality (Kim & Nitecki, 2014).

3.5.1.2 Efficiency

Efficiency is defined as the simplicity and quickness of getting into (application, website) and using the service (Parasuraman *et al*., 2005). It is considered significant in e-

commerce since time-saving and accessibility is primarily considered key reasons for using e-services (Kim *et al*., 2006; Wahab *et al*., 2011). The construct was adapted to reflect the degree to which a platform is easy to use when performing a transaction.

3.5.1.3 Systems availability

Systems availability relates to the accurate technical functioning of the site (Parasuraman *et al*., 2005; Wahab *et al*., 2011). When consumers are online or browsing the site, problems relating to functioning, like missing links or non-working buttons, dissatisfy customers and increase the possibility of exiting (Wahab *et al*., 2011), and thereby the company may lose the opportunity to increase customer loyalty

3.5.1.4 Privacy

Parasuraman *et al*. (2005) define privacy as the extent to which the site guarantees to safeguard and protect customer information. Several customers are reluctant to purchase products and make transactions from both the Internet and their electronic devices due to the risks associated with the use of technology and misuse of customers' information (Santouridis *et al*., 2012). Service providers are now aware and used to the significance of providing consumer privacy. It has been discovered that privacy has a strong effect on customer loyalty on cell phone usage (Wahab *et al*., 2011).

3.6 TECHNOLOGY, SERVICE QUALITY AND CUSTOMER LOYALTY

The development of electronic service quality has been facilitated by information technology (Raman, Stephenaus, Alam, & Kuppusamy, 2008). This enabled the digitisation of services and thereby created a virtual marketing environment. The development started initially from online shopping, banking and a whole new marketplace facilitated by desktop computers and Internet. Moreover, developments have penetrated into tablets and in the recent years, mobile phones have been incorporated into service delivery leading to many studies of e-service quality (Standard Chartered Bank, 2015).

Innovation in technology is leading banking and financial institutions to consider different methods of building SQ and loyalty in order to maintain competitive advantage (Oppong *et al*., 2014). Though it is understood that mobile phones are making a huge impact in the overall African economy, several companies in South Africa are still in the developmental stages with regard to this technology particularly in the banking sector (Effective Measure, 2014; Hodgkinson, 2015; Ondiege, 2010; Porteous, 2006).

3.6.1 Innovation in Technology and Customer Loyalty

Innovation in technology in the services sector has mostly been applied to decrease and eliminate costs (van Zyl, 2011). Most sectors especially the banking sector uses it to regulate services by minimising the employee/customer interface thus creating a cost saving. A wide number of customers are opting for a technology-based service delivery system more than that which facilitates a traditional worker employee/customer interface (Ismail & Masinge, 2012). This developing tendency increases the level of importance that innovation in technology has on e-service quality and customer retention.

Notably, consumers now prefer self-service options, particularly those that are technologically based. With companies noticing the importance of understanding customer habits and preferences, several companies anonymously collect and record information on consumers' common transactions (Kandampully, Zhang, & Bilgihan, 2015; Lacey & Sneath, 2006). This facilitates customer loyalty and builds repeat purchases which result in high sales and profits. In the mobile banking sector, continuous innovation has been seen to aid in customer retention (Chung & Kwon, 2009; Laukkanen, 2007). However, the recent improvement in the mobile banking platform has been seen to have further grown and it is still unknown what effect is posed by mobile banking channels on customer loyalty, that is, which mode customers prefer the most.

3.6.1.1 The importance of customer loyalty

Loyal customers are essential for every enterprise as they contribute considerably to profitability (Wahab *et al*., 2011). Literature supports the fact that SQ leads to customer loyalty which thus extends the buyer-seller relationship (Ariff *et al*., 2013; Shanka, 2012; Zehir *et al*., 2014). Customer loyalty refers to a continuous commitment made by

customers to repurchase a service or product despite circumstances that might influence switching behaviour (Aldas-Manzano *et al*., 2011)

Pressure to retain customer's manifests from different sources such as cost-effective organisations and declining performance among others. In mobile phone banking, the need to keep USSD banking and banking applications up to date and competitive is key to building customer loyalty. Customer loyalty is important because it fortifies the organisation's brand image and goodwill.

Literature indicates that a relationship exists between customer satisfaction and customer loyalty. Customer satisfaction means that customers feel content and have their wants met by the product provided. In the service industry, customer satisfaction can be achieved through different means. The widely used medium to attain customer satisfaction is enhanced SQ. It is believed that SQ that exceeds customers' expectations leads to satisfied customers, which usually translates to repeat customers. Though there has been supporting from the literature that customer loyalty can be achieved through satisfied customers (Ariff *et al*., 2013; Mosahab, 2010), SQ can also be a predictor of customer retention. Therefore, the current study seeks to conduct a comparison of the effect of overall SQ of USSD banking versus mobile phone banking applications in relation to customer loyalty. In succeeding paragraphs, the relationships to be verified in this study will be presented along with the two hypothesised models.

3.6.1.2 Service quality and customer satisfaction

The discrepancy and relationship between SQ and customer satisfaction are still at the forefront of many academic and practitioner-oriented research accomplishments (Loganathan, 2007). Customer satisfaction has always been reflected as grounded in the customer's prior experiences of service encounters (Agbor, 2011). Customer satisfaction measures how products or services supplied by a company meet or surpass a customer's expectation (Beard, 2014). It is the greatest indicator of potential customer purchases which leads to customer loyalty. In a highly competitive market, customer satisfaction is seen as a critical success factor. Agbor (2011) suggests that SQ is one of the possible dimensions that can be used in measuring customer satisfaction.

Several authors have noted that customer service satisfaction lies between the perceived, expected and the actual service delivered (Kabir & Carlsson, 2010; Mosahab, 2010; Osei *et al*., 2016). Regarding the relationship between customer satisfaction and SQ, SQ is seen as leading to customer satisfaction irrespective of whether these concepts were cumulative or transaction-specific (Buttle, 1996). Several other researchers also brought forward that service satisfaction was brought about as a result of customer satisfaction (Blut *et al*., 2015; Ojo, 2010; Strömgren, 2007; Tobergte & Curtis, 2013).

In linking service quality and customer satisfaction, academics have been considerably more specific about the implication and dimensions of satisfaction and SQ. These concepts have more than one thing in common which lead scholars to suggest that they are related. Satisfaction has been discovered to be a far broader concept compared to SQ. However, SQ has been discovered to be more precise and direct through its focus on service (Agbor, 2011; Baker, 2013).

Different aspects affect customer satisfaction. Recent studies show that perceived SQ is an element of customer satisfaction. This concept acts in accordance with the conception of Zeithaml, Bitner, and Gremler (2013) and has been confirmed by the definition of customer satisfaction offered by other scholars. The link between customer satisfaction and SQ encourages repeat purchases which have aided customer loyalty and has been known to apply to most service industries. Studies in banking have also indicated that SQ, loyalty and customer satisfaction are interrelated (Ariff *et al*., 2013; Mosahab, 2010; Shanka, 2012; Zavareh *et al*., 2012). Since a relationship exists between SQ and customer satisfaction, as well as customer loyalty (Ariff *et al*., 2013), knowledge of the E-S-QUAL relationship between perceived overall quality and customer loyalty in the current study will also contribute to which features of E-S-QUAL in mobile banking that lead to customer satisfaction.

3.7 THE CONCEPTUAL MODELS

In regard to the primary and secondary aims of this research and the contextual literature provided in the preceding sections, this section will present the two suggested theorised models that will be subjected to empirical testing in Chapter Five of this study.

Relationships are put forward between selected e-service quality dimensions (efficiency, fulfilment, privacy and systems availability) and their influence on overall SQ as well as their contribution towards customer loyalty. The first conceptual model is focused on USSD/cellphone banking and related service quality whilst the second model focused on MB apps and their related service quality dimensions. In the chapters that follow, the independent and dependent variables which serve as the basis of the two models, and the resulting hypothesised relationships will be presented and discussed. The conceptual models are provided in section 3.7.1.

3.7.1 Conceptual Models

As indicated in the literature, several service quality models have been proposed. The literature indicates that the SERVQUAL measurement tool is a versatile instrument which can be used across different contexts. From several studies that were scrutinised, the E-S-QUAL derivation of the SERVQUAL instrument proved to be consistently valid and reliable across different studies and highly applicable to the context of this study.

3.7.1.1 Model of USSD/Cellphone Banking Service Quality (Model 1)
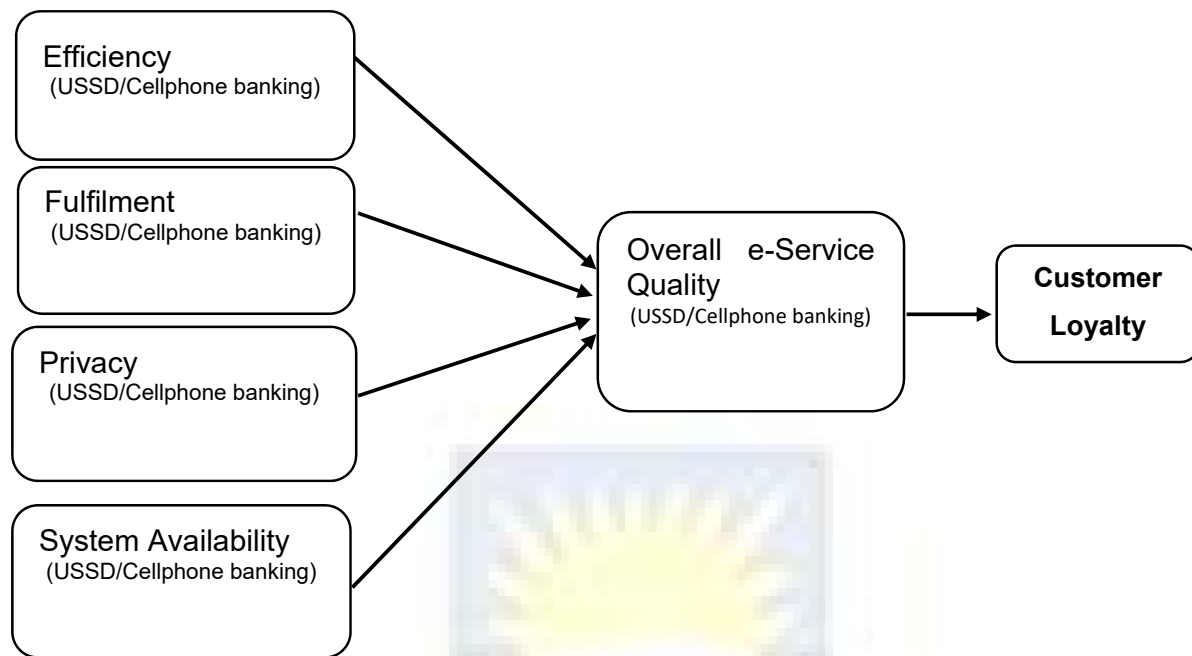
Figure 3.2: Conceptual Model for USSD/cellphone banking Service Quality

3.7.1.2 Conceptual Model of MB Apps Service Quality (Model 2)
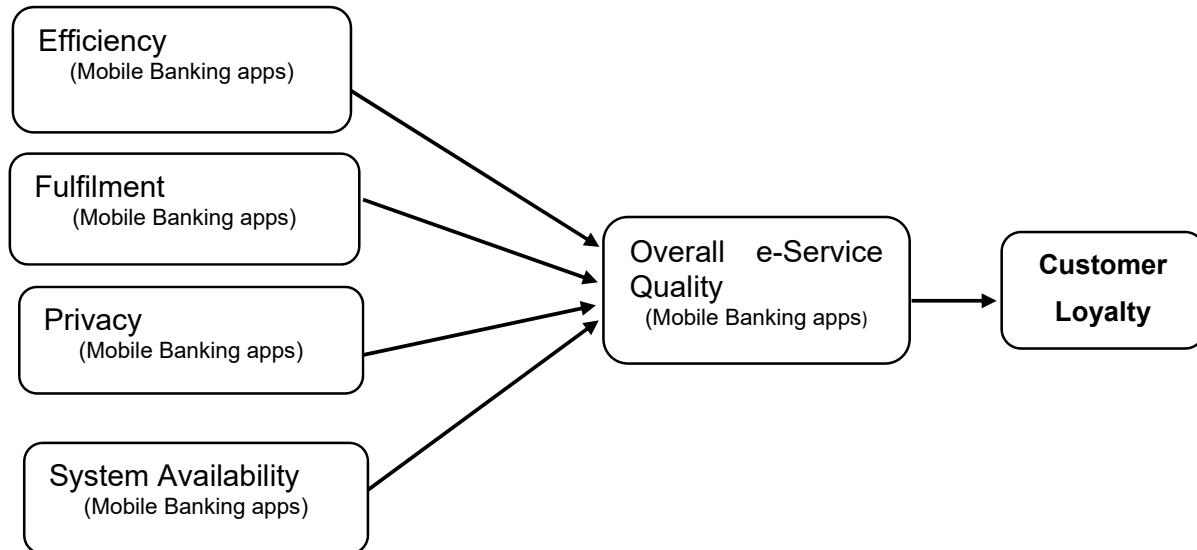
Figure 3.3: Conceptual Model for MB Apps Service Quality

Based on the above-depicted models, the hypotheses were formulated. The study objectives and associated hypotheses are reviewed in section 4.4 of Chapter Four.

3.8 SUMMARY AND CONCLUSION

In the chapter, the literature shows that SERVQUAL instrument is embedded with a multidimensional aspect which allows it to be applied in different sectors. Though some academics have proved that the instrument is not ideal in certain cultural contexts, it has been widely and successfully used to measure service quality in professional services businesses, the banking industry, the healthcare industry and many other services industries. This has led to continuous improvement of the measurement tool. With higher rates of validity and reliability of the instrument, this creates a viable measuring instrument for SQ in mobile banking, which is the focus of this study. Different models that have been previously hypothesised and adapted were also presented. Furthermore, the proposed models of the current study, based on the literature, were also presented. The main constructs of the two proposed models are efficiency, fulfilment, privacy, system availability, customer loyalty and overall service quality.

The following Chapter discusses the approaches and techniques used to gather and analyse the data. The research methodology and design will be presented along with the planned course of analysis for drafting conclusions regarding the hypotheses.

CHAPTER 4: RESEARCH METHODOLOGY

4.1 INTRODUCTION

The core purpose of Chapter Four is to explain the methodology implemented to address the objectives and test the proposed models. The chapter starts with defining research methodology. Thereafter, the research problem and objectives, research paradigm and research approaches are discussed. Moreover, topics on population and sampling, the research instrument as well as data collection and analysis procedure will be addressed. In conclusion, the section on data collection and analysis will provide a general idea of the statistical techniques implemented.

4.2 DEFINING RESEARCH METHODOLOGY

The research methodology is a vital aspect of research. It shapes the direction of research from the moment when the problem statement is formulated to the discovery of findings and finally the conclusion (Kumar, 2014; McDaniel & Gates, 2013; Wiid & Diggines, 2015). The research methodology chapter is used to present the methodology and procedures underpinning this research, as well as to introduce the research strategic plan. Research methodology and design are the systematic plans and procedure which describe the research process through which data is gathered and analysed by the researcher (Creswell, 2014). Apart from above, the methodology will provide information on the location from which the study was conducted, including instruments used to collect data and the methods executed to maintain validity and reliability.

4.3 THE RESEARCH PROBLEM

Research problem begins with main objective or purpose of the research. Sekaran and Bougie (2013) state that the research problem is there to discover solutions for the identified problem and problem statement that includes the central objective of the research.

The way people do their banking has changed. Rapid improvements in mobile phone technology have led to more and more people using their mobile phones for banking.

With the development of network services, memory capacity and advanced processing speed in mobile phone devices, consumers have moved from traditional Internet banking to mobile phone banking (Standard Chartered Bank, 2015). The innovation in technology and traditional SQ have enabled conceptualisation and measuring of electronic SQ. Numerous banks are investing heavily to improve SQ of both mobile phone banking applications and USSD banking in a bid to retain existing customers and win new ones. The majority of studies focusing on mobile phone banking are related to adoption, validation of theories and factors affecting mobile phone banking (Duff, 2014; Measure, 2014; Ondiege, 2010; Porteous, 2006; Van Velden *et al*., 2015; Wilson, 1999).

The concept of mobile phone banking in South Africa is still developing, and consumers may have SQ concerns which may lead to customers not adopting mobile phone banking (Shanka, 2012). Further to the above, continuous innovation in technology, applications and databases yields concerns for SQ in mobile phone banking which can be said to have implications on customers' long-term loyalty (Halliburton & Poenaru, 2010). Understanding customers and which offerings lead to greater customer loyalty is an important aspect for businesses and marketers alike.

Little is known about the mode of banking that delivers a higher level of customer service and loyalty. Therefore, this study seeks to compare the SQ levels of mobile phone banking applications versus USSD banking services and in turn determine their effects on customer loyalty. This will help bridge the marketing knowledge gap that currently exists in mobile phone banking literature.

4.4 RESEARCH OBJECTIVES AND HYPOTHESES

Blaikie (2003) claims that the best way to approach a research problem is through a set of research objectives. Research objectives are broad statements of desired outcomes, or the general intentions of the research, which paint a picture of the research and emphasise what is to be accomplished through the testing of hypotheses. Research objectives fall into two categories: primary and secondary objectives. The major aim (primary objective) of this study is to compare the effect of overall e-service quality of USSD banking versus mobile phone banking applications in relation to customer loyalty.

Furthermore, research objectives should be directed towards testing hypotheses (Blaikie,2003; McDaniel & Gates, 2013; Sekaran & Bougie, 2013). Hypothesis refers to a supposition or proposed explanation made on the basis of limited evidence in order to initiate a starting point for furthering investigation (Barnard, 2008). However, Kothari (2004) does not agree with the idea that a hypothesis is a mere assumption or supposition to be proved. Rather, he claims that a hypothesis is a proposition or set of propositions proposed as an explanation for the occurrence of some specified group of phenomena either asserted merely as a provisional speculation to guide some investigation or accepted as highly probable in the light of established fact (Kothari, 2004).

4.4.1 Primary Objectives

The major aim of this study is to compare the effect of overall SQ of USSD banking versus mobile phone banking applications in relation to customer loyalty. The succeeding section presents the secondary objectives achieved to fulfil the core purpose of the study.

4.4.2 Secondary Objectives

- To compare the efficiency of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
- To compare the fulfilment of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
- To compare the privacy of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
- To compare the system availability of USSD banking and mobile phone banking applications in relation to perceived overall service quality.

4.4.3 Hypotheses

The presentation of hypotheses and the ten propositions for the study were tested through PLS-SEM structural equation modelling. The hypotheses and associated

constructs are divided into two models, one for USSD/Cellphone banking and the other for MB apps, as presented in section 3.7 of Chapter Three. The following section presents the hypotheses related to the two conceptual models.

4.4.3.1 Model 1: USSD/cellphone banking service quality hypotheses

H^{1a0} *The efficiency of USSD banking does not have a significantly positive influence on overall service quality of USSD banking.*

H^{1a} *The efficiency of USSD banking has a significantly positive influence on overall service quality of USSD banking.*

H^{2a0} *The fulfilment of USSD banking does not have a significantly positive influence on service quality of USSD banking.*

H^{2a} *The fulfilment of USSD banking has a significantly positive influence on service quality of USSD banking.*

H^{3a0} *Privacy of USSD banking does not have a significantly positive influence on service quality of USSD banking.*

H^{3a} *Privacy of USSD banking has a significantly positive influence on service quality of USSD banking.*

H^{4a0} *System availability of USSD banking does not have a significantly positive influence on service quality of USSD banking.*

H^{4a} *System availability of USSD banking has a significantly positive influence on service quality of USSD banking.*

H^{5a0} *Perceived overall e-service quality of USSD banking does not have a significantly positive influence on customer loyalty.*

H^{5a} *Perceived overall e-service quality of USSD banking has a significantly positive influence on customer loyalty.*

4.4.3.2 Model 2: MB apps banking service quality hypotheses

H^{1b0} *The efficiency of mobile phone banking applications does not ha.ve a significantly positive influence on overall service quality of banking apps.*

H^{1b} *The efficiency of mobile phone banking applications has a significantly positive influence on overall service quality of mobile phone banking apps.*

H^{2b0} *The fulfilment of mobile phone banking applications does not have a significantly positive influence on service quality of mobile phone banking apps.*

H²ᵇ *The fulfilment of mobile phone banking applications has a significantly positive influence on service quality of mobile phone banking apps.*

H³ᵇ⁰ *Privacy of mobile phone banking applications does not have a significantly positive influence on service quality of mobile phone banking apps.*

H³ᵇ *Privacy of mobile phone banking applications has a significantly positive influence on service quality of mobile phone banking apps.*

H⁴ᵇ⁰ *System availability of mobile phone banking applications does not have a significantly positive influence on service quality of mobile phone banking apps.*

H⁴ᵇ *System availability of mobile phone banking applications has a significantly positive influence on service quality of mobile phone banking apps.*

H⁵ᵇ⁰ *Perceived overall e-service quality of mobile phone banking applications does not have a significantly positive influence on customer loyalty.*

H⁵ᵇ *Perceived overall e-service quality of mobile phone banking applications has a significantly positive influence on customer loyalty.*

4.5 THE RESEARCH DESIGN

A research design is an outline for the collection, measurement and analysis of data based on the research problem of the study (Sekaran& Bougie, 2013; Collis & Hussey, 2013). Similarly, Iacobucci and Churchill (2010) state that a research design is a blueprint that is followed to complete the study. According to Rajasekar, Philominathan, and Chinnathambi (2014), a research design should indicate the various approaches to be used in solving the research problem, sources and information related to the problem and time frame and the cost budget.

Various issues involved in the research design are the purpose of the study (exploratory, descriptive and casual) and research strategy (i.e. experiments, surveys, case studies and interviews), research method (quantitative, qualitative or mixed), location, sampling design and the extent of the researcher's interference. Precisely, a research design seeks to illustrate how, when and where data collection and analysis will be conducted. Collis and Hussey (2013) state that the initial step in the research design process is determining the appropriate research paradigm. The paradigm used in the current study

is positivistic paradigm discussed in the succeeding section. A positivistic paradigm is therefore associated with the quantitative research approach.

In order to determine the course of the research, a research design was selected from three main types of quantitative research designs namely: exploratory, casual and descriptive. The three major types of the research designs primarily relate to the fundamental objective of the research. Subsequent to this section is a brief description of each type of quantitative research design.

4.5.1 Exploratory Research Design

Numerous researchers (Collis & Hussey, 2013; Iacobucci & Churchill, 2010; McDaniel & Gates, 2013; Wiid & Diggines, 2015) indicate that this type of research design is utilised mostly when there is need to gain insight and ideas of the research problem. Therefore, exploratory studies are often conducted when little is known of the issues under investigation. Iacobucci and Churchill (2010) state that the key objective of exploratory research design may be to clarify concepts, eliminate impractical ideas, establish priorities, develop hypotheses and formulate research problem more precisely. Further, exploratory research identifies patterns in order to develop a hypothesis rather than test a specific predetermined hypothesis (Collis & Hussey, 2013). Therefore, since the prime objective of exploratory studies is to obtain intuition and develop understanding rather than to gather perfectly replicable data, it usually involves the methods of conducting focus groups, case analyses, experience surveys, literature searches, in-depth interviews, and projective studies and ethnographies (Wiid & Diggines, 2015; Iacobucci & Churchill, 2010).

4.5.2 Causal Research Design

According to Iacobucci and Churchill (2010) together with Wiid and Diggines (2015), causal research designs are concerned with the determination of the cause and effect relationships. This relates that the researcher explores whether one variable causes or controls the value of another variable in an effort to establish a relationship between them (McDaniel & Gates, 2013). Wiid and Diggines (2015) state that causal research designs are directly linked to predictive studies which are often used to estimate future

values. Causal research designs fall into two main categories: laboratory and field experiments (Wiid & Diggines, 2013, 2015).

4.5.3 Descriptive Research Design

Descriptive research design is intended to collect data that define the characteristics of persons, events or situations. Descriptive research is either quantitative or qualitative in nature. It includes the collection of quantitative data such as satisfaction ratings, production figures, sales figures, or demographic data, as well as qualitative data, which describes situations such as how consumers go through decision-making. According to Wiid and Diggines (2013, 2015), descriptive research analytically defines the characteristics of a specific problem or phenomenon. Furthermore, it seeks to describe patterns or trends about the phenomenon. Iacobucci and Churchill (2010) link descriptive designs to the frequency of which something occurs. Thus these studies are conducted to answer who, what, when, where and why questions (Iacobucci & Churchill, 2010; Wiid & Diggines, 2015).

This design is often used when researchers seek to describe research domain accurately and thoroughly. Methods used for descriptive research include longitudinal studies, panel and sample surveys (Iacobucci & Churchill, 2010). Additionally, the purpose of a descriptive study is generally to 'describe' (Sekaran & Bougie, 2013) and to 'draw a picture' of a situation, person or event or show how things are related to each other or to provide representation of a phenomenon as it naturally occurs (Gray, 2014). These studies may also comprise a normative study, comparing the data against some standard.

Descriptive research may be of great importance when there is need to understand the characteristics of a group in a given situation, think systematically about aspects in a given situation, and offer ideas for further probe and research (Randle, Mackay, & Dudley, 2014). However, Blumberg, Cooper, and Schindler (2011) point out one of the prime weaknesses of descriptive studies is that they cannot explain why an event has occurred.

For the purpose of this study, a descriptive research design will be accepted. In relation to several factors such as the time horizon of this study, aim of the researcher and availability of sufficient data, the study will be descriptive survey research in nature. The rationale for using a descriptive research design is that a descriptive study establishes the relationships between variables and makes specific predictions as in the case of the study.

4.6 RESEARCH PARADIGMS

Research paradigms are a group of beliefs that are believed to influence the way of conducting research and what should be studied. Babbie (2016) further claims that research paradigms are models or frameworks for observation and understanding which shape both what we see and how we understand it. The role of the paradigm is paramount to the choice of methodology and yet this is not addressed effectively. A paradigm is essentially a worldview, a whole framework of beliefs, values and methods within which research takes place. It is this worldview within which researchers work. There are two research paradigms: interpretivistic and positivist, which will be explained in the following sections.

4.6.1 Interpretivistic Research Paradigm

The interpretivistic paradigm emerged as a response to criticisms (Collis & Hussey, 2013). The paradigm rests on the assumption that "social reality is in our minds and is subjective and multiple" (Collis & Hussey, 2013, p. 57). The interpretivist research paradigm encompasses developing hypotheses and theories to understand the research problem from the participants' viewpoint. Moreover, the interpretivist research paradigm is frequently linked with a qualitative research methodology where an inductive approach to generating theory is employed (Collis & Hussey, 2013; Dudovskiy, 2016). Therefore, the use of an interpretivist model enables the existence of multiple perspectives and creating knowledge instead of trying to discover it in reality. Based on the nature of the study, this paradigm was regarded as unfit for the current study.

4.6.2 Positivist Research Paradigm

It has to be acknowledged that the doctrine of positivism is difficult to be explained in a precise and concise manner because there are vast differences between settings in which positivism is used by researchers (Dudovskiy, 2016). Positivism belongs to an epistemology which can be specified as a philosophy of knowing, whereas methodology is an approach to knowing. As a philosophy, positivism adheres to the view that only "factual" knowledge gained through observation (the senses), including measurement, is trustworthy. In positivist studies, the researcher's role is restricted to the collection of data and interpretation through an objective approach, and the research findings are usually observable and quantifiable (Dudovskiy, 2016).

It insists that prevailing understanding of phenomena must be laid aside and the immediate experience of them should be revisited in order for new meanings to emerge (Gray, 2014, p.24). Current understandings have to be linked to allow phenomena to 'speak for themselves', untainted by one's prejudices. The results then display fuller or renewed meaning. Attempts are made to avoid ways in which the prejudices of researchers bias the data.

Therefore, in this study, the researcher found it necessary to make use of the positivist paradigm. The use of this paradigm will provide the researcher with the ability to analyse the scientific data statistically whilst also recognising the ability to compare the effect of overall SQ of USSD banking versus mobile phone banking applications in relation to customer loyalty. The discussion that follows will further elaborate on how the methodological approach was implemented in this study.

4.6.2 Research Approaches

Three methodologies can be used in solving a research problem. These methods are qualitative, mixed research methods and quantitative research (Creswell, 2014; Wiid & Diggines, 2015), which will be discussed in the following sections.

4.6.2.1 Qualitative research

Qualitative research involves the inquirer often making knowledge claims based primarily on constructivist perspectives and involves any research that does not indicate ordinal values (Creswell, 2014). The qualitative research approach is used to understand the meaning people have constructed in relation to how they make sense of their world and experiences they have in the world through the use of methods such as participant observation, case studies and descriptive accounts of setting (Creswell, 2014; Creswell & Plano, 2011).

Therefore, this means that qualitative researchers study subjects in their natural settings, attempting to make sense of or to interpret phenomena in terms of the meaning people bring to them (Lincoln & Denzin, 2011). The major strength of qualitative research is its ability to provide complex, textual descriptions of how people experience a given research issue by providing information about the human side of an issue, that is the often contradictory behaviours, beliefs, opinions, emotions and relationships of individuals. The significance of the qualitative research is that it is typically flexible and allows greater spontaneity and adaptation of interaction between the researcher and participants.

However, Sekaran and Bougie (2013) cite that qualitative research usually involves relatively small numbers of participants which make it difficult to generalise the findings on a broader population, which means that it can be taken less seriously or disregarded by practitioners and policy makers. Furthermore, due to the limited time and nature of the current study, the use of qualitative research is impossible since the quantity of data makes it difficult to interpret and analyse within the stipulated time frame. The approach also does not allow the use of statistical techniques which makes it impossible for the researcher to use it.

4.6.2.2 Quantitative research

A quantitative research approach is one that is defined as the examination, analysis and interpretation of surveyed data for the purpose of discovering underlying meanings and

patterns of relationships, including classifications of types of phenomena and entities, in a manner that involves mathematical models.

Quantitative research is the systematic empirical investigation of observable phenomena through statistical, mathematical or computational techniques, with the objective to develop and employ mathematical models, theories and/or hypotheses pertaining to phenomena under investigation (Creswell, 2014; Kumar, 2014; Wiid & Diggines, 2015). This method is used to describe variables, examine existing relationships between observed variables, and to determine cause and effect relationships between these variables. Hennink, Hutter, and Bailey (2011) further emphasise that quantitative research is purposed to quantify a research problem, measure and count issues, and thereafter generalise findings to a broader population. Unlike qualitative research, it is possible to deduce findings of quantitative research because the random sampling of respondents ensures samples that are representative of the general population.

The strongest aspect of quantitative research is that hard facts and guiding statistics can be produced in order to get reliable statistical results. Quantitative researchers survey people in fairly large numbers to make sure they are representative of the target market being investigated (Creswell, 2014). However, the results of quantitative research are narrow as they provide numerical descriptions rather than details and generally provide less elaborate accounts of human perception.

4.6.2.3 Mixed research

The mixed research approach is defined as the methodology that integrates and combines other research approaches, designs and techniques to draw the strengths of qualitative and quantitative methods (Creswell, 2014). All studies base their foundation on one or more theoretical contexts. The use of mixed research enables researchers to provide means to combine these different theories. This helps researchers to understand things differently through applying statistical and theoretical analysis to establish an extended meaning of phenomena (Creswell & Plano, 2011).

4.6.2.4 Specific research approach

The previous sections illustrated that three different approaches can be used in addressing a research problem. These approaches are qualitative, mixed research methods and quantitative research. Due to the positivistic paradigm employed and thus the very nature of the study, a quantitative research approach was deemed the obvious choice of approach. This research approach enables the investigator to use and employ strategies of enquiry such as experiments and surveys and collects data on predetermined instruments that yield statistical data as indicated by Creswell and Plano (2011). The quantitative approach makes it easier to gather and manipulate data because it examines the relationships between variables, test theories and hypothesis and it is more reliable and objective while statistics is used to generalise findings.

4.7 ETHICAL CONSIDERATIONS FOR THE SURVEY

Ethics can be defined as the moral principles and set standards that govern the conduct of an individual or group (McDaniel & Gates, 2013; Wiid & Diggines, 2015). Incorporating ethics in research ensures that no one suffers or is harmed by adverse effects of research. Several ethical standards were taken into account while conducting the study. Thus, the study was subjected to research ethics approval procedures at the University of Fort Hare ensuring that no adverse effects would be experienced by respondents (Appendix B). The following ethical considerations were observed.

4.7.1 Right to Anonymity and Confidentiality

Anonymity and confidentiality are often used interchangeably although the concepts are in fact different. According to Kumar (2014), confidentiality of collected information from respondents means that the investigator of the research can identify the sensitive responses of individual subjects; however, the researcher must be determined to inhibit anyone outside of the project from linking individual subjects with their responses. If it is critical to bring together and connect identifying information to respondents, researchers must be resourceful to deliver maximum confidentiality of subjects' information. Collis and Hussey (2013) claim that giving respondents anonymity is guaranteeing them not to have their responses and opinions linked to them. Therefore, anonymity ensures that

respondents' names are not identified with their responses (Collis & Hussey, 2013). In order to ensure that confidentiality was attained in this study, respondents were not required to provide their names. Furthermore, data was coded before it was analysed to maximise confidentiality.

4.7.2 Privacy

All participants of research studies have the right to privacy. Collis and Hussey (2013), as well as McDaniel and Gates (2013), agree that the privacy battle is the most heated debate in research ethics and researchers are obliged to inhibit invasion of respondents' privacy at all cost. Breach of privacy refers to when the researcher obtains respondents' information and publicly disclose it without their formal consent (Kumar, 2014). In order to desist from invading privacy in this study, the researcher did not release or share the respondents' details.

4.7.3 Right to Voluntary Participation

The most ethical norm is that compulsion should not be used to force people into taking part in research (Collis & Hussey, 2013). Collis and Hussey (2013) state that it is essential that sufficient information is supplied to respondents so that they can make an informed decision as to whether or not they want to participate in the study. Though it is unlikely to be exposed to physical risks in business research, giving consent to respondents ensures they have adequate information to make a decision whether to participate in the study voluntarily. In this study, the cover letter on the administered questionnaire (Appendix A) informed participants the nature of the study and were informed that they had no obligation to participate unless they were willing to do so.

4.8 SAMPLING STRATEGY

In the succeeding paragraphs, the sampling strategy which encompasses criteria used for selection of the population sample (qualifying questions), sampling techniques and the research instrument and procedures were presented. The population is an aggregate of all the objects, subjects or members that conform to a set of specifications through which a sample to conduct a study is chosen (Wiid & Diggines, 2015). The population usually contains too many objects, subjects or members to study conveniently, so an

investigation is restricted to one or more samples drawn from it. Therefore, in order to draw a representative sample from a population, sampling is conducted to choose a population that will contain most of the information of a particular population parameter. Sampling is the process of selecting a group of subjects for a study in such a way that the individuals represent the larger group from which they were selected (Kumar, 2014; Malhotra, 1999; Wiid & Diggines, 2015).

4.8.1 Population and Respondent selection

It is impossible or impractical to collect data from all the people who are the targets of one's research. Therefore, the researcher chooses a representative mirror image of the whole sample. In this study, the population comprised of mobile phone banking users that represent the rest of mobile phone banking users (Creswell, 2014; Dudovskiy, 2016; Flick, 2015; Panneerselvam, 2014). Non-probability sampling was used. Since literature indicates that students are the technology generation and mostly use mobile phones compared to other age groups, students were deemed the appropriate population (Margaryan *et al*., 2011). A convenience sampling technique was used to access large groups of University of Fort Hare students.

It is believed that using convenience sampling is ideal when it is problematic to recognise members of the population. In order to meet the requirements of the sample size to effect use of the structural equation modelling (SEM) (Boomsma & Hoogland, 2001; Hoogland & Boomsma, 1998), a sample of no less than 200 students was used.

4.8.2 Sampling Techniques

According to O'Leary (2004), sampling is a process that is always strategic and sometimes mathematical, which will involve using the most practical procedures possible for gathering a sample that best 'represents' a larger population. Non-probability sampling was used where convenience sampling technique was used. As suggested by the name, convenience sampling involves selecting participants based on availability and willingness. Thus, respondents are selected purely because they are reachable, available and willing to take part in the study. Convenience sampling deals

with taking cases or a population sample that is easily available (Wiid & Diggines, 2013, 2015), which in this study are students at UFH.

4.8.3 Qualifying Questions to identify respondents

In order to ensure that the exact target population was reached, qualifying questions regarding mobile phone banking were used. These questions were answered by respondents in a self-administered questionnaire. The questions which required participants to acknowledge that they met the stipulated criteria for participating in the study were answered at the beginning of the questionnaire. The qualifying criteria included:

- The students had to have at least one bank account with a bank in South Africa.
- The students had to be using either USSD/cellphone banking; MB apps or both.

The qualifying questions aided in the reduction of wasted questionnaires.

4.8.4 Population Sample

The study took place in East London, South Africa where a total number of 300 questionnaires were distributed to students at the University of Fort Hare campuses in Alice, East London and Alice. Only 218 questionnaires were returned fully completed and were then analysed using SPSS and Lisrel. Other questionnaires that had missing background data were discarded. The study required a minimum of 200 questionnaires to meet the requirements to enable and effect the use of structural equation modelling (Boomsma & Hoogland, 2001; Hoogland & Boomsma, 1998).

4.9 RESEARCH INSTRUMENTS AND PROCEDURES

Research instruments refer to devices used to collect data such as questionnaires, tests, structured interview schedules and checklists (Collis & Hussey, 2013; Iacobucci & Churchill, 2010; Kumar, 2014; Singh, 2012). The research instrument used in this survey research is typically a structured or closed-ended questionnaire. A questionnaire is a systematically prepared form or document of inquiry with organised series of questions intended to elicit the information which will provide insight into the nature of the problem, or implore responses from respondents and research informants for the purpose of

collecting data on the research problem under study (Wiid & Diggines, 2015; O'Dwyer & Bernauer, 2014). Closed or structured questionnaires are questionnaires in which some control or guidance is given for the answer (Wiid & Diggines, 2015). The questions are usually short, requiring 'yes' or 'no' responses or checking an item out of the list of given responses. Thus, the respondents' choices are limited to set of options provided.

4.9.1 Research Instrument and Questionnaire Design

Research instruments are defined as tools or medium considered when gathering and measuring data on survey questionnaires, structured interview schedules and checklists. The research utilised a structured self-administered questionnaire. Constructs were measured by a questionnaire containing five-point Likert scales in English that was administered to students.

4.9.2 Measurement and Scales

The questionnaire was measured through a Likert scale with each statement measuring along a 5-point scale in regard to consumer behaviour (i.e. strongly agree=5, agree=4, neither agree nor disagree=3, and disagree=2, strongly disagree= 1). A Likert scale is a bipolar scaling method measuring either positive or negative response to a statement (Beglar & Nemoto, 2014). The respondent is asked to evaluate by giving a quantitative value on any kind of subjective or objective dimension, with the level of agreement/disagreement being the dimension most commonly used. A good Likert scale, as above, will present a symmetry of categories about a midpoint with clearly defined linguistic qualifiers that will behave more like an interval level of measurement. The constructs and associated measurements utilised in this research were modified from numerous empirical studies with high validity and reliability as shown in Table 4.1.

Table 4.1: Measurement scales

RESEARCH SCALES	CRONBACH'S ALPHA
CUSTOMER LOYALTY	Construct reliability (CR) 0.90
I would consider mobile phone banking applications/USSD banking as my first choice for future financial transactions	
I intend to continue doing transactions through mobile phone banking applications/USSD banking site in the future	Adapted from: Aldas-Manzano et al. (2011);
I think that I would recommend mobile phone banking applications/USSD banking to someone who seeks my advice	Parasuraman et al. (2005); Yang & Feng-Shii Tsai, (2007); Zeithaml et al. (1996)
I would encourage friends and relatives to do transactions with mobile phone banking applications/USSD banking	
I think I would say positive things about mobile phone banking applications/USSD banking to other people	
FULFILMENT	Construct reliability (CR) 0.89
Mobile phone banking applications/USSD banking service delivers timely information	
Mobile phone banking applications/USSD banking gives responses for my questions within suitable time	Adapted from: Kim & Nitecki (2014); Parasuraman et al.(2005)
Mobile phone banking applications/USSD banking provides information that I seek	
It provides information that I would like	
It has information about what is going on within the bank	
It is truthful about the information it provides	
It delivers accurate information	
EFFICIENCY	Construct reliability (CR) 0.94
The mobile phone banking application/USSD banking services make it easy to find banking information I need	
The mobile phone banking applications /USSD banking makes it easy to get anywhere on the site	Adapted from: Kim & Nitecki (2014); Parasuraman et al.(2005)
The mobile phone banking applications/USSD banking enables me to complete a transaction quickly	
The mobile phone banking applications/USSD banking has well-organised information on the site	
Mobile phone banking applications/USSD banking loads its pages fast	
The mobile phone banking applications/ USSD banking is simple to use	
The mobile phone banking applications/USSD banking site enables me to get onto it quickly	
The mobile phone banking application/USSD banking is well organised	

SYSTEM AVAILABILITY	Construct reliability (CR) 0.83
My mobile phone banking applications/USSD banking site is always available for banking service	
My mobile phone banking applications/USSD banking launches and runs right away	Adapted from: Kim & Nitecki (2014); Parasuraman et al. (2005)
My mobile phone banking applications/USSD banking site does not crash	
My bank's mobile phone banking applications/USSD banking pages do not freeze after I enter my information	
PRIVACY	Construct reliability (CR) 0.83
Mobile phone banking applications/USSD banking protects information about my browsing pages, clicking links on my banking account	Adapted from: Kim & Nitecki (2014); Parasuraman et al. (2005)
The banking applications/USSD banking does not share my personal banking information with other sites	
The banking applications/USSD banking protects information about my banking card/s	
OVERALL SERVICE QUALITY	Adapted from: Kim (2015); Kim & Nitecki (2014)
Overall quality of the mobile phone banking applications/USSD banking services	
The information and services available on this mobile phone banking/USSD banking	
The extent to which mobile phone banking/USSD banking services gives you a feeling of being in control of what you intend to do	
The overall value you get from mobile phone banking applications/USSD banking service for your efforts	

4.10 DATA COLLECTION AND ANALYSIS

Data collection is the process of gathering and measuring information on variables of interest in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Sapsford & Jupp, 2006). The data collection component of research is common to all fields of study including physical and social sciences, humanities and business. While methods vary by discipline, the emphasis on ensuring accurate and honest collection remains the same.

According to Wiid and Diggines (2015), there are three main types of descriptive data collection methods: observational, case study and survey methods. Of these three, the study used the survey research method. The survey research method allows participants to answer self-administered questionnaires which respondents interpret and answer the questions. The strengths of surveys include their accuracy, generalizability and convenience. Surveys are amenable to rapid statistical analysis and are comparatively easy to administer and manage.

According to Fink (2013), surveys are data collection methods used to describe, compare, or explain individual and societal knowledge, feelings, values, preferences and behaviour. Furthermore, surveys can be described as a structured questionnaire containing formalised questions given to a sample of the population designed to solicit specific information from respondents (Kothari, 2004; Singh, 2012; Wiid & Diggines, 2015; Malhotra, 1999). In the study, the sample population was given questionnaires, who then answered to describe their opinions, views and feelings.

The goal for all data collection is to capture quality evidence that then translates to rich data analysis and allows the building of a convincing and credible answer to questions that have been posed. There are two types of data collected in research, namely secondary data and primary data, which will be explained in the following sections.

4.10.1 Methods of Secondary Data Collection

Secondary data is data collected by someone other than the primary user or information gathered from sources that already exist. It is often collected by the researcher to

scrutinise where the existing data is inadequate in the context of the problem which is under investigation (Sekaran & Bougie, 2013). Secondary data can either be published or unpublished (Kumar, 2014; Wiid & Diggines, 2015).

Published data is available in many different publications, including government publications, international bodies and their subsidiary organisations; technical and trade journals; books, magazines and newspapers; reports and publications of various associations connected with business and industry, banks, stock exchanges; reports prepared by research scholars, universities, economists; public records and statistics; historical documents, and other sources of published information (Kothari, 2004). The sources of unpublished data are many; they may be found in diaries, letters, unpublished biographies and autobiographies and also may be available from scholars and research workers, trade associations, labour bureaus and other public/private individuals and organisations (Sekaran & Bougie, 2013).

This study involved undertaking a comprehensive literature review in order to identify and determine the mobile banking trends and innovations and the history and development of SQ. The outcomes of these are presented in Chapters Two and Three. The secondary data collection was conducted by referring to textbooks, journal articles, magazine articles and conference papers on the related topics. The relevant secondary sources formed the basis for the two proposed hypothesised models. National and international databases were used through Science Direct, Emerald, EBSCOhost, UFH database, as well as searches on Google and Google Scholar.

4.10.2 Method of Primary Data Collection

Primary data refers to data which is collected for the first time through instruments such as surveys and is thus original in character (Sekaran & Bougie, 2013). Primary research underpins the empirical investigation of a study. In other words, primary data is gathered through the efforts of the researcher. This involves selecting an appropriate population, sample frame and sampling techniques, as well as a suitable sample size. In addition, primary research involves the data collection process, administering of the measuring instrument, and the methods of data analysis used in a study. Primary sources of data collection used in quantitative studies are surveys, observations and experiments. After

careful weighing up of the cost and duration of this study as well as objectivity and reliability of collected data, a survey was considered the appropriate primary data collection method.

4.10.2.1 Survey

Surveys comprise collecting data from selected individuals through verbal or written communication. According to Collis and Hussey (2013, p.77), surveys are defined as the "methodology designed to collect primary or secondary data from a sample, with a view to analysing them statistically and generalising the results to the population". The survey was utilised as a primary data collection method due to its merits that outweigh its demerits. Surveys are mainly divided into two categories: questionnaires and interviews (Trochim, 2006). Utilising self-administered surveys ensured that respondents answered at their own convenience, there was no need to set up an interview, and the low cost per completion made it an economical method of surveying a large sample.

4.10.3 Data Analyses

Analysis of data means studying the tabulated material in order to determine inherent facts or meanings through breaking down existing complex factors into simpler parts and putting the parts together in new arrangements for the purpose of interpretation (Blaikie, 2003; Singh, 2012). The collected data is known as raw data which is meaningless unless it is statistically analysed (Collis & Hussey, 2013). Thus, analysing the data gives meaning to it which enables the researcher to draw results after proper preparation. Data analysis serves to make collected data meaningful through testing hypotheses, drawing inferences or making generalisations and estimating parameters (Creswell & Plano, 2011; Iacobucci & Churchill, 2010; Trochim, 2006). In the preceding section 4.10.4, the different aspects of data analysis such specifically descriptive and inferential statistics are discussed.

4.10.3.1 Data preparation

Data preparation involves checking or logging the data into the computer; checking the data for accuracy; transforming the data, and developing and documenting a database structure that integrates the various measures (Trochim, 2006). When the study instrument has been completed and all of the data has been collected, the researcher must prepare the data to be analysed. Organising the data correctly can save a lot of time and prevent mistakes (Iacobucci & Churchill, 2010; Collis & Hussey, 2013).

Most researchers choose to use a database or statistical analysis program (Microsoft Excel, SPSS, and Lisrel) that they can format to fit their needs in order to organise their data effectively. Data preparation includes coding questionnaire responses, keying in and editing data (Sekaran & Bougie, 2013). Thus, in this study, the researcher entered the data into a Microsoft Excel spreadsheet and then later transferred it into SPSS after it was categorised, then handled outliers, inconsistencies and blank responses.

4.9.3.2 Data validation

Following data preparation is the data validation process. The procedure is conducted to further scrutinise, clean and make sure that data adheres to requirements. Data validation is frequently the initial procedure executed on collected data (McDaniel & Gates, 2013). The process of data validation includes data cleaning, also referred to as data scrubbing or cleansing, and managing inconsistencies or errors in the data to increase the quality (Meade & Craig, 2012). Data quality problems exist in particular data collections, often due to misspellings during data recording, misplaced and omitted information, or other void data (Dudovskiy, 2016; McDaniel & Gates, 2013). The following was carried out to ensure data validation: numbering characters in data; checking the accuracy of characters; checking uniformity amongst one data item and others in the same record; checking the accuracy of total records. To ensure data validation the researcher checked patterned responses for whether the responses that were provided were consistent, and checked for typing errors by rechecking that all responses corresponded with the questionnaires.

4.10.3.3 Editing data

Data editing refers to the process involving the critical examination, review and adjustment of collected survey data (Wiid & Diggines, 2013, 2015). According to Sekaran and Bougie (2013), data editing involves identifying illegal (not wanted) responses and amending inconsistencies, dealing with missing values, illogical data and exclusions in responses. An illogical response, for example, is an outlier response. An outlier is a response that is extensively unique from the other responses. The purpose is to control the quality of the collected data. Data editing can be performed manually, with the assistance of a computer or a combination of both (Wiid& Diggines, 2015). The purpose of this section is that cautious inspection and examination of all responses collected increase chances of having data that is error-free, readable and complete.

4.10.3.3.1 Summary missing values

Missing values are certain questions that have been mistakenly omitted by respondents (Wiid & Diggines, 2015). There are different methods of dealing with missing data. Of the different methods that are available, multiple imputation was used. This method of handling missing data decreased chances of having to reduce the sample through discarding all questionnaires that had missing values. The missing values were dealt with through multiple imputation whereby SPSS was used to systematically estimate possible values. There were a total number of 40 missing responses reported from the data as is indicated Tables 4.2 and 4.3.

Table 4.2: Section 'A' mobile app banking

CUSTOMERLOYALTY	FULFILMENT	EFFICIENCY	SYSTEMAVAILABILITY	PRIVACY	OVERALL SERVICE QUALITY
MBL1-0	MBF1-3	MBE1-0	MBSA1-1	MBP1-1	MBQ1-0
MBL2-0	MBF2-0	MBE2-0	MBSA2-2	MBP2-0.	MBQ2-0
MBL3-1	MBF3-1	MBE3-0	MBSA3-1	MBP3-0	MBQ3-0
MBL4-0	MBF4-4	MBE4-0	MBSA4-0		MBQ4-0
MBL5-0	MBF5-1	MBE5-2			
	MBF6-0	MBE6-1			
	MBF7-0	MBE7-0			
		MBE8-0			

Table 4.3: Section 'B' USSD/cellphone banking

CUSTOMERLOYALTY	FULFILMENT	EFFICIENCY	SYSTEMAVAILABILITY	PRIVACY	OVERALL SERVICE QUALITY
USL1-0	USF1-0	USE1-1	USSA1-0	USP1-0	USQ1-4
USL2-0	USF2-0	USE2-1	USSA2-3	USP2-0	USQ2-0
USL3-1	USF3-1	USE3-1	USSA3-0	USP3-0	USQ3-0
USL4-0	USF4-0	USE4-1	USSA4-1		USQ4-0
USL5-0	USF5-1	USE5-0			
	USF6-0	USE6-2			
	USF7-1	USE7-4			
		USE8-0			

4.10.3.4 Coding data

Coding refers to the process of assigning numerals or other symbols to responses so that responses can be put into a number of categories to enable ease when recording data into a database (McDaniel & Gates, 2013; Sekaran & Bougie, 2013). Coding is necessary for efficient analysis and through it, the several replies may be reduced to a small number of classes which are computer-readable (Kumar, 2014; Singh, 2012). Within the study, coding was conducted from the designing stage of the questionnaire. This enabled the researcher to pre-code the questionnaire choices which were helpful for computer tabulation as the data can be recorded from the original questionnaire. Thus for the initial part of the instrument, in order to make sure the computer system could understand the responses, they were given codes (numbers). Codes were assigned for the gender (1=male; 2=female); age (1= 18-25; 2=26-35; 3=36-44), and all the other responses. This enabled the researcher to change the responses to a language that could be simply understood by a computer system.

4.10.4 Descriptive and Inferential Analyses

Descriptive statistical analysis seeks to give a statistical narrative about a specific group being studied and relate whether a match to those outside the group cannot be taken for granted (McDaniel & Gates, 2013). Descriptive statistics describe the data devoid of drawing any inferences which are usually used at a single variable at a time (Trochim,

2006). These statistics inform the investigator on the spread of data on the variable meaning of the regular score of respondents on a particular study measure. Finally, descriptive statistics is utilised to inform the investigator on the regularity with which particular scores or responses arise on a given study measure.

The inferential statistical analysis is the process of selection of part of the population that is anticipated to be representative to estimate characteristics of or patterns in the population from which it is drawn (Blaikie, 2003; Singh, 2012). Inferential statistics permit the researcher to draw conclusions on the collected data and establish whether a pattern or relationship exists in the sample, specifically with reference to the hypothesis under study. This means that while applying inferential statistics to data, the researcher is concluding about the population at large. Inferential statistics seek to generalise beyond the data in the study to find patterns that ostensibly exist in the target population (Trochim, 2006).

4.10.4.3 Reliability and validity

Validity is the extent to which the measuring instrument measures what it claims to measure. Furthermore, it is the appropriateness, meaningfulness and usefulness of specific inferences made from specific test scores. Validity refers to the degree whereby the measuring instrument measures what it claims to measure (Dudovskiy, 2016; Jonker & Pennink, 2010). Collis and Hussey (2013) state that "errors such as faulty research procedures, poor samples, and inaccurate or misleading measurement, can undermine validity" (p.53).

Hair *et al*. (1998) identified rules of thumb for evaluating the practical significance of factor loadings as indicated by either the component coefficients in the case of principal components, the factor matrix (in a single factor model or an uncorrelated multiple factor model), or the pattern matrix (in a correlated multiple factor model). Several suggestions have been passed in relation to cut-off points on factor loadings. Field (2009) supports the proposition of Guadagnoli and Velicer (1988) that to consider a factor as consistent it must have four or more loadings of at least 0.6 regardless of sample size. Stevens (2002) proposes using a cut-off of 0.4, irrespective of sample size, for interpretative purposes. The present study applied the proposition of Hair *et al*.(1998) as well as Stevens (2002) stating that a minimum factor loading of 0.40 is required for a sample

size of 200 and for interpretive purposes respectively. It is impossible to explain or authenticate either validity or reliability without the other.

Reliability is the extent to which test scores are consistent or stable (Dudovskiy, 2016). The researcher tested reliability using Cronbach's alpha. A measuring instrument is considered reliable when it is applied multiple times and consistently yields the same results. In other words, this means that it produces stability (i.e. few differences in scores) (McDaniel & Gates, 2013). The reliability of an instrument is shown by the reliability coefficient. The Cronbach's alpha (CA) is often denoted as 'r' and is articulated as a numeral value ranging between 0 and 1.00, with 'r'= 0 representing no reliability, and 'r'= 1.00 signifying perfect reliability. The higher the reliability coefficient, the more consistent the instrument. The table below serves as a universal standard for inferring reliability. The constructs should not be solely rejected on the basis of the size of its reliability coefficient. The type of test, type of reliability estimate reported, and the context in which the tests conducted should be considered. The generally acceptable value of CA is 0.7 and 0.8. However, owing to the diversity of the constructs being measured between one study and another, Field (2009) suggests that such general guidelines need to be used with cautiousness because the value of the CA coefficient depends on the number of items on the scale.

Table 4.4: Universal standard for inferring reliability

Cronbach's Alpha Coefficients	Interpretation
.90 and up	Excellent
.80 - .89	Good
.70 - .79	Adequate
below .70	May have limited applicability

4.10.4.1 Pearson correlation

Correlation analysis allows statistical techniques to analyse data with more than one variable and shows how strongly pairs of variables are related. Its value is usually between +1 and -1, where a positive correlation shows a perfect direct relationship, zero shows no relationship, and a negative correlation shows a perfect inverse relationship

(McDaniel & Gates, 2013, p.526). Correlation coefficient examines the strength and direction of the relationship between two variables (Wiid & Diggines, 2013, 2015). Thus, Pearson correlation analysis was utilised to test the strength and direction of variables. Due to the need to further identify and estimate the controlling effects of each variable for the other variables, multiple regression was utilised and follows in the subsequent section.

4.10.4.2 Multiple linear regression

Multiple regression analysis is a procedure for predicting the level or magnitude of a dependant variable based on the levels of multiple independent variables (McDaniel & Gates, 2013, p.544). According to Wiid and Diggines (2013, 2015), multiple regression is used when the researcher seeks to conclude on the interrelationship between a specific dependant variable and various independent variables. Owing to its broad applicability, multiple regression analysis has been applied and utilised for different purposes. Although it's well known that multiple regression application falls into two categories, namely prediction and application, the results of this study assisted in predicting the impact of the independent variables on the dependant variable. The succeeding section illuminates on the structural equation model (SEM), specifically partial least squares (PLS-SEM).

4.10.4.3 Structural equation model (SEM)

According to Iacobucci and Churchill (2010), a structural equation model is more of a multiple regression analysis in that several variables are used to predict another variable. This program was used for testing hypotheses, reliability, validity through confirmatory factor analysis, and an advanced multivariate analysis using SEM. SEM was used to test hypotheses and interrelationships as well as validating the research model. The advantage of SEM is that it simultaneously fits components of the larger model and enables the investigator to test all interrelationships at once.

This also enabled the researcher to discover direct and indirect paths among the variables tested (Iacobucci & Churchill, 2010). There are numerous distinct methodologies to SEM: Covariance-based SEM (CB-SEM) is the extensively applied

approach, using software packages such as AMOS, LISREL, EQS and MPlus (Hair, Sarstedt, Ringle, & Mena, 2012; Hair *et al*., 2013; McIntosh, Edwards, & Antonakis, 2014; Wong, 2013). The next method is partial least squares (PLS), which centres on the analysis of variance and can be conducted using PLS-Graph, WarpPLS, Smart LS, and VisualPL (Wong, 2013). The current study used the soft modelling approach to SEM which involves PLS (SEM-PLS approach).

4.10.4.3.1 PLS-SEM

Wong (2013) states that "the PLS-SEM is a soft modelling approach to SEM with no assumptions about data distribution" (p.3). The (PLS-SEM) method to structural equation modelling allows approximating complex cause-effect relationship models with latent variables (Hair *et al*., 2013; Wong, 2013). It is a component-based estimation approach that differs from the covariance-based structural equation modelling (Hair *et al*., 2013; McIntosh *et al*., 2014; Moneck & Leisch, 2012). Unlike the covariance-based approach to structural equation modelling, PLS path modelling does not reproduce a sample covariance matrix. It is more oriented towards maximising the amount of variance explained (prediction) rather than statistical accuracy of the estimates. The PLS-SEM consists of two sub-models: the measurement model and structural model. The measurement model shows the relationships between the observed data and the latent variables. The structural model represents the relationships between the latent variables (Henseler, Ringle, & Sinkovics, 2009). Therefore, the PLS-SEM befits a good substitute to covariance-based SEM (CB-SEM) when the subsequent circumstances are met:

- Sample size is small;
- Applications have little available theory;
- Predictive accuracy is paramount; and
- The correct model specification cannot be ensured.

In spite of usage of a limited number of participants, PLS-SEM has been used in various research projects (Wong, 2013). The PLS-SEM experienced increasing dissemination in a variety of fields in recent years with non-normal data, small sample sizes and the use of formative indicators being the most prominent reasons for its application. Latest

practical literature has stretched PLS-SEM toolbox to accommodate more complex model structures or handle data inadequacies such as heterogeneity (Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014; Hair *et al*., 2013; Monecke &Leisch, 2012). With regards to the circumstances enlisted above, PLS-SEM was considered for evaluation of hypotheses. Reliability and validity analysis are discussed in the following section.

4.10.4.4 Hypothesis testing

In this study, of the two types of hypotheses available, the study tested statistical hypotheses. Statistical hypotheses deal only with the specific problem of estimating whether a relationship found in the sample also exists in the population (Blaikie, 2003). In order to establish whether a relationship exists, two forms of statistical hypotheses are used: the null hypothesis and alternative hypothesis. According to Blaikie (2003), "a null hypothesis states that the relationship does not exist in the population, usually represented as *H*^{0}, while an alternative hypothesis states that a relationship does exist without specifying its form and represented as *H*^{a} "(p. 179).

Testing hypotheses are important because it enables determination of the level of significance (5%) in a population. It means that the level of confidence is 95 per case and level of significance is 5 per case (100-95). Thus if the confidence level is 99%, the level of significance is 1% (100-99). Therefore, as a result, and as a rule of accepting, it should be stated that the significance level (0.05) is the maximum value of probability of rejecting the *H*^{0} for this study. Since the study utilised PLS-SEM model path analysis to accept and reject hypotheses, the minimum of 1.940 *t*-statistics was acceptable (Hair *et al*., 2014; Field, 2009; Hair *et al*., 1998; Hair *et al*., 2013).

4.11 SUMMARY AND CONCLUSION

The chapter presented the overview of research design and methodology. A clear description of research design was provided. The chapter clarified the research paradigm used within the study and the basis for using it. This was followed by the research approaches: qualitative, quantitative and mixed research. Subsequently, the sampling strategy and research instrument were discussed. Thereafter, various

statistical techniques used within the study were discussed as well as the reliability and validity of the instrument.

Therefore, this chapter has delivered an explanation of the course of action used to practically approach the research steps and methods selected to obtain the objectives under study. Chapter Five presents the findings of the study with Chapter Six concluding the study with recommendations and a holistic summary.

CHAPTER 5: RESEARCH FINDINGS

5.1 INTRODUCTION

The previous chapter illustrated the plan which the researcher utilised to collect and analyse data. As indicated in the preceding chapter, surveyed data was collected leading to a quantitative study. The results were generated using Smart PLS, SPSS and Lisrel. In this chapter, the researcher conducts an in-depth discussion of findings of the study.

This chapter will discuss the findings from the output of the 5-point Likert scales contained in the questionnaire answered by respondents. The findings will present descriptive results which consist of the discussion of the sample and the demographic results. This is followed by the inferential statistics results, that is, the reliability and validity results, Pearson correlation, regression analysis and PLS-SEM findings. The group of respondents was divided into three sub-groups consisting of those using Mobile MB apps only, USSD/cellphone banking only, and those using both modes of mobile banking. The presentation of the data will follow a chronological order similar to that used on the questionnaire displayed in Appendix A. This means that the discussion on the findings will initially begin with the demographics before venturing further into the in-depth analysis of the dependent and independent variables of the models.

5.2 DESCRIPTIVE RESULTS

Descriptive results were used to describe frequencies, percentages and tabulations of data regarding the respondents' background information. Within this section, the demographic information on the survey questionnaire is discussed. This section encompasses demographics, mode of mobile banking used, and banks used by respondents.

5.2.1 Demographic Results

In the following sections, the demographics will be discussed in the order in which they were presented on the questionnaire. The age, gender and choice of banks used by students in the Eastern Cape at UFH is presented first. The study made use of convenience sampling in order to select the most available participants and to distinguish between MB app users and USSD users. The qualifying questions were used to

distinguish the rightful sample for the study. These questions were used to eliminate non-prospective respondents who did not use the modes of mobile banking under investigation.

5.2.1.1 Demographic profile of respondents

Table 5.1 shows that the majority of respondents were female students with n=137(62.8%) and n=81(37.2%), male students. In view of the age of the respondents, the majority of students were between 18 to 25 years (n=170) (78%), followed by 26 to 35 years (n=42; 19.3%) and 36 to 44 years (n=4; 1.8%) respectively, whereas ages between 45 and 54 were attributed to only two students (0.9%).

With regard to choice of banks, the findings show that the majority (99) of students banked with Capitec (45.4%), followed by First National Bank with 50 students (22.9%), Standard Bank with 34 students (15.6%), ABSA with 19 students (8.7%), with the least number of students banking with Nedbank, that is 15 students (6.9%).

Table 5.1: Demographic profile of respondents

Variable	Category	Frequency (N)	Percentage (%)
	Male	81	37.2
Gender	Female	137	62.8
	Total	218	100.0
	18 – 25	170	78.0
Age	26 – 35	42	19.3
	36 – 44	4	1.8
	45 – 54	2	.9
	Total	218	100.0
	FNB	50	22.9
	Standard Bank	34	15.6
Choice of bank	ABSA	19	8.7
	Nedbank	15	6.9
	Capitec	99	45.4
	Other	1	0.5
	TOTAL	218	100.0

The succeeding section on the mode of mobile banking indicates the type of banking that respondents selected as their preferred mode.

5.2.2 Mode of Mobile Banking

The findings regarding the mode of mobile banking used by students revealed that of the total 218 students who took part in the study, 100 (45.9%) students used both MB app and USSD banking. Students using just USSD/Cellphone banking was the next biggest group (n=77; 35.3%), followed by students using just MB app (n=41; 18.8%) which is the smallest group. Figure 5.2 shows that fewer students prefer the MB app compared to Cellphone banking (35.3%>18.8%). It is not clear why more students prefer to use both modes of banking rather than either USSD banking or MB app, but this may have something to do with the fact that they are both now easily available on smartphones.

Figure 5.1: Mode of mobile banking
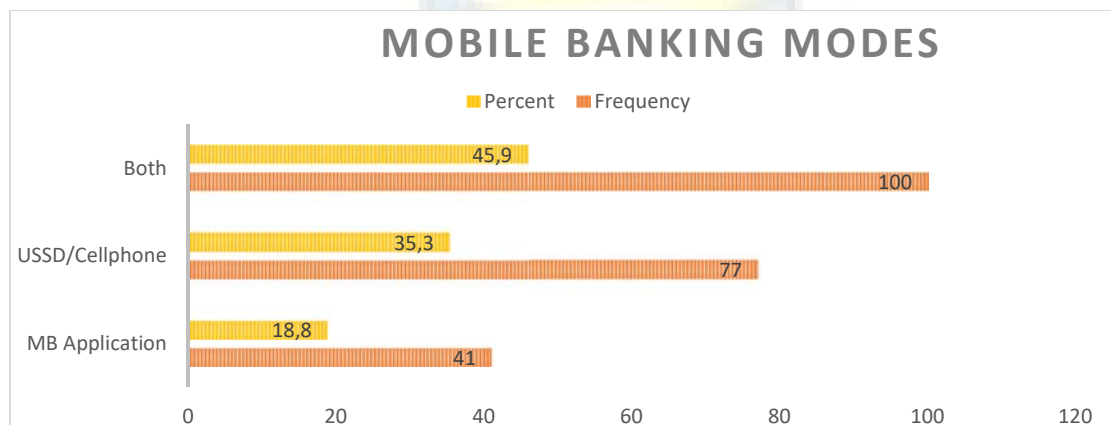
The next section will cover the findings from the inferential statistics by presenting the reliability scores as well as discussing the validity of the scales used. Lastly, the findings related to the models and hypotheses will be presented and discussed.

5.3 INFERENTIAL FINDINGS

As mentioned in Section 4.10.4 Descriptive and Inferential Analyses, inferential statistics allows the researcher to estimate parameters. This is done to establish inferences about the hypotheses on the basis of the data collected and establish whether there is a pattern or a relationship found in the population from which the sample was drawn (Leedy & Ormrod, 2012; O'Dwyer & Bernauer, 2014). This means that while applying inferential

statistics to a sample, the researcher is drawing conclusions about the population at large. The section on inferential analyses discusses results from section 5.5 results of Pearson correlation analysis and regression through to section 5.7 results of partial least squares (PLS) and structural models.

5.4 RELIABILITY AND VALIDITY OF RESULTS

The reliability of the measurement scales was tested using the CA coefficients. It is the ideal method of measuring constructs' stability when using a scale. Thus, the reliability will inform how dependable the data is and how consistent it is in measuring the same constructs time after time (Creswell & Plano, 2011). The findings on the reliability of the various scales are shown in the following sections and their relevant sub-sections: 5.4.1 Item Reliability and Validity of Mobile Banking Application Scales and 5.4.2 Item Reliability and Validity of USSD/Cellphone Banking Scales. The minimum level of CA coefficient commonly considered adequate reliability is 0.7 as recommended by Kim and Nitecki (2014).

As discussed in Chapter Four, validity refers to the degree to which the measuring instrument measures what it claims to measure (Dudovskiy, 2016; Jonker & Pennink, 2010). Collis and Hussey (2013) state that "errors such as faulty research procedures, poor samples, and inaccurate or misleading measurement can undermine validity" (p.53). Factor analysis was therefore used to check the uni-dimensionality of constructs which refers to whether the study's scales were effective in measuring the proposed constructs.

5.4.1 Item Reliability and Validity of Mobile Banking Application Scales

Within this section, item-level reliability and validity analysis will be explained and presented. The independent variable scales to be presented respectively are customer loyalty (MBL), fulfilment (MBF), efficiency (MBE), systems availability (MBSA), privacy (MBP) and dependent variable overall service quality (MBQ). The validity was assessed through conducting a confirmatory factor analysis to establish uni-dimensionality of constructs. The method used enabled the researcher to verify the relationship between the items on the scales used. The linearity of the constructs was determined by factor loadings with readings closely together portraying similarity in the characteristics embedded in the questions used and the character they possess.

5.4.1.1 MB customer loyalty (MBL)

Customer loyalty items were adapted and modified from the scale used by Kim (2015). The five items (**MBL1; MBL2; MBL3; MBL** and **MBL5**) shown in Table 5.2 have been continuously used in several studies around the world (Aldas-Manzano *et al*., 2011; Parasuraman *et al*., 2005). The factor analysis results loaded perfectly with 0.694 portrayed as the lowest loading and 0.866 as the highest loading. These loadings were considered to be sufficiently high above the minimum cut-off of 0.40 thus indicating the scale's validity. Table 5.2 also shows the values of the reliability of the mobile banking customer loyalty scale. These values (coefficient alpha) confirm the uniformity, consistency and dependability of the scale used and the degree to which respondents understood the items of the scale.

The third column: '*CA after Deletion'* estimates what the Cronbach's alpha would be if a particular item is deleted. This also presents the value that the CA coefficient would be if a particular item was deleted from the scale. The second column: Item-Total Corr (*Corrected Item-Total Correlation)* is the correlation between a particular item and the sum of the rest of the items. This indicates how well a particular item relates to the rest of the items. If the '*Item-Total'* is close to zero, the item should be removed from the scale because it is not measuring the same thing as the rest of the items.

In Table 5.2, removal of any item would lead to no improvement in the CA, and the '*Corrected Item-Total Correlation*' values are well above 0.640 indicating interrelation between the scale items. The item-total correlation was within the acceptable range as there is no minimum acceptable value though any value above 0.800 is a problem of multicollinearity. This leads to consideration of all scale items of customer loyalty as they exhibit high correlations and an overall CA coefficient value of 0.872 for the five items on the scale. Therefore, removal of any question would result in a lower CA than that which has been obtained. Therefore, with the results shown in Table 5.2, validity and reliability of the mobile banking loyalty scale are confirmed.

Table 5.2: Validity and reliability of customer loyalty (MBL)

Scale	Scale Items	Cronbach's Alpha: 0.872		
		Factor Loading	Item-Total Corr.	CA after Deletion
MBL1	I would consider mobile phone banking applications as my first choice for future financial transactions.	.720	.670	.855
MBL2	I intend to continue doing transactions through mobile phone banking applications site in the future	.715	.669	.852
MBL3	I think that I would recommend mobile phone banking applications to someone who seeks my advice	.866	.783	.827
MBL4	I would encourage friends and relatives to do transactions with mobile phone banking applications banking	.831	.755	.832
MBL5	I think I would say positive things about mobile phone banking applications banking to other people	.694	.640	.859

5.4.1.2 MB fulfilment (MBF)

All items of fulfilment (**MBF1; MBF2; MBF3; MBF4; MBF5; MBF6** and **MBF7)** loaded together on one dimension as required. The scale confirmed its validity with values above 0.550. The factor loadings of the fulfilment scale ranged between 0 .552 and 0 .789. By investigating the inter-item-total correlation of fulfilment shown in Table 5.3, the correlations of all items are within the overall range between 0.516 and 0.706. The MBF scale correlates at 0.516 or better. By investigating the squared multiple correlations, the results indicate that all items are significantly higher as the rest of the items. Finally, exploring the CA if an item is deleted, the reliability of the scale (coefficient alpha) would show an overall decrease in the value of the scale. Thus, considering the results, it is wise to retain all these items to maintain the overall coefficient alpha of 0.854.

Table 5.3: Validity and reliability of fulfilment (MBF)

Scale	Scale items	Cronbach's Alpha: 0.854		
		Factor Loading	Item-Total Corr.	CA after Deletion
MBF1	Mobile phone banking applications service delivers timely information	.682	.615	.834
MBF2	Mobile phone banking applications gives responses for my questions within suitable time	.667	.616	.833
MBF3	Mobile phone banking applications provide information that I seek	.789	.706	.821
MBF4	Mobile banking applications provide information that I would like	.729	.651	.829
MBF5	Mobile banking applications have information of what is going on within the bank	.552	.516	.853
MBF6	Mobile banking applications are truthful about the information they provide	.678	.624	.832
MBF7	Mobile banking applications deliver accurate information	.674	.628	.832

5.4.1.3 MB efficiency (MBE)

The eight items of the efficiency scale (**MBE1; MBE2; MBE3; MBE4; MBE5; MBE6; MBE7** and **MBE8**) all loaded perfectly as required. Though most of the items were just slightly higher above 0.512, there was consistency in the item loading. The items loaded above 0.512 or better. The highest factor loading was 0.745. Apart from the above, the other interesting fact about the eight items of efficiency is that their loadings were closely correlated showing linearity just like their item-total correlation. Thus with factor loadings above 0.512, the strength of the scale was therefore confirmed. As shown in Table 5.4, the output shows that internal consistency of the scale is 0.820. The items on the scale indicate close correlations ranging between .459 and .628 indicating that they possess similar characteristics. This means that items of the scale will all be retained as they are strongly correlated. Furthermore, deleting an item on the scale will lead to a lower reliability coefficient.

Table 5.4: Validity and reliability of efficiency (MBE)

Scale	Scale items	Cronbach's Alpha: 0.820		
		Factor Loading	Item-Total Corr.	CA after Deletion
MBE1	The mobile phone banking application services make it easy to find banking information I need	.517	.471	.805
MBE2	The mobile phone banking applications makes it easy to get anywhere on the site	.567	.516	.799
MBE3	The mobile phone banking applications enable me to complete a transaction quickly	.512	.459	.807
MBE4	The mobile phone banking applications have well-organised information on the site	.586	.528	.798
MBE5	Mobile phone banking applications loads its pages fast	.519	.465	.807
MBE6	The mobile phone banking application is simple to use	.745	.657	.778
MBE7	The mobile phone banking applications site enables me to get onto it quickly	.654	.573	.791
MBE8	The mobile phone banking application is well-organised	.711	.628	.783

5.4.1.4 MB systems availability (MBSA)

The systems availability construct had only four items (**MBSA1; MBSA2; MBSA3** and **MBSA4**), which all loaded perfectly within the range of 0.565 and 0.807. Thus in regard to validity, all items loaded as required, thereby confirming their fit in the scale. Thus the validity of the scale was confirmed. Items on the systems availability scale all showed consistency and gave an overall alpha coefficient of 0.781. The '*Corrected Item-Total Correlation*' were all well above 0.500 which illustrates close and similar characteristics in the statements used. The internal consistency was measured by four items of the scale and they all showed a reliable alpha coefficient above the minimum required cut-off. Therefore, this means that removal of items will not be required as this would lead to a decrease in the coefficient alpha of the scale.

Table 5.5: Validity and reliability of systems availability (MBSA)

Scale	Scale item	Cronbach's Alpha: 0.781		
		Factor Loading	Item-Total Corr.	CA after Deletion
MBSA1	My mobile phone banking application site is always available for banking service	.565	.509	.764
MBSA2	My mobile phone banking applications launches and runs right away	.661	.573	.734
MBSA3	My mobile phone banking applications site does not crash	.807	.676	.677
MBSA4	My bank's mobile phone banking applications pages do not freeze after I enter my information	.685	.589	.726

5.4.1.5 MB privacy (MBP)

Although the privacy scale had only three items, it proved to have higher factor loadings above 0.650 and with the highest loading of 0.915. These loadings proved the practical significance of the scale thereby confirming validity. The scale loaded perfectly as required regardless of the few items it possesses which could pose a threat if one of the items had not have loaded well. Only three items (**MBP1, MBP2** and **MBP3**) were meant to measure privacy as shown in Table 5.6. Of all the constructs used, privacy had the shortest scale. The items of this scale all showed a good correlation which resulted in the CA coefficient of 0.808. Due to the minimal increase in the reliability alpha, it was decided that item **MBP1** would remain on the scale. Furthermore, it should also be noted that the scale is only three items thus removing one of the three items may affect the validity and overall effectiveness of the scale. As a result of the analysis which resulted in a favourable CA coefficient, all the items on the scale were retained. On all the constructs used, the privacy scale had the least number of items in comparison to other scales used.

Table 5.6: Validity and reliability of privacy (MBP)

Scale	Scale items	Cronbach's Alpha: 0.808		
		Factor Loading	Factor Loading	Factor Loading
MBP1	Mobile phone banking applications protects information about my browsing pages, clicking links on my banking account	.650	.588	.810
MBP2	The mobile banking applications does not share my personal banking information with other sites	.915	.738	.649
MBP3	The mobile banking applications protects information about my banking card/s	.743	.650	.744

5.4.1.6 MB overall service quality (MBQ)

The dependent variable 'overall service quality' consisted of four statements as seen in Table 5.7. The results of factor analysis for the four statements indicated flawless loadings above the required cut-off showing a high degree of practical significance. Table 5.7 shows that loadings ranged between 0.577 and 0.777. Therefore, the validity of the scale was confirmed. As was the case with other constructs, overall service quality exceeded the minimum cut-off for item internal consistency. Results confirmed that the quality scale had a moderately high inter-correlation within its items. Overall service quality returned a '*Corrected Item-Total Correlation*' ranging from 0.516 to 0.644. The scale delivered appropriate and adequate evidence to a high item coefficient alpha with only four items which all were dependable and led to an overall alpha coefficient of 0.784.

Table 5.7: Validity and reliability of overall service quality (MBQ)

Scale	Scale items	Cronbach's Alpha: 0.784		
		Factor Loading	Item-Total Corr.	CA after Deletion
MBQ1	Overall quality of the mobile phone banking applications banking services is high	.577	.516	.766
MBQ2	The information and services available on this mobile phone banking applications is adequate	.644	.572	.740
MBQ3	The extent to which mobile phone banking applications services gives you a feeling of being in control of what you intend to do is high	.777	.644	.703
MBQ4	The overall value you get from mobile phone banking applications service for your efforts	.761	.628	.710

5.4.1.7 Summary of construct level reliability of mobile banking application

At a construct level, the customer loyalty scale proved to be reliable as all items were retained and values were above the required cut-off values as discussed. The values ranged between 0.7 and 0.9 which are all within the required range of reliable values. Although these values showed higher reliability scales, customer loyalty (MBL) showed a little decrease compared to the value presented by previous academics such as Aldas-Manzano *et al*. (2011); Parasuraman *et al*.(2005) and Yang and Feng-Shii Tsai (2007) who adopted and used the same scale.

The other constructs: fulfilment (MBF), efficiency (MBE), privacy (MBP) and system availability (MBSA) also proved to be reliable though they showed a deviation of 0.015 to 0.025 less than the original scales from which these scales were adapted. The findings of reliability on USSD Item level scales were closely related to the ones discussed above and they will be discussed in the following sections. The constructs had the lowest dependability on systems availability (MBSA) (0.781) and the highest for customer loyalty (0.872).

Table 5.8: Summary of reliability on mobile banking app

Constructs	CA Coefficients	N of Items
Systems Availability (MBSA)	0.781	4
Overall Service Quality (MBQ)	0.784	4
Privacy (MBP)	0.808	3
Efficiency (MBE)	0.820	8
Fulfilment (MBF)	0.854	7
Customer Loyalty (MBL)	0.872	5

5.4.1.8 Summary of factor analysis findings on MB app banking

The validity of the scales was confirmed through factor analysis. The scales that were employed in the study were uni-dimensional scales. Uni-dimensional scales are "scales designed to measure only one attribute of a concept, respondent or object" (McDaniel & Gates, 2013,p.305). Table 5.9 illustrates average factor loadings of customer loyalty (MBL), as well as different uni-dimensional scales (fulfilment (MBF), efficiency (MBE), privacy (MBP) and system availability (MBSA)), used to measure e-service quality. These constructs all loaded together as anticipated with total average values varying between

0.601 as the lowest and 0.770 as the highest. Thus, all items indicated higher factor loadings above the minimum required a cut-off of 0.40 as discussed in Chapter four. This shows that there is sufficient evidence for use of the measuring instrument.

Table 5.9: Summary of factor loadings for MB app

Constructs	Range of Loadings	Average Factor Loadings	N of Items
Efficiency (MBE)	.512 - .745	.601	8
Systems Availability (MBSA)	.565 - .807	.680	4
Fulfilment (MBF)	.552 - .789	.682	7
Overall Service Quality (MBQ)	.577 - .777	.690	4
Privacy (MBP)	.650 - .915	.769	3
Customer Loyalty (MBL)	.694 - .866	.770	5

Following this section is the discussion of validity and reliability of the USSD banking constructs.

5.4.2 Item Reliability and Validity of USSD/Cellphone Banking Scales

As indicated earlier, the purpose of this section is to analyse scales that were used in the study. These were used under Section 'B' and the previous section under Section 'A' of the questionnaire. The total item statistics will, therefore, be presented in the similar order to which they were presented in the previous section.

5.4.2.1 USSD customer loyalty (USL)

Customer loyalty for USSD (USL) had five items (**USL1, USL2, USL3, USL4** and **USL5)** which all loaded faultlessly as expected. The items all loaded higher above the minimum cut-off. The factor loadings ranged between 0.729 and 0.858. Therefore, the results indicate practical significance and thereby confirming scale validity. The factor loadings also indicated higher factor loadings compared to those of MB apps.

Customer loyalty revealed higher inter-correlations and outstanding scales with a CA coefficient of 0.884. According to the findings shown in Table 5.10, by investigating the inter-correlation it can be noted that the correlations for all the items are exceptionally high. All the correlations shown in Table 5.10 under the column item-total correlation are either 0.680 or higher. This illustrates that the items possess similar characteristics and

therefore all items will be retained as they lead to a higher CA coefficient of 0.884. The item scales of **USL** proved to be even more reliable compared to the item scale of **MBL** which is possibly due to the sample of respondents. Finally, exploring if an item is deleted will only lead to detrimental effects whereby the scale's reliability will be reduced.

Table 5.10: Validity and reliability of USSD customer loyalty (USL)

Scale	Scale items	Cronbach's Alpha: 0.884		
		Factor Loading	Item-Total Corr.	CA after Deletion
USL1	I would consider USSD banking as my first choice for future financial transactions	.753	.707	.867
USL2	I intend to continue doing transactions through USSD banking site in the future	.771	.720	.859
USL3	I think that I would recommend USSD banking to someone who seeks my advice	.794	.731	.857
USL4	I would encourage friends and relatives to do transactions with USSD banking	.858	.790	.844
USL5	I think I would say positive things about USSD banking to other people	.729	.680	.868

5.4.2.2 USSD fulfilment (USF)

The factor analysis (EFA) reported for the **USF** scale has two clear factors which are important when creating items parcels in the PLS analysis. Parcel creation is based on some form of distinction in constructs, therefore, this split can be deemed useful when specifying parcels for PLS. In line with this, the EFA presented by Kim (2015) on fulfilment showed similar loadings to the one on **USF**. The results presented by Kim (2015) had lower loadings ranging between 0.50 and 0.63. However, the results presented in this study showed higher loadings ranging between 0.610 and 0.888 on the first factor and 0.414 and 0.967 on the second factor.

For the fulfilment (USF) scale shown in Table 5.11, all items revealed strong interrelationships significantly showing a close relationship with values above 0.405. The overall scale shows an alpha coefficient of 0.837. Even though the **USF** scale shows that if **USF5** is deleted, the alteration is not significant as it is only 0.008 from the first run. It would have also caused the second PLS parcel for USF to be reduced from three to two items which is not ideal. Therefore, this leads to a conclusion that all items on the scale will be retained even though **USF5** shows a low inter-correlation from the rest of the items. These results indicate that the scale measuring this factor is consistent and reliable.

Table 5.11: Validity and reliability of USSD fulfilment (USF)

Scale	Scale items	Factor Loading		Item-Total Corr.	CA after Deletion
		1	2		
USF1	USSD banking service delivers timely information	.632	.073	.599	.813
USF2	USSD banking gives responses for my questions within suitable time	.735	.003	.613	.812
USF3	USSD banking provides information that I seek	.888	.097	.672	.801
USF4	USSD banking provides information that I would like	.610	.160	.688	.800
USF5	USSD banking has information of what is going on within the bank	.092	.414	.405	.845
USF6	USSD banking is truthful about the information it provides	-.122	.967	.591	.815
USF7	USSD banking delivers accurate information	.147	.595	.583	.817

Cronbach's Alpha: 0.837

5.4.2.3 USSD efficiency (USE)

It can be seen from Table 5.12 that the USSD efficiency scale had eight items. All the items proved their validity except **USE7** (*The mobile USSD banking site enables me to get onto it quickly*). The item was problematic and was therefore excluded. All the other items ranged between 0.613 and 0.773. Therefore, the new items in the scale were **USE1, USE2, USE3, USE4, USE5, USE6** and **USE8.** CFA was therefore confirmed. Furthermore, findings are shown in Table 5.12 considering the '*Item-Total Correlation'*, the correlation of item **USE7** is below the minimum cut-off with the overall correlation of 0.186, while all other items correlate at 0.434 or better.

The squared-multiple correlations illustrate that again item **USE7** is significantly lower than the rest of the items. In conclusion, by examining the coefficient alpha if deleted, the reliability of the scale (alpha) would increase from 0.646 to 0.842 if the item **USE7** were to be deleted. Thus, to improve the scale dependability, **USE7** was deleted from this scale and the overall alpha coefficient improved from 0.646 to 0.842. This, therefore, means that only seven items (**USE1, USE2, USE3, USE4, USE5, USE6** and **USE8***)* were retained in the scale. With the amendments documented above, the scale was confirmed to be valid and reliable

Table 5.12: Validity and reliability of USSD efficiency (USE)

Scale	Scale items	Cronbach's Alpha: 0.842		
		Factor Loading	Item-Total Corr.	CA after Deletion
USE1	The mobile USSD banking services make it easy to find banking information I need	.645	.500	.595
USE2	The mobile USSD banking makes it easy to get anywhere on the site	.613	.457	.597
USE3	The mobile USSD banking enables me to complete a transaction quickly	.773	.583	.579
USE4	The mobile USSD banking has well-organised information on the site	.724	.512	.595
USE5	Mobile USSD banking loads its pages fast	.532	.434	.604
USE6	The mobile USSD banking is simple to use	.613	.495	.595
USE8	The mobile USSD banking is well-organised	.708	.582	.584

5.4.2.4 USSD systems availability (USSA)

From the results shown in Table 5.13, the availability of the system (USSA) scale has four items (**USSA1, USSA2, USSA3** and **USSA4**). All the items on the scale were consistent as required. The four items indicated practical significance with factor loadings ranging between 0.593 and 0.852. Therefore, with these higher CFA loadings, validity was confirmed. The scale further revealed higher correlations ranging between 0.528 and 0.710. All items in the scale were retained and the decision was brought about by a higher CA coefficient of 0.806. There was no other possible way to help increase the alpha coefficient than the one that was obtained.

Table 5.13: Validity and reliability of system availability (USSA)

Scale	Scale items	Cronbach's Alpha: 0.806		
		Factor Loading	Item-Total Corr.	CA after Deletion
USSA1	My bank's USSD banking site is always available for banking service	.593	.528	.800
USSA2	My bank's USSD banking launches and runs right away	.852	.710	.714
USSA3	My bank's USSD banking site does not crash	.813	.703	.715
USSA4	My bank's mobile USSD banking pages do not freeze after I enter my information	.632	.553	.789

5.4.2.5 USSD privacy (USP)

From the results in Table 5.15, it can be seen that three items (**USP1, USP2** and **USP3)** intended to measure privacy (USP) loaded with ease above all the other scales. The CFA loadings ranged between 0.814 and 0.929. The factor loadings confirmed practical significance as well as the validity of the scale. Compared with the rest of all the other scales, privacy (USP) as shown on Table 5.14 had fewer items which consisted of **USP1, USP2** and **USP3**. All the statements revealed a high correlation with a minimum of 0.618 and a maximum of 0.812. Therefore the internal consistency was measured by the three items, which resulted in a CA coefficient of 0.837. Owing to the number of items in the scale, the higher correlations and the difference between 0.85 and 0.837, the decision to discard **USP1** was not significant as this would lead to a minimal increment of the alpha coefficient by only 0.013. Therefore, all items were retained mainly due to the higher correlations between the items.

Table 5.14: Validity and reliability of privacy (USP)

Scale	Scale items	Cronbach's Alpha: 0.837		
		Factor Loading	Item-Total Corr.	CA after Deletion
USP1	Mobile phone USSD banking protects information about my browsing pages, clicking links on my banking account	.814	.618	.850
USP2	The USSD banking does not share my personal banking information with other sites	.929	.812	.653
USP3	The USSD banking protects information about my banking card/s	.859	.678	.794

5.4.2.6 USSD overall service quality

There were four items (**USQ1, USQ2, USQ3** and **USQ4**) that were used on the overall service quality scale. As expected, the items on the scale loaded very well. The exploratory factor analysis (EFA) loadings ranged between 0.693 and 0.806.These were above the minimum required cut-off. Therefore, the validity of the scale was confirmed. The findings shown in Table 5.15 revealed a higher internal consistency and inter-correlation between the items. The scale showed a '*Corrected Item-Total Correlation*' of 0.627 or higher. This shows that the scale is highly consistent and this led to an overall CA coefficient of 0.839.

The '*Item- Total Statistics'* table presents the '*CA if item deleted*' in the final column, as shown above in Table 5.15 below.

Table 5.15: Validity and reliability of overall service quality (USQ)

Scale	Scale items	Cronbach's Alpha: 0.839		
		Factor Loading	Item-Total Corr.	CA after Deletion
USQ1	Overall quality of the USSD banking services is high	.713	.640	.810
USQ2	The information and services available on this USSD banking are adequate	.806	.714	.777
USQ3	The extent to which USSD banking services gives you a feeling of being in control of what you intend to do is high	.792	.707	.780
USQ4	The overall value you get from USSD banking service for your efforts	.693	.627	.815

5.4.2.7 Summary reliability of USSD/cellphone banking

Cellphone/USSD banking also showed reliable scales within the acceptable range. However, the efficiency scale showed a reliability coefficient of 0.646 on efficiency (**USE**) with eight items. After dropping item seven (**USE7**) which had a higher standard deviation compared to the rest of items on the scale, the reliability exceeded the minimum acceptable range of 0.7. The new coefficient alpha was now 0.844. The reliability of the scales used in this study proved to be highly reliable with all coefficients being above 0.80. Those constructs which had fewer items also revealed high coefficients which proved consistency within the scales. Systems availability (**USSA**) had the lowest score for reliability (0.806) while customer loyalty (**USL**) reported the highest score of 0.884.

Table 5.16: Summary of reliability USSD/cellphone banking

Constructs	Cronbach's Alpha	N of Items
Systems Availability (USSA)	0.806	4
Fulfilment (USF)	0.837	7
Privacy (USP)	0.837	3
Overall Service Quality (USQ)	0.839	4
Efficiency (USE)	0.844	7
Customer Loyalty (USL)	0.884	5

5.4.2.8 Summary of factor analysis findings on USSD banking

The results of factor analysis of customer loyalty (USL) revealed higher factor loadings compared to factor loadings in the preceding section. A total of four items were all retained with factor loadings between 0.729 and 0.858 because they contributed to factor structure and met minimum criteria of having a primary factor loading of 0.40 or above, and no cross-loadings were encountered on the items (**USL1, USL2, USL3, USL4** and **USL5**). The higher factor loadings on both factor analysis of customer loyalty and overall service quality were recommended as they were regarded as very reliable by Kim and Nitecki (2014).

Table 5.17: Summary of USSD factor analysis

Constructs	Range of Loadings	Average	Factor N of Items
Efficiency (USE)	.532 - .773	.580	7
Fulfilment (USF)	.414 - .967	.692	7
Systems Availability (USSA)	.593 - .852	.723	4
Overall Service Quality (USQ)	.693 - .806	.751	4
Customer Loyalty (USL)	.729 - .858	.781	5
Privacy (USP)	.814 - .929	.867	3

The 22-item scale for E-service quality was tested for validity and all factors loaded with high values above 0.40 except **USE7** which had a lower factor loading of 0.248. Item **USE7** did not load above 0.3 and loaded above 0.80 on component 2. Finally, a cross-loading of 0.249 led to item **USE7** being dropped as it caused problems on the scale.

All items in this analysis had key loadings over 0.5. Only one item had a cross-loading below 0.5 (**USE7**); however, this item had a strong primary loading of 0.86 on the second component. This could likely be that the item possesses distinct characteristics to those embedded in the other items that loaded perfectly. The factor labels proposed by Kim (2015), Kim and Nitecki (2014) and Parasuraman *et al*. (2005*)* suited the extracted factors and were retained except **USE7**. Table 5.17 reported that average factor loadings were above 0.58. They were all above the required minimum cut-off confirming the validity of the instrument. In the following section, correlation and regression analysis will be conducted.

5.5 RESULTS OF PEARSON CORRELATION ANALYSIS AND REGRESSION

As discussed in Section 4.10.4.1 Pearson correlation in Chapter Four, the Pearson correlation is used to denote an association that exists between variables which in this study are the independent variable of customer loyalty, fulfilment, efficiency, systems availability, privacy and dependent variable overall service quality. The other technique that is closely related to correlation to be used in the analysis in this section is regression analysis. Correlation describes the strength of an association between two variables in a completely symmetrical manner (McDaniel & Gates, 2013; Wiid & Diggines, 2015). However, regression shows how much y (Overall service quality) changes with any change in x (Customer loyalty, fulfilment, privacy, efficiency and systems availability) (McDaniel & Gates, 2013). Section 4.10.4.2 Multiple linear regression discussed that regression analysis estimates the best straight line to summarise the association between variables.

5.5.1 Pearson Correlation Results for USSD Banking (USSD/Cellphone Banking)

It is interesting to note that the sample provided correlations that are statistically significant and correlating above r=0.30. The results shown in Table 5.18 indicate a meaningful and strong association between variables. As indicated in the table below, the results show that the variables correlated at r=0.348 or higher which show a high positive statistical significance between all variables. Table 5.18 further reports strong correlations between overall service quality (TUSQ) and customer loyalty (TUSL) (r=0.58). Furthermore, significant interrelationships between overall service quality (TUSQ) and fulfilment (TUSF), privacy (TUSP), efficiency (TUSE) and systems availability (TUSSA) are all positive ranging between 0 and +1. Systems availability (USSA) and customer loyalty (TUSL) reported the lowest correlations (r=0.348), followed by privacy (TUSP) and customer loyalty (TUSL) (r=0.399).

The stronger positive correlation was described between efficiency (TUSE) and fulfilment (TUSF) (r=0.752), as well as a fulfilment (TUSF) and customer loyalty (TUSL) (r=0.654). Moreover, strong significantly positive correlations were also witnessed between fulfilment (TUSF) and overall service quality (TUSQ) (r=0.645). Table 5.18 also shows evidence of r-values of 0.446; 0.493 and 0.412 between privacy (TUSP) and fulfilment(TUSF), efficiency (TUSE)as well as systems availability (TUSSA) respectively. All constructs illustrated significantly positive correlations as presented in Table 5.18.

Table 5.18: Pearson correlation coefficient results of USSD banking

Constructs	TUSQ	TUSL	TUSF	TUSE	TUSSA	TUSP
Overall Service Quality (TUSQ)	1.000					
Customer Loyalty (TUSL)	.589 (0.000)	1.000				
Fulfilment (TUSF)	.645 (0.000)	.654 (0.000)	1.000			
Efficiency (TUSE)	.637 (0.000)	.646 (0.000)	.752 (0.000)	1.000		
Systems Availability (TUSSA)	.520 (0.000)	.348 (0.000)	.567 (0.000)	.587 (0.000)	1.000	
Privacy (TUSP)	.537 (0.000)	.399 (0.000)	.446 (0.000)	.493 (0.000)	.412 (0.000)	1.000

5.5.2 Pearson Correlation Results for Mobile Banking Application (MB App)

In a directive to determine the correlations between the dependent variable (Overall service quality) (TMBQ), carefully chosen e-service quality determinants [(fulfilment (TMBF); privacy(TMBP); efficiency(TMBE); systems availability(TMBSA)] as well as customer loyalty (TMBL), Pearson's correlation coefficients were considered. Table 5.20 specifies that most of the constructs significantly correlate with each other above r=0.396 and r=0.655 except MBSA and MBL which had a correlation of r=0.198 which is below the minimum required cut-off. Though the correlation is lower, the results indicate that the MBSA is still significantly correlated (p= 0.009) with MBL, however, the correlation is weak.

From the correlations observed, privacy (TMBP) and overall service quality (TMBQ) exhibited the strongest significant and positive correlation (r=0.655) followed by fulfilment (TMBF) and customer loyalty (TMBL) (r=0.644). All Pearson's moment correlations for the MB app variable relationships displayed significantly positive correlations (p=0.00). Although most of USSD/cellphone banking and mobile banking application variables are statistically significant, the analysis clarified **r**-values describing the linear relationship between two variables from the correlation analysis. The next section on multiple regression enables prediction of the relationship between more than two variables and can be utilised to identify which variables (customer loyalty, privacy, fulfilment, efficiency and systems availability) can predict the outcome variable (Overall service quality).

Table 5.19: Pearson correlation coefficient results of MB app banking

Constructs	TMBQ	TMBL	TMBF	TMBE	TMBSA	TMBP
Overall Service Quality (TMBQ)	1.000					
Customer Loyalty (TMBL)	.501 (0.000)	1.000				
Fulfilment (TMBF)	.552 (0.000)	.644 (0.000)	1.000			
Efficiency (TMBE)	.632 (0.000)	.555 (0.000)	.612 (0.000)	1.000		
Systems Availability (TMBSA)	.485 (0.000)	.198 (0.009)	.448 (0.000)	.490 (0.000)	1.000	
Privacy (TMBP)	.655 (0.000)	.396 (0.000)	.434 (0.000)	.562 (0.000)	.440 (0.000)	1.000

5.5.2.1 Comparison of Correlation findings between USSD/Cellphone banking and MB App

The Pearson correlation analyses revealed that the USSD had a higher correlation for both customer loyalty as well as service quality. From the Tables 5.18 and 5.19, the findings showed that the correlation of customer loyalty (TUSL) and overall service quality (TUSQ) for USSD banking were marginally higher (0.589) than that of MB App (0.501). Similarly, the correlation coefficient of fulfilment (TUSF) and overall service quality (TUSQ) for USSD banking was greater than the relationship of fulfilment (MBF) and overall service quality (MBQ) of MB App (0.645>0.552). The same trend of interrelation was also depicted with efficiency (TUSE) and overall service quality (TUSQ). However, though efficiency (TUSE) and overall service quality (TUSQ) had a higher correlation (0.637), the difference was minimal in comparison to the correlation between efficiency (MBE) and overall service quality (MBQ) (0.632). Systems availability (TUSSA) and overall service quality (TUSQ) also showed a higher correlation of 0.520 compared to 0.485 exhibited between systems availability (MBSA) and overall service quality (MBQ). Though most of the USSD banking constructs indicated higher service quality levels, the privacy of MB App solely indicated that it is more significant on the mobile banking application service quality (0.655) than it is for USSD banking (0.537).

5.5.3 Multiple Regression Analyses for USSD Banking (USSD/Cellphone Banking)

The adjusted R^2 measures the proportion of the total variability in a dependent variable that is explained by the independent variables. The data on USSD banking shows the adjusted R^2= 0.540. This indicates that 54% total variability in overall service quality is explained by privacy (USP), fulfilment (USF), efficiency (USE), systems availability (USSA) and customer loyalty (USL). Furthermore, the adjusted R^2 also specifies that the model of the study has adequate predictability (R^2= 54%). The F-statistics indicate that the model has explanatory power which means that the coefficients are above zero. In other words the model is significant as it has explanatory power with respect to the effect of the independent variables on the dependent variables (p= 0.000). Table 5.20 indicates that privacy (USP), systems availability (USSA), fulfilment (USF), and customer loyalty (USL) contribute significantly to the prediction of overall service quality (USQ), whereas efficiency (USE) does not.

Table 5.20: Multiple regression analysis model summary for USSD/cellphone banking

R=0.553; R^2= 0.540; F= 42.316; p=; 0.000 Std. error of estimate: 1.873			
	B	**Std. error of β**	**p-value**
Overall Service Quality (USQ)			.031
Customer Loyalty (USL)	.221	.052	.003
Fulfilment (USF)	.214	.051	.014
Efficiency (USE)	.133	.052	.130
Systems Availability (USSA)	.151	.055	.024
Privacy (USP)	.226	.070	.000

5.5.4 Multiple Regression Results for Mobile Banking Application (MB App)

The data on MB app shows an adjusted R^2= 0.559. This points towards 55.9% total variability in overall service quality (MBQ) illuminated by privacy (MBP), fulfilment (MBF), efficiency (MBE), systems availability (MBSA) and customer loyalty (MBL). Moreover, the adjusted R^2 of 55.9% points out moderate model predictability. F-statistics (**F**= 36.599) indicates that the model has explanatory power which means that the coefficients are above zero. This translates into the model being regarded as significant as it has

explanatory power regarding the influence of the independent variables on the dependent variables (*p*= .000). Table 5.21 reveals that privacy (MBP), systems availability (MBSA), and efficiency (MBE) contribute significantly to the prediction of overall service quality (MBQ) whereas fulfilment (MBF) and customer loyalty (MBL) do not.

Table 5.21: Multiple regression analysis model summary for MB app

R=.575; **R²**= .559; **F**= 36.599; *p*=.000; Std. error of estimate: 1.709

	B	**Std. error of β**	*p*-value
Overall Service Quality (MBQ)			.113
Customer Loyalty (MBL)	.138	.053	.082
Fulfilment (MBF)	.109	.046	.195
Efficiency (MBE)	.210	.046	.012
Systems Availability (MBSA)	.141	.058	.044
Privacy (MBP)	.373	.078	.000

5.5.4.1 Comparison of regression findings between USSD/Cellphone banking and MB App

The findings of the regression analyses indicate that the model of MB App has a higher prediction capacity compared to that of USSD banking. The findings also revealed some diversification in the results. The regression of the USSD banking model displayed that privacy (USP) is the strongest significant predictor of service quality, with customer loyalty (USL) being second and fulfillment (USF) and systems availability (USSA) occupying third and fourth position in terms of prediction capabilities. Efficiency (USE) proved to be a non-significant predictor of service quality in the USSD model. In Privacy (MBP) was also the strongest significant predictor of service quality in terms of the MB app model. Interestingly however, efficiency (MBE) was the second strongest predictor with availability being the third strongest factor. Fulfillment (MBF) and customer loyalty (MBL) proved to be non-significant predictors of service quality in the MB app model.

5.6 GOODNESS FIT OF THE STRUCTURAL AND MEASUREMENT MODELS

While PLS-SEM does deliver goodness of fit indices of the models, it is often referred to as inaccurate, therefore, has not been included in this set of analyses. Unlike the CBM-

SEM, the PLS-SEM goodness-fit statistics mean something totally different (Hair Jr *et al*., 2014). As suggested by Tenenhaus, Amato, and Vinzi (2004), goodness-of-fit statistics for PLS-SEM focuses on the difference between the observed or approximated values of the dependent variables and the values predicted by the model in question. Though the goodness-of-fit for PLS-SEM has been suggested, research has shown that it is unsuitable for identifying misspecified models (Henseler & Sarstedt, 2013). As a result, the PLS-SEM has been solely used for indicating the model's predictive capability to judge the model's quality (Henseler *et al*., 2014). Henseler and Sarstedt (2012) explain in detail that the global goodness-of-fit for PLS-SEM by Tenenhaus *et al*. (2004) does not represent a fit measure and should not be considered for goodness-of-fit.

5.7 RESULTS OF PARTIAL LEAST SQUARES (PLS) AND STRUCTURAL MODELS

Partial least squares (PLS) is a method for constructing predictive models when the factors are many and highly collinear (Hair *et al*., 2013; Wong, 2013). The data generated using Smart PLS can be used later to discover significant relationships which are then further used to answer hypotheses. The purpose of the PLS model is therefore to test the significance of the model rather than just to discover significant relationships. T-statistics are used to interpret significant and valuable relationships in the path model. According to McDaniel and Gates (2013), a minimum value of 1.960 of *t*-statistics is required to establish significant paths on the model.

5.7.1 PLS-SEM Structural Model for MB Application

The PLS-SEM model below displays significant relationships. It indicates that privacy (MBP) has the strongest relationship (t=4.889), followed by efficiency (MBE) (t=3.192) and fulfilment (MBF) (t=2.440). There is also a strong relationship between the moderator variable overall service quality (MBQ) and customer loyalty (MBL) (t=5.532). As indicated by the model, it suggests that efficiency of MB app banking has a significantly positive relationship with overall service quality of MB app banking (t= 3.192), thereby confirming hypothesis H^{1b}.

Fulfilment of MB app banking and overall service quality of MB app banking also confirmed that hypothesis H^{2b} has a strong, significantly positive relationship (t= 2.440). Furthermore,

the model proves a desirable significantly positive relationship between MB app privacy and MB app overall service quality (t= 4.889). The results, therefore, support H^{3b}. The Smart PLS model further displays that there is a significant positive relationship between MB app overall service quality and MB app customer loyalty. The findings thus endorse H^{5b}.

The findings, however, demonstrate that there is no statistically significant relationship between the independent variable systems availability of MB app and overall service quality of MB App (t= 1.423). This implies that no support was found for hypothesis H^{4b}. Therefore, the existing discoveries validate and support H^{4b0}.

Figure 5.2: PLS path model for mobile banking application

As depicted in Figure 5.2, there are four valuable relationships in the model. Table 5.22 below therefore shows the valuable relationships and decision summary on the hypotheses.

Table 5.22: PLS-SEM path modelling results for MB application

Effective Relation	T-Statistics	Hypotheses	Significant
Efficiency ⟶ E-s-quality	3.192	H^{1b} – Accept	Yes
Fulfilment ⟶ E-s-quality	2.440	H^{2b} – Accept	Yes
Privacy ⟶ E-s-quality	4.889	H^{3b} – Accept	Yes
Systems Availability ⟶ E-s-quality	1.423	H^{4b} – Do not accept	No
E-s-quality ⟶ Customer loyalty	5.532	H^{5b} – Accept	Yes

From what is shown above in Table 5.22, customer loyalty (MBL) of MB App exhibited the strongest path relationship between e-s-quality (MBQ) and customer loyalty (MBL) (t=5.532). Privacy and e-s-quality also indicated strong path value with an overall t-value of 4.889. The path between efficiency and e-s-quality indicated an average t-value of 3.192 followed by a slightly lower t-values of 2.440 between fulfilment and e-s-quality. Systems availability and e-s-quality of MB App presented a weak t-value which was regarded as not significant. The in-depth discussion of the results presented in Table 5.22 will be presented in the succeeding chapter. Table 5.22 shows that there are four significant relationships leading to acceptance of the hypotheses between the following variables:

➢ E-S-quality and customer loyalty
➢ Privacy and E-S-quality
➢ Efficiency and E-S-quality
➢ Fulfilment and E-S-quality

5.7.2 PLS-SEM Structural Model for USSD/Cellphone Banking

As indicated by Hair *et al*. (2012); Henseler *et al*. (2009); McIntosh *et al*. (2014), and Wong (2013), the purpose of the PLS-SEM path model is to facilitate prediction rather than test the theory. The t-statistics will be used to approve the significant paths and relationships on the model. The relationships to be further tested using the PLS-SEM are drawn back from the propositions indicated in the previous chapter.

In line with the research goals, the PLS-SEM model was developed as shown in Figure 5.3. In the PLS-SEM model, the path *t*-statistics are displayed. As discussed in the previous section, for the path to be significant, it must display a *t*-statistical value of at least 1.96 (Hair et al., 2013; Wong, 2013).

Figure 5.3: PLS-SEM path model for USSD/cellphone banking

The PLS-SEM path model illustrates the structural model as well as the proposed hypotheses. The *t*-statistical value for the path concerning USSD efficiency and USSD overall service quality *(t*= 2.289*)* is higher than 1.96 and significant. The relationship between USSD fulfilment and USSD overall service quality has a positively significant relationship and has a *t*-statistical value of 3.231. USSD overall service quality and USSD customer loyalty showed a stronger significantly positive *t*-statistics of *t*=7.763. Moreover, USSD privacy also showed a significantly positive relationship with overall service quality. This was confirmed through a *t*-statistical value of 2.600. Though all the other variables were significant, USSD systems availability and USSD overall service quality were statistically not significant (*t*=1.387) since the *t*-value was below the minimum required a cut-off of 1.960.

Table 5.23: PLS-SEM path modelling results for USSD/cellphone banking

Effective Relation	T-Statistics	Hypotheses	Significant
Efficiency → E-s-quality	2.289	H^{1a} – Accept	Yes
Fulfilment → E-s-quality	3.321	H^{2a}- Accept	Yes
Privacy → E-s-quality	2.600	H^{3a} – Accept	Yes
Systems Availability → E-s-quality	1.387	H^{4a} – Do not accept	No
E-s-quality → Customer loyalty	7.763	H^{5a} - Accept	Yes

Table 5.23 shows that customer loyalty (USL) the USSD banking model displayed the strongest path relationship with e-s-quality (USQ) (t=7.763). Fulfilment (USF) and e-s-quality (USQ) also indicated stronger path co-efficient with an overall t-value of 3.321. The path relationship between privacy and e-s-quality indicated an average t-value of 2.600 followed by a slightly lower t-values of 2.289 between efficiency (USE) and e-s-quality (USQ). Systems availability and e-s-quality presented a weak t-value which was regarded not to be significantly similar to the results of MB App. The in-depth discussion of the results presented in Table 5.23 will be presented in Chapter Six. Table 5.23 showed that there are four significant relationships leading to accepting of the hypotheses between:

- ➢ E-S-quality and customer loyalty
- ➢ Fulfilment and E-S-quality
- ➢ Privacy and E-S-quality
- ➢ Efficiency and E-S-quality

In contrasting the two models for USSD banking and MB app, systems availability does not have a significant relationship with overall service quality which implies that systems availability plays a minor role in e-service quality of mobile banking (USSD and MB app). Customer loyalty was a significant predictor in both models 1 and 2, however, findings indicate that the relationships between customer loyalty (USL) and overall service quality (USQ) of USSD banking was stronger than that of the corresponding relationship in the MB App model. MB App constructs namely: privacy (MBP) and efficiency (MBE) presented higher t-values compared to those corresponding relationships in the USSD banking model. With regards to USSD banking, the fulfilment (USF) construct revealed a significantly higher t-value than the t-value recorded for the MB App model. The in-depth

discussion of the comparison will be conducted in Chapter Six.

5.8 SUMMARY AND CONCLUSION

This chapter presented and the results of the statistical analyses of the study conducted through using SPSS, Lisrel and Smart PLS-SEM. The results were compiled from different analytical methods, specifically factor analysis, reliability, correlation analysis, multiple regression analysis and structural equation modelling through PLS-SEM analysis. The following chapter, Chapter Six, presents the interpretation of the findings from Chapter Five together with recommendations for marketing practitioners and future research in the field of mobile banking.

CHAPTER 6: RECOMMENDATIONS AND CONCLUSIONS

6.1 INTRODUCTION

Chapter Five provided the myriad of findings contained for this project. The descriptive and inferential results were presented. These included discussion of the demographic results, validity, reliability, Pearson correlation, regression analysis and PLS-SEM findings. This chapter will discuss the research propositions and conclusions in greater depth. The chapter begins with an overview of the research, discusses the demographics of the sample, describes the implications of the research and the limitations, draws conclusions and discusses the recommendations for further research.

The fundamental aim of this study was to explore *mobile phone banking: A comparison of e-service quality and customer loyalty*. In a bid to achieve that objective, it was crucial to determine what role mobile banking application and USSD banking play in terms of e-s-quality and customer loyalty and comparing which of the two has a greater influence on e-s-quality and customer loyalty. To do this it is essential to understand E-S-QUAL and its possibility in aiding customer loyalty. This study adds to the body of literature and creates new understandings of these theoretical constructs. Furthermore, a model is proposed which links SERVQUAL with customer loyalty.

6.2 OVERVIEW OF THE STUDY

In the opening chapter, the introduction and background of the study were presented. The analysis of the literature was conducted in Chapters Two and Three presenting the evolution of technological adoption in SA's banking industry and the development of the conceptual models respectively. The research hypotheses presented in Chapter Four were tested using PLS-SEM. The primary objective of the current study was to compare the effect of overall service quality of USSD banking versus MB apps in relation to customer loyalty. To address this using the results presented in Chapter Five, the point of discussion in this chapter will focus on the secondary objectives of the study which include:

➢ To compare the efficiency of USSD banking and mobile phone banking applications in relation to perceived overall service quality.

- To compare the fulfilment of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
- To compare the privacy of USSD banking and mobile phone banking applications in relation to perceived overall service quality.
- To compare the system availability of USSD banking and mobile phone banking applications in relation to perceived overall service quality.

Chapter Six proceeds with a brief recapitulation of the demographics of the respondents who participated in the study. Section 6.4 concludes the overall reliability and validity analyses of the study with Section 6.5 containing the final conclusions pertaining to the hypothesised models.

6.3 CONCLUSIONS REGARDING DEMOGRAPHICS

The demographics presented in Chapter Five showed that there were more female respondents (n=137 (62.8%)) than male respondents (n=81 (37.2%)). It may simply be that more questionnaires were distributed to female respondents than males, or perhaps that more women are using technology for mobile banking and other daily activities as was found in a previous study (GSMA, 2015).

The findings on age distribution are to be expected when sampling a student population. As was previously discussed, students are more likely to use mobile banking technology because they are at the forefront of technological innovation and are constantly looking at improving their technical knowledge (Govender and Sihlali, 2014). The findings also indicated that most students use both USSD/cellphone banking and MB app as opposed to just one or the other. This may be because students are living away from home and need to have convenient methods to send money to and from relatives (Mlitwa and Tshetsha, 2012).

The results also showed that the majority of students at the University of Fort Hare use Capitec Bank, which may be linked to Capitec's low bank charges, although this was not verified in the study.

6.4 CONCLUSIONS REGARDING OVERALL RELIABILITY AND VALIDITY ANALYSIS

Validity and reliability analysis were conducted through Lisrel, SPSS and Smart PLS. to verify the consistency and dependability of the scales.

6.4.1 Conclusions on USSD/Cellphone Banking Validity and Reliability

In previous studies, the e-service quality dimensions have been shown to be consistently valid and reliable (Kim, 2015; Kim & Nitecki, 2014; Parasuraman *et al*., 2005). This study showed similar results, although two scales, efficiency and fulfilment, initially showed lower CA scores than the others. As a result, the problematic items of those scales were removed, and the re-test reliability of both these scales was then improved to acceptable levels. The loyalty constructs in the current study was also shown to be reliable, with a Cronbach's Alpha score above 0.7.

6.4.2 Conclusions on MB Application Item Validity and Reliability

In the factor analysis of the loyalty and e-service quality scales, all items loaded as expected and were within or above the minimum required range of values. The scales all also showed good Cronbach's alpha scores (above .8) and were therefore accepted as reliable. The following section discusses the model and hypotheses.

6.5 FINAL CONCLUSIONS ON THE MEASUREMENT MODELS

Though the sample exceeded 200 for USSD banking, the sample for MB App obtained a sample size below 200 leading to the usage of PLS-SEM. Due to this the PLS-SEM analytical technique was used to verify and quantify the significant relationships. The relationship amongst the variables was analysed and evaluated through *t*-statistics. Four sets of path relationships in both the USSD/cellphone banking (Overall service quality **USQ** and fulfilment **USF**; efficiency **USE**; customer loyalty **USL**; privacy **USP**) and MB application (Overall service quality **MBQ** and fulfilment **MBF**; efficiency **MBE**; customer loyalty **MBL**; privacy **MBP**) had positively significant relationships which had values greater than 1.960. The path co-efficients between overall service quality and customer loyalty in both models had very strong positively significant values (*t*-values over 5.000). Although the path co-efficient for USSD banking was substantially higher than that

achieved for MB app banking. An in-depth discussion on the relationships observed will be discussed next.

6.6 DISCUSSION OF HYPOTHESES AND RESEARCH OBJECTIVES

The discussion on the hypotheses is divided into two distinct sections: one for USSD/cellphone banking and one for the MB app banking. The proposed hypotheses will be discussed and following this section will be a comparison of which mode of mobile banking is preferred by students at the University of Fort Hare. The model indicated that of the ten proposed hypotheses, eight indicated positively significant relationships which resulted in the acceptance of eight alternate hypotheses. The model's relationships are presented below.

6.6.1 Discussion of Secondary Objectives and Hypotheses

6.6.1.1 To compare the efficiency of USSD banking and mobile phone banking applications in relation to perceived overall service quality

The t-statistics value of USSD efficiency (**USE**) and overall service quality (**USQ**) was greater than the minimum recommended t-value (t= 2.289). The findings of the analysed data proved that a statistically positive correlation exists between USSD efficiency (**USE**) and *overall service quality* (**USQ**). The suggested association between USSD efficiency (**USE**) and overall service quality (**USQ**) was therefore supported.

Comparatively, the efficiency construct was adapted to reflect the degree to which the MB app platform allows ease of use when browsing or performing a transaction. The results from the PLS-SEM model (t=3.192), multiple regression (p=0.012) and Pearson correlation (p=0.000) simultaneously proved that there is a significantly positive relationship between MB app efficiency and overall service quality of the MB app.

Previous studies (Kim, 2015; Kim & Nitecki, 2014; Parasuraman *et al*., 2005; Zeithaml *et al*., 2002) also confirm these findings. As suggested by Kim (2015), the efficiency of USSD/cellphone banking plays a critical role in the provision of overall service quality and therefore also on customer loyalty (Kim, 2015; Kim & Nitecki; 2014 and Parasuraman *et al*. 2005).

With regard to the discussion above, the higher *t*-values show that the efficiency of MB app is more critical to customers compared to that of USSD/cellphone banking. The findings indicate that customers are more concerned with how easy and efficient the MB app interface is to use. It may indicate that customers expect to be able to complete transaction easily and without hassles when on the MB app platform. It is possible that consumers are used to the limitations of USSD/cellphone banking and perhaps don't expect these to have the same functionality as the MB app. Therefore, banks should focus on improving efficiency specifically of the MB apps and should make available simple features and means of getting onto the application or site. Customers might resent using either of these mobile technology options if they possess challenging or complex interfaces, but their expectations of the MB app are higher than those for the USSD/cellphone banking technology. The time period that one has to wait until one is on the application or site is also significant. Continuous upgrade of the app and systems facilitating efficiency should be a bank's priority. The language on the MB app should also be made very simple and clear, with fewer steps needed in order to complete the transaction.

6.6.1.2 To compare the fulfilment of USSD banking and mobile phone banking applications in relation to perceived overall service quality

These results are similar to those of other studies (Blut *et al*. (2015); Parasuraman *et al*. (2005) and Zeithaml *et al*. (2002)) where a significant positive relationship was found. A *t*-statistical value of 3.231 was found when testing for a relationship between USSD fulfilment (**USF**) and overall service quality (**USQ**). This is a sign of a significant positive relationship and shows that the corresponding alternate hypotheses were supported. Though the scale from which the construct was adapted needed some work in the factor analysis process, (Kim, 2015) the significant relationship showed that this did not present an issue. The literature available on Internet banking and other banking disciplines indicates that fulfilment plays a central role in overall service quality.

Fulfilment of MB apps and overall service quality displayed a PLS-SEM path (*t*= 2.440) which revealed a significantly positive relationship which was also shown in the Pearson correlation analysis (*p*= 0.000). However, the multiple regression analysis disclosed somewhat contradicting results. It presented a positively non-significant value far above the maximum *p*-value (*p*= 0.195). The reason for this contradiction is not clear. Basing

the final judgement on the PLS-SEM model and Pearson correlation coefficients, hypothesis 2^b was supported.

Previous studies conducted in different contexts have also verified the relationship between fulfilment and overall service quality (Parasuraman *et al*., 2005; Tsourela, 2015). In relation to the suggestion confirmed by both results from this study and literature, it can be concluded that fulfilment of MB app (**MBF**) and overall service quality of MB app (**MBQ**) are significantly positively linked.

Banks, marketers and practitioners have to consider simplicity to ensure that customers receive and execute the commands they place on both USSD/cellphone banking and MB app. Customers require a simple interface allowing them to conduct transactions as quickly as possible without bottlenecks. It is also important that customers can access the specific information that they are looking for from both modes of mobile banking. To improve customers' understanding of the information, marketers could also consider a range of different languages to target groups of foreign or uneducated customers. It could be hard for customers with a limited background in English to maximise the service they receive from USSD/cellphone banking and MB app. Enabling the usage of different languages will allow banks to also cater for the international population that does not use English as a first language. This would enable customers from anywhere around the world to execute and get the most fulfilment from mobile banking. It can be concluded that promptness is a concern to customers using mobile banking, and banks should facilitate innovative apps and sites that swiftly enable logging in and browsing.

6.6.1.3 To compare the privacy of USSD banking and mobile phone banking applications in relation to perceived overall service quality

As with the other variables discussed above, privacy (**USP**) and overall service quality (**USQ**) displayed similar patterns that were also found by Kim (2015), Kim and Kang (2012) and Tsourela (2014). The construct showed a strong positive *t*-statistics value of 2.600. Though the study by Kim and Kang (2012) used trust and security to depict privacy, the results confirm overall that privacy plays a critical role in the usage of mobile phones for banking. In an enquiry piloted by Wahab *et al.* (2011), it was confirmed that privacy is critical to customer retention of mobile usage. Parasuraman *et al*. (2005), however, presented contradicting results to the ones discovered in this study and that

of their investigation on Amazon.com and Walmart.com websites through surveys. Since these websites were not closely related to the mobile banking industry, this could be the possible reason why the significance differs between the two studies.

With the increase in the use of mobile technology as well as mobile hacking, privacy has become one of the customers' major concerns especially online and in relation to electronic devices (Subsorn & Limwiriyakul, 2012; Wahab *et al*., 2011). In the study with regard to MB app privacy relationship to overall service quality, the analysis showed a significant relationship. The PLS-SEM path model (t=4.889), multiple regression (p=0.000) and Pearson correlation (p= 0.000) all confirmed a positively significant relationship between MB app privacy and overall service quality. The findings confirm the conceptual relationship suggested in the literature (Kim, 2015; Parasuraman *et al*., 2005; Subsorn & Limwiriyakul, 2012; Tsourela, 2014; Wahab *et al*., 2011). Following the discussion presented above, it is clear that MB app privacy affects overall service quality of MB apps. Therefore, hypothesis 3[b] is supported.

From the hypotheses findings, it can be noted that privacy of MB app (4.889) outweighs that of USSD/cellphone banking (2.600). Privacy plays a critical role in mobile banking. Banks and practitioners alike need to consider innovative means of guaranteeing the safety of customers' information, passwords and fraudulent activities on their MB apps and USSD/cellphone banking sites. Apart from using fingerprint scans and passwords, banks can further include voice recognition access controls, constant updating of customer passwords, and eye scanners as passwords. These could help guarantee privacy and safety of customers' accounts. The use of passwords though convenient when logging into a bank account can be replicated easily by means of hacking. Therefore, both passwords and fingerprint scans and voice recognition can be used to improve privacy as well as pledging safety. Customers require consent in order for their banks to pass on information regarding their details. With marketing being the goal of every company, customers are concerned with how banks keep their personal details.

6.6.1.4 To compare the system availability of USSD banking and mobile phone banking applications in relation to perceived overall service quality

The results indicated that no significance was found between systems availability (**USSA**) and overall service quality (**USQ**). The model indicated a path showing 1.387 *t*-

statistics value below the minimum required value. Therefore, the hypothesis was not supported by the findings. The value of the t-statistics (1.387) shows that there is little effect of systems availability (**USSA**) on overall service quality (**USQ**). The findings, therefore, do not support hypothesis 4[a] which suggested that system availability of USSD banking has a significantly positive relationship with service quality of USSD banking. Recent studies have paid much attention to the relationship between systems availability (**USSA**) on overall service quality (**USQ**). This has been noticed in studies conducted by Kim (2015) and Tsourela (2014) where systems availability (**USSA**) and overall service quality (**USQ**) presented strong interrelationships.

Although the literature has indicated that there is a relationship between **USSA** and **USQ,** the current study sheds light that no relationship exists between these two in the context of mobile banking. Furthermore, this idea also contradicts the findings brought forward by the pioneers of the E-S-QUAL model. In their study of multiple-item scale for assessing electronic service quality, Parasuraman *et al*. (2005) also brought forward the same proposition that there is an agreement between systems availability (**USSA**) on overall service quality (**USQ**). Hence in the current study, it seems apparent that there is no significant relationship between systems availability (**USSA**) and overall service quality (**USQ**).

Systems availability of MB app was also found to have no significant relationship with overall service quality of MB app. The results from the PLS-SEM path model presented a non-significant t-statistics value (t=1.423). Though the PLS-SEM path model was not significant, the Pearson correlation indicated a significant relationship (p=0.000) as well as the multiple regression analysis. System availability findings show fascinating results. Aforementioned studies (Kim, 2015; Parasuraman *et al*., 2005; Tsourela, 2014) have mostly specified that a relationship exists between system availability and overall service quality. However, the current study exhibited a more complex relationship between the variables. Therefore, the findings pose a question on the correct technical functioning of the MB app and its effect on overall SQ.

Systems availability of mobile banking proved not to be significant for both USSD/cellphone banking and MB app. Technical interruptions such as freezing interfaces and delays in executed transactions can reduce customer loyalty as well as

dependence on mobile banking. Standby staff should be available to deal with all technical problems as this could help improve service delivery. Competent software engineers should be available to deal with any problems related to banking software as delays caused by system availability might lead to loss of repeat customers. Parasuraman *et al*. (2005), however, clarified that banks have no control over the performance of this dimension and devices used at the customer's end (Internet connection and mobile phone). Therefore, systems availability is the customers' responsibility.

6.6.1.5 To compare the effect of overall service quality of USSD banking versus mobile phone banking applications in relation to customer loyalty

Overall service quality was found to have a positively significant interrelationship with customer loyalty. Parallel to the PLS-SEM model t-statistics, the p-value from the multiple regression and correlation analysis was highly significant. The size of the t-statistics (7.763) exhibited that there is a relatively strong significant positive relationship between overall service quality of USSD and customer loyalty of USSD. This substantiates hypothesis 5[a], specifically that overall e-service quality of USSD banking has a significantly positive relationship with customer loyalty.

Studies have specifically proved that the better the perceived overall service quality and satisfied customers are, the higher the possibility of customer retention and loyalty (Kim, 2015; Meyer, 2015; Ojo, 2010; Rauyruen & Miller, 2006; Shanka, 2012; Wahab *et al*., 2011; Yu, 2009; Zehir *et al*., 2014).The results, therefore, prove that customer loyalty can be built through securing overall service quality among students at the University of Fort Hare. Having discussed hypotheses on USSD/cellphone banking, the discussion on MB app follows.

The provision of overall service quality has been previously confirmed to have a relationship with customer loyalty also regarded as customer retention in other studies (Aldas-Manzano *et al*., 2011; Parasuraman et al., 2005; Tsourela, 2014; Yang & Feng-Shii Tsai, 2007; Zeithaml *et al*., 1996). The current study shares parallel sentiments to the one presented in the literature. The findings indicated that there is a significantly positive relationship between overall service quality and customer loyalty.

The PLS-SEM path model displayed a 5.532 *t*-statistics value while the Pearson correlation also showed a coefficient value of 0.501 (*p*=0.000). Referring to the findings above, support is drawn for hypothesis 5[b]. Following this section will be a comparison of the results between MB app and USSD/cellphone banking.

Relatively, overall service quality in USSD/cellphone banking proved to have more influence on customer loyalty. Practitioners should consider investing more in the development and innovation of USSD as it has high capability to encourage customer retention. The ability to use the service through only registering with the bank without having to download an application might be the reason why most customers prefer its service than MB app. In order to improve market share, banks should engage in educating customers on MB apps and USSD/cellphone banking. Therefore, banks need to work towards improving fulfilment, privacy and efficiency as these are critical to overall service quality as well as customer loyalty

6.7 COMPARISON SUMMARY OF USSD/CELLPHONE BANKING AND MB APPLICATION FINDINGS

The models conceptualised in the study exhibited remarkable facts in relation to MB app and the USSD/cellphone banking. According to Parasuraman *et al*. (2005) and Tsourela (2014), fulfilment and efficiency presented relative importance compared to the other constructs. The study showed peculiar results from both models. In terms of reliability and validity, MB app displayed lower consistency and factor analysis coefficients. The average range of validity coefficients for MB app ranged from 0.601 to 0.770. whilst that for USSD/cellphone ranged from 0.58 to 0.867. Furthermore, the PLS-SEM path models demonstrated that fulfilment and privacy were comparatively important for USSD/cellphone banking and privacy and efficiency for MB app in the two models. Although the privacy construct was important in both models, the strength of the *t*-statistics was relatively stronger for the MB app. Apart from the above, the privacy of MB app was higher (4.889) compared to that of USSD/cellphone banking (2.600). Conversely, fulfilment also proved higher *t*-statistics value and significance for USSD/cellphone banking (3.321) compared to MB app (2.440). In addition to the above, efficiency showed that it was stronger on the model of MB app (3.192) than for USSD/cellphone banking (2.289).

In relation to the model's effect on customer loyalty, USSD/cellphone banking unveiled higher *t*-statistics compared to MB app. USSD/cellphone banking displayed that overall service quality was higher (7.763) compared to 5.532 t-value of MB app. All uni-dimensional scales indicated they have a relationship with customer loyalty as presented in Chapter Five.

6.8 RECOMMENDATIONS FOR FUTURE RESEARCH AND LIMITATIONS

This section of the study concentrates on the need to deliver guidance for future research, specifically those seeking to compare the effect of overall SQ of USSD banking versus mobile phone banking applications in relation to customer loyalty. In order to fully provide direction for future research, limitations of the current study need not be disregarded. Therefore, some limitations of the study will be discussed subsequent to recommendations of the study.

6.8.1 Recommendations for Future Research

The study was conducted using a population sample of students. The use of students as the core respondents of the research on a study like this needs to encompass a fair proportion of individuals from all ranges of age groups. Future studies could also include a fair proportion of different age groups. Govender and Sihlali (2014) also shared the same conception that though the youth are majorly familiar with the technology, future studies could also check factors influencing students in their usage of either mode of mobile banking.

Secondly, prospective research on young adult people could also be conducted at a national or international level (Nyeko *et al*., 2014). According to Balakrishnan and Raj (2012), the use of solely University students on a critical study like this could limit its applicability and generalisation to the general population. Apart from the above, conducting such studies in different cities across South Africa could also improve the applicability since there are diverse cultures in SA. Zhao *et al*.(2002) confirm that the SERVQUAL applicability across different cultures is an issue. Therefore, future research in different cities nationally on mobile banking modes could differ in relation to their cultural values.

In order to fully maximise the data collected from the population, Govender and Sihlali (2014) suggest that mixed research method (qualitative and quantitative research) can be ideal to solicit the opinions of respondents. The questions such as why most students at the University of Fort Hare preferred a specific bank, as well as their preference for either USSD/cellphone banking, MB App or both, could be answered.

Mobile banking is used across an assortment of demographic groups. Even though studies have been conducted thoroughly on demographic profiling on the usage of mobile phones by university students (Balakrishnan & Raj, 2012), future studies in the SA context may focus on samples with different demographic profiles. The demographic patterns in relation to different modes of mobile banking still need to be ascertained as well as key uses across these profiles. Therefore, the study in this area could help elaborate on USSD/cellphone banking and MB app more broadly in comparison to the current study.

Future research could possibly contrast other forms of banking such as internet banking with mobile banking in order to determine the resultant effects on customer satisfaction and loyalty. The following section will outline the limitations of the study as indicated in the previous section.

6.8.2 Limitations of the Current Study

It is imperative to narrow the scope of the study and draw boundaries. The current study had the following limitations:

➢ The use of convenience sampling of university students located in the Eastern Cape reduces the generalisability of the study and thus possibly leads to bias in the study results. The bias of the results can emanate from three distinct sources, namely; the use of convenience sampling, the use of university students as the sample and the fact that the students all originated from one university and reside in one province in South Africa. However, sufficient motivation was provided for the use of university students as the sample in the dissertation. Further, resource constraints limited the usage of a larger, wider-spread sample.

➢ Although everyone professed to understand the English language, it could pose as a barrier and lead to respondents answering the questionnaire without a clear

understanding of the statements. The use of English, therefore, becomes a barrier since some respondents are hesitant to indicate if they do not understand.

➤ The use of quantitative research decreases the chances of understanding the mobile banking users' opinions and perceptions about the in-depth issues concerning modes of mobile banking as indicated by Govender and Sihlali (2014).

➤ The usage of self-administered questionnaires is problematic as the researcher has no control over some respondents who tend to give expected answers or pattern responses to questions. Wahab *et al*. (2011) found that this usually leads to a reduction of sample population or bias on the results.

Regardless of the several limitations acknowledged, in the preceding section the findings of the present study provides a contribution to present body of knowledge on mobile banking, specifically USSD/cellphone banking and MB app.

6.9 CONTRIBUTIONS AND IMPLICATIONS OF THE STUDY

The study presents different contributions both to the banking sector as well as academia. The research provides practitioners with valuable information that is currently scarce and inadequate on USSD/cellphone banking and MB app. No literature is currently available to show the comparison of SQ offered by these two modes of mobile banking. The current study illuminates the effect of USSD/cellphone banking and MB app's overall service impact to customer loyalty. As this part shows the contributions of the study to develop our understanding of the mobile banking modes, the findings present numerous significant implications for practitioners.

Fulfilment, privacy and efficiency are the most fundamental and correspondingly essential facets of USSD/cellphone banking and MB app. Of the four e-S-QUAL measurements of USSD/cellphone banking and MB app, the three exhibited the strongest influence on both overall service quality and customer loyalty. It is obvious that banks need to place additional prominence on the USSD/cellphone banking and banking application features relating to the three dimensions. In this regard it is noteworthy that efficiency features to deal with simplicity and quickness of getting into applications and USSD customer's interface; essentially all the fulfilment aspects concern the site's

assurances about commands or directives. Therefore, attaining a loyal clientele base for the bank's USSD/cellphone banking and MB app comprises more than crafting a brilliant façade for the application or USSD site. Banks could also enable mobile phones to have a speed point access for electronic funds transfer where customers can swipe cards for payment from other people.

Privacy was also critical of the four e-S-QUAL dimensions presented on multiple regression, Pearson correlation and the PLS-SEM model. Even though Wolfinbarger and Gilly (2003) argued that privacy may not be fundamental, they also debated that experience may alleviate concerns about security/privacy. The emphasis on previous studies (Parasuraman *et al*., 2005; Wahab *et al*., 2011) presented sufficient evidence coupled with consistency in the current study's findings that privacy does affect overall service quality and customer loyalty. Therefore, banks should continue to be innovative to reassure customers through designing clues and reminders indicating privacy of MB apps and USSD/cellphone banking sites. Furthermore, other features such as voice recognition can be used to improve the security of MB apps and USSD/cellphone banking.

The systems availability aspect of USSD/cellphone banking and MB app is not an essential contributor to overall service quality as well as customer loyalty. As indicated by Parasuraman *et al*. (2005), features that comprise system availability suggest that banks do not have control over the performance of this dimension and devices used at the customer's end (Internet connection and mobile phone). Banks should, therefore, dedicate time and money to the other aspects of SQ that positively influence customer loyalty.

The findings suggested that customer loyalty (USL) and overall service quality of USSD banking exhibited stronger relationship compared to the influence between customer loyalty (MBL) and overall service quality (MBQ) of MB App. These findings imply possible factors which banks might need to cater for to improve customer retention through MB App. The usage of internet through the banking application might be the reason why customer retention on MB App is low. It seems customers cannot bear the cost of being connected to their banks through the banking application. Therefore, in order to improve customer retention of MB App, banks should consider implementation of free access Wi-Fi hotspots to cater for customers who might need to connect to the

bank through the banking application. Furthermore, banks should further consider allow free MB App access similar to the same medium used through USSD banking. This could aid in improving both customer retention as well as the number of transactions executed every year.

Banks need to consider that majority of students in South Africa are from rural backgrounds. This means that there is still a large market segment that is unbanked so to speak. Banks could take advantage of students in institutions to register for a bank account as well as USSD/cellphone banking and MB app. Some of the students approached to potentially participate in the study did not to even have an idea of what USSD/cellphone banking or MB applications are. Therefore, banks need to educate their customers on their products and services to fully exploit their market segments.

6.10 FINAL CONCLUSION

The research conducted presented greater insights learnt from selected mobile banking modes in East London, Eastern Cape. Technological innovation is continuously presenting economic growth and success. This is the time for banks to leverage the growth in mobile banking platforms for increasing their market share as well as reaching the South African non-banking population. Concerning factors that are critical to overall service quality and customer loyalty, the present study suggests that fulfilment, efficiency and privacy are fundamental to USSD/cellphone banking and MB application. These findings provide beneficial implications to both practitioners and academia based on the insight review of overall service quality and customer loyalty. Although the findings were insightful, several factors other than e-S-QUAL dimensions influence customer loyalty of USSD/cellphone banking and MB app. It would, therefore, be useful and practical for developing an integrated framework across mobile banking that may also influence customer loyalty.

LIST OF REFERENCES

Adewoye, J. (2013). Impact of mobile banking on service delivery in the Nigerian commercial banks. *International Review of Management and* Marketing *2*(2), 333–344.

Adil, M., Akhtar, A., & Khan, M. N. (2013). Refinement of internet banking service quality scale: A confirmatory factor analysis approach. *International Journal of Services and Operations Management*, *14*(3), 336–354.

Afshan, S., & Sharif, A. (2016). Acceptance of mobile banking framework in Pakistan. *Telematics and Informatics*, *33*(2), 370–387.

Agbor, J. M. (2011). *The Relationship between Customer Satisfaction and Service Quality : a study of three Service sectors in Umeå .* Umeå s.

Ahuja, M., Gupta, B., & Raman, P. (2003). An Empirical Investigation of Online Consumer Purchasing Behavior. *Communications of the ACM*, *46*(12), 145.

Akinci, S., Atilgan-Inan, E., & Aksoy, S. (2010). Re-assessment of E-S-Qual and E-RecS-Qual in a pure service setting. *Journal of Business Research*, *63*(3), 232–240.

Aldas-Manzano, J., Ruiz-Mafe, C., Sanz-Blas, S., & Lassala-Navarré, C. (2011). Internet banking loyalty: Evaluating the role of trust, satisfaction, perceived risk and frequency of use. *The Service Industries Journal*, *31*(7), 1165–1190.

Alsoufi, A., & Ali, H. (2014). Customers' perception o f m-banking a doption in kingdom o f Bahrain : An empirical a ssessment of a n extended TAM model. *International Journal of Managing Information Technology*, *6*(1), 1–13.

Ariff, M. S. M., Yun, L. O., Zakuan, N., & Ismail, K. (2013). The Impacts of Service Quality and Customer Satisfaction on Customer Loyalty in Internet Banking. In *Procedia - Social and Behavioral Sciences* (Vol. 81, pp. 469–473). Elsevier Ltd.

Asika, N. (2012). *Research Methodology in Behavioural Sciences*. New Delhi: PHI Learning Pvt. Ltd.

Atay, E., & Apak, S. (2013). An Overview of GDP and Internet Banking Relations in the European Union Versus China. *Procedia - Social and Behavioral Sciences*, *99*(4), 36–45.

Axis Bank. (2016). *Types Of Mobile Banking.* Retrieved from http://www.itsallaboutmoney.com/convenience-banking/mobile-banking/types-of-mobile-banking/

Ayo, C. k., Oni, A. A., Adewoye, O. J., & Eweoya, I. O. (2016). E-banking users' behaviour: e-service quality, attitude, and customer satisfaction. *International Journal of Bank Marketing*,

34(3), 347–367.

Babbie, E. (2016). *The basics of social research*. *Cengage Learning* (7th ed., Vol. 1). Boston: Cengage Learning.

Bai, B., Law, R., & Wen, I. (2008). The impact of website quality on customer satisfaction and purchase intentions: Evidence from Chinese online visitors. *International Journal of Hospitality Management*, *27*(3), 391–402.

Balakrishnan, V., & Raj, R. G. (2012). Exploring the relationship between urbanized Malaysian youth and their mobile phones: A quantitative approach. *Telematics and Informatics*, *29*(3), 263–272.

Barnard, Z. (2008). *Chapter 5. Empirical Research*. University of Johannesburg.

BASA. (2014). *South African Banking Sector Overview*. Johannesburg.

Beard, R. (2014). Why Customer Satisfaction Is Important (6 Reasons). Retrieved from http://blog.clientheartbeat.com/why-customer-satisfaction-is-important/

Beglar, D., & Nemoto, T. (2014). Developing Likert-scale questionnaires. In *JALT2013 Conference Proceedings* (pp. 1–8).

Beneke, J., Acton, A., Richardson, D., & White, F. (2011). E-service quality: An investigation of its key dimensions and the discriminatory power in the residential property sector. *Acta Commercii*, *11*(1), 75–87.

Berry, L. L., & Parasuraman, A. (1992). Marketing Services: Competing Through Quality. *Journal of Marketing*, *56*(2), 132.

Bick, G., Brown, A. B., & Abratt, R. (2004). Customer perceptions of the value delivered by retail banks in South Africa. *International Journal of Bank Marketing*, *22*(5), 300–318.

Bilbao, B., Dutta, S., & Lanvin, B. (2013). *The Global Information Technology Report 2013: Growth and Jobs in a Hyperconnected World*. *World Economic Forum, Geneva*. Geneva.

Bizcommunity. (2016). *Mobile banking the big winner in SA mobility study*. Retrieved from http://www.bizcommunity.com/Article/196/19/109053.html

Blaikie, N. (2003). *Analyzing Quantitative Data: From Description to Explanation*. London: Sage Publications.

Blumberg, B., Cooper, D., & Schindler, P. (2011). *Business Research Methods*. *Business Research Methods* (11th ed.). Boston: McGraw-Hill Education.

Blut, M., Chowdhry, N., Mittal, V., & Brock, C. (2015). E-Service Quality: A Meta-Analytic Review.

Journal of Retailing, *91*(4), 679–700.

Boomsma, A., & Hoogland, J. J. (2001). The Robustness of LISREL Modeling Revisited. In *Present and future. A Festschrift in honor of Karl Jöreskog* (pp. 139–168).

Boshoff, C. (2014). *Services Marketing: A Contemporary Approach*. (A. Voges, Ed.) (2nd ed.). Cape Town: Juta & Company Ltd.

Bosomworth, D. (2015). *Mobile marketing statistics 2016.* Retrieved from http://www.smartinsights.com/mobile-marketing/mobile-marketing-analytics/mobile-marketing-statistics/

Burger, S. (2010). *Mobile banking for South Africa?* Retrieved from http://www.engineeringnews.co.za/article/mobile-banking-for-south-africa-2010-09-24/rep_id:4136

Buttle, F. (1996). SERVQUAL : review , critique , research agenda. *European Journal of Marketing*, *30*(1), 8–32.

Calisir, F., & Gumussoy, C. A. (2008). Internet banking versus other banking channels: Young consumers' view. *International Journal of Information Management*, *28*(3), 215–221.

Capitec. (2008). *A snapshot of the market 1. South Africans who use formal fi nancial products (%)*. Johannesburg.

Capitec. (2016). *Intergrated Annual Report 2016*. *Capitec Bank Holdings Limited*. Johannesburg.

Casu, B., Girardone, C., & Molyneux, P. (2015). *Introduction to Banking* (2nd ed.). Edinburgh: Pearson Education.

Chandran, R. (2014). Pros and cons of Mobile banking. *International Journal of Scientific and Research Publications*, *4*(1), 2250–3153.

Chandrupatla, T. R. (2015). Quality Concepts: Quality and Reliability in Engineering. Cambridge: Cambridge University Press.

Chang, J.-C. (2009). Taiwanese tourists' perceptions of service quality on outbound guided package tours: A qualitative examination of the SERVQUAL dimensions. *Journal of Vacation Marketing*, *15*(2), 165–178.

Chesbrough, H., Vanhaverbeke, W., & West, J. (2011). Open innovation: Where we've been and where we're going. *Research Technology Management*, *55*(4), 20–27.

Chetan, K. (2015). *Why Is Quality Important for a Business? | Kumar Chetan | LinkedIn*. Retrieved from https://www.linkedin.com/pulse/why-quality-important-business-kumar-

chetan

Chung, N., & Kwon, S. J. (2009). Effect of trust level on mobile banking satisfaction: a multi-group analysis of information system success instruments. *Behaviour & Information Technology*, *28*(6), 549–562.

Church, K., Ernest, P., & Oliver, N. (2011). Understanding Mobile Web and Mobile Search Use in Today ' s Dynamic Mobile Landscape. In *Proceedings of the 13th International Conference on Human Computer Interaction with mobile Devices and Services* (pp. 67–76). ACM.

Collier, J. E., & Bienstock, C. C. (2006). Measuring service quality in E-retailing. *Journal of Service Research*, *8*(3), 260–275.

Collis, J., & Hussey, R. (2013). *Business Research: A Practical Guide for Undergraduate and Postgraduate Students* (Vol. 29). Wallingford: Palgrave Macmillan.

Competition and Markets Authority, C. (2015). *The commercial use of consumer data*. *Nature* (Vol. 103). London.

Coote, E., & Coetzee, K. (2012). *The Scope of the Electronics Industry in the Western Cape AC Access Market International (Pty) Ltd South Africa Eileen Coote*. Cape Town.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (4th ed.). Toledo: Sage Publications.

Creswell, J. W., & Plano, C. V. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks: Sage Publications.

Cronin, J. J., & Taylor, S. a. (1992). Measuring Service Quality: A Re-examination and Extension. *Journal of Marketing*, *56*(3), 55.

Crosby, P. (2017). *Quality Gurus*. Retrieved from http://www.qualitygurus.com/gurus/list-of-gurus/philip-crosby/

Dane, F. C. (2010). *Evaluating Research: Methodology for People Who Need to Read Research*. London: Sage Publications.

Das, L., & Raut, R. (2014). Impact of Changes in Service Sector in India in Shaping the Future of Business & Society. In *Procedia Economics and Finance* (Vol. 11, pp. 795–803).

Dobush, G. (2015). *How Mobile Phones Are Changing the Developing World - Consumer Technology Association*. Retrieved from http://www.cta.tech/Blog/Articles/2015/July/How-Mobile-Phones-Are-Changing-the-Developing-Worl.aspx

Donner, J., & Tellez, C. A. (2008). Mobile banking and economic development: linking adoption,

impact, and use. *Asian Journal of Communication*, *18*(4), 318–332.

Dudovskiy, J. (2016). *Research Methods.* Retrieved from http://research-methodology.net/research-methods/

Duff, S. (2014). *The latest statistics on South African Internet penetration | Web Africa Blog.* Retrieved from https://www.webafrica.co.za/blog/general/latest-statistics-south-african-internet-penetration/

EffectiveMeasure. (2014). *South Africa Mobile Report:A Survey od Desktop User's Attitudes and Uses of Mobile Phones*. Retrieved from www.effectivemeasure.com

ElFgee, E., & Arara, A. (2014). *Technical Requirements of New Framework for GPRS Security Protocol Mobile Banking Application*. *Procedia Computer Science* (Vol. 37).

Erspective, L. O. P., & Lusch, R. F. (2015). Service Innovation: A Service-Dominant-Logic perspective. *MIS Quarterly*, *39*(1), 155–175.

Falkena, H., Bamber, R., Llewellyn, D., & Store, T. (2001). *Philosophy, Objectives and Principles of Financial Regulation*. *Financial Regulation in South Africa*. Johannesburg.

Fenu, G., & Pau, P. L. (2015). An Analysis of Features and Tendencies in Mobile Banking Apps. In *Procedia Computer Science* (Vol. 56, pp. 26–33). Cagliari.

Field, A. (2009). *Discovering Statistics Using*. *International Statistical Review* (3rd ed., Vol. 81). London: Sage Publications.

Fink, A. (2013). *How to Conduct Surveys: A Step-by-Step Guide*. Garland: Sage Publications.

First National Bank (FNB). (2012). *FNB app gets eWallet.* Retrieved from http://bankmonitorsa.blogspot.co.za/2012/05/fnb-app-gets-ewallet.html?view=flipcard

Fisher-Fisher, M. (2010). *Absa follows the low-cost banking challenge*. Retrieved from http://bankmonitorsa.blogspot.co.za/2010/11/absa-follows-low-cost-banking-challenge.html?q=send+money

Flick, U. (2015). *Introducing Research Methodology: A Beginner's Guide to Doing a Research Project*. Galway: Sage Publications.

Frenz, M., & Ietto-Gillies, G. (2009). The impact on innovation performance of different sources of knowledge: Evidence from the UK Community Innovation Survey. *Research Policy*, *38*(7), 1125–1135.

Friedlander, M. L., Pieterse, A. L., & Lambert, J. E. (2012). The Evolution of Theory in Counseling Psychology. *APA Handbook of Counseling Psychology, Vol. 1: Theories, Research, and Methods.*, *1*(March), 31–57.

133

Gebauer, H., Gustafsson, A., & Witell, L. (2011). Competitive advantage through service differentiation by manufacturing companies. *Journal of Business Research*, *64*(12), 1270–1280.

George, D., Stryjak, J., Meloán, M., & Castells, P. (2015). *The Mobile Economy 2015*. Retrieved from https://gsmaintelligence.com/research/2015/03/the-mobile-economy-2015/491/

Google Play. (2017). *FNB Banking App - Android Apps on Google Play*. Retrieved from https://play.google.com/store/apps/details?id=za.co.fnb.connect.itt&hl=en

Gordon, D. (2010). *South Africa: Staying Ahead in the Virtual-Money Game.* Retrieved from http://bankmonitorsa.blogspot.co.za/2010/08/south-africa-staying-ahead-in-virtual.html?view=flipcard

Gordon, G. (2013). *Mobile banking goes smart - Vodacom now!* Retrieved from http://now.vodacom.co.za/article/2013/11/20/mobile-banking-goes-smart

Govender, I., & Sihlali, W. (2014). A Study of Mobile Banking Adoption among University Students Using an Extended TAM. *Mediterranean Journal of Social Sciences MCSER Publishing*, *5*(7), 2039–9340.

Gray, D. E. (2014). *Doing Research in the Real World* (1st ed.). London: Sage Publications.

Grönroos, C. (1984). A Service Quality Model and its Marketing implications. *European Journal of Marketing*, *18*(4), 36–44.

Grönroos, C. (2001). The Perceived Service Quality Concept – A Mistake? *Managing Service Quality*, *11*(3), 150–152.

GSMA. (2015). *Bridging the gender gap: Mobile access and usage in low- and middle-income countries*. Australia.

Gu, J. C., Lee, S. C., & Suh, Y. H. (2009). Determinants of behavioral intention to mobile banking. *Expert Systems with Applications*, *36*(9), 11605–11616.

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin*, *103*(2), 265–75.

Hair, J. F. J., Anderson, R. E., & Tatham, R. . (1998). *Multivariate Data Analysis* (5th ed.). London: Prentice Hall.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Planning*, *46*(1–2), 1–12.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial

least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414–433.

Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, *26*(2), 106–121.

Halliburton, P. C., & Poenaru, A. (2010). The Role of Trust in Consumer Relationships. *International Journal of Research in Marketing*, *20*(1), 0–16.

Hanafizadeh, P., Behboudi, M., Abedini, K. A., & Jalilvand, S. T. M. (2014). Mobile-banking adoption by Iranian bank clients. *Telematics and Informatics*, *31*(1), 62–78.

Hennink, M., Hutter, I. & Bailey, A. (2011). *Qualitative Research Methods*. London: Sage Publications.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of Partial Least Squares Path Modeling in International Marketing. *Advances in International Marketing*, *20*(2009), 277–319.

Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics*, *28*(2), 565–580.

Heskett, J. L. (1987). Lessons in the service sector. *Harvard Business Review*, *65*(2), 118–126.

Hodgkinson, D. (2015). *Mobile Banking 2015*. Retrieved from http://cs.stanford.edu/people/eroberts/cs181/projects/2010-11/SmartPhones/pt4.html

Honigman, B. (2014). *How to decide between a responsive website or a native mobile app.* Retrieved from http://thenextweb.com/dd/2014/02/08/decide-responsive-website-native-mobile-app/

Hoogland, J. J., & Boomsma, A. (1998). Robustness Studies in Covariance Structure Modeling: An Overview and a Meta-Analysis. *Sociological Methods & Research*, *26*(3), 329–367.

Humphreys, L., Von Pape, T., & Karnowski, V. (2013). Evolving Mobile Media: Uses and Conceptualizations of the Mobile Internet. *Journal of Computer-Mediated Communication*, *18*(4), 491–507.

Iacobucci, D., & Churchill, G. A. (2010). *Marketing Research: Methodological Foundations* (10th ed.). New York: Cengage Learning.

Iranzadeh, S., & Chakherlouy, F. (2004). S*ervice Quality Dimensions in the Banking Industry*

and Its Effect on Customer. Retrieved from http://www.intechopen.com/books/quality-management- and-practices/service-quality-dimensions-in-the-banking-industry-and-it-s-effect-on-customer-satisfaction- case-st

Ismail, T., & Masinge, K. (2012). Mobile banking: Innovation for the poor. *African Journal of Science, Technology, Innovation and Development*, *4*(3), 98–127.

Ivatury, G., & Pickens, M. (2006). *Mobile Phone Banking and Low-Income Customers: Evidence from South Africa*. *Consultative Group to Assist the Poor*.

Jonker, J., & Pennink, B. (2010). *The Essence of Research Methodology: A Concise Guide for Master and PhD Students in Management Science*. New York: Springer Science & Business Media.

Kabir, M. H., & Carlsson, T. (2010). *Service Quality : Expectations, perceptions and satisfaction about service quality at Destination Gotland - A case study*. *Service Quality: Expectations, perceptions and satisfaction about service quality at Destination Gotland - A case study*. Gotland University.

Kamarulzaman, Y., & Madun, A. (2013). Marketing Islamic banking products: Malaysian perspective. *Business Strategy Series*, *14*(2), 60–66.

Kandampully, J., Zhang, T. (Christina), & Bilgihan, A. (2015). Customer loyalty: a review and future directions with a special focus on the hospitality industry. *International Journal of Contemporary Hospitality Management*, *27*(3), 379–414.

Kazemi, D. A., Nilipour, D. A., Kabiry, N., & Hoseini, M. M. (2013). Factors Affecting Isfahanian Mobile Banking Adoption Based on the Decomposed Theory of Planned Behavior. *International Journal of Academic Research in Business and Social Sciences*, *3*(7), 230–245.

Kim, H. M. (2015). *The Applicability of E-S-QUAL for Assessing the Service Quality*. Drexel University.

Kim, H. M., & Nitecki, D. A. (2014). A Proposed Scale for Measuring the Quality of Social Media Services: An E-S-QUAL Approach. In *Proceedings of the American Society for Information Science and Technology 51.1* (pp. 1–4). Seattle.

Kim, J. B., & Kang, S. (2012). A study on the factors affecting the intention to use smartphone banking: The differences between the transactions of account check and account transfer. *International Journal of Multimedia and Ubiquitous Engineering*, *7*(3), 87–96.

Kim, J., Jin, B., & Swinney, J. L. (2009). The role of etail quality, e-satisfaction and e-trust in online loyalty development process. *Journal of Retailing and Consumer Services*, *16*(4),

239–247.

Kim, M., Kim, J.-H., & Lennon, S. J. (2006). Online service attributes available on apparel retail web sites: an E-S-QUAL approach. *Managing Service Quality:An International Journal*, *16*(1), 51–77.

Kothari, C. (2004). *Research Mathodology : Methods and Techniques*. New Delhi: New Age International.

Krugel, G. T. (2007). *Mobile Banking Technology Options*. Retrieved from http://www.gsma.com/mobilefordevelopment/wpcontent/uploads/2012/06/finmark_mbt_aug_07.pdf

Kumar, R. (2014). *Research Methodology: A Step-by-Step Guide for Beginners* (3rd ed). London: Sage Publications.

Kumbhar, V. M. (2012a). Refinement and Retesting of 'eBankQual' Scale in Internet Banking Service Settings, *2*(2), 1–14.

Kumbhar, V. M. (2012b). Reliability of ' Ebankqual ' Scale : Retesting in Internet Banking Service Settings. *Business Excellence and Management*, *2*(2), 13–24.

Lacey, R., & Sneath, J. Z. (2006). Customer loyalty programs: are they fair to consumers? *Journal of Consumer Marketing*, *23*(7), 458–464.

Lau, M. M., Cheung, R., Lam, A. Y. C., & Chu, Y. T. (2013). Measuring Service Quality in the Banking Industry: A Hong Kong Based Study. *Contemporary Management Research*, *9*(3), 263–282.

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

Leedy, P. D., & Ormrod, J. E. (2012). *Practical Research: Planning and Design*. *Practical Research - Planning & Design* (10th ed.). New Jersy: Pearson Education.

Lincoln, N. K., & Denzin, Y. S. (2011). *The Sage handbook of qualitative research*. (N. K. Denzin & Y. S. Lincoln, Eds.) (4th ed.). London: Sage Publications.

Loganathan, K. (2007). *An evaluation of the quality of service within Barclays retail banking in Mauritius*. University of Johannesburg.

Loiacono, E. T., Watson, R. T., & Goodhue, D. L. (2002). WebQual: A Measure of Web Site Quality. *Marketing Theory and Applications*, *13*(3), 432–438.

Lovelock, C. H., & Wirtz, J. (2011). Services Marketing - People, Technology, Strategy. In *Harvard Business Review* (7th ed., pp. 26–50). Edinburgh: Pearson Education.

Lu, C., Geng, W., & Wang, I. (2015). The Role of Self-Service Mobile Technologies in the Creation of Customer Travel Experiences. *Technology Innovation Management Review*, *5*(2), 24–32.

Makore, M. P. (2011). *Exploring Use of Mobile Banking Services by the Poor: Case of Wizzit Bank in South Africa*. Durban: Imtfi.

Malhotra, N. K. (1999). *Marketing Research: An Applied Orientation*. *The Handbook of Marketing Research Uses Misuses and Future Advances* (Vol. 10). London: Sage Publications.

Mallat, N., Rossi, M., & Tuunainen, V. K. (2004). Mobile Banking Services. *Communications of the ACM*, *47*(5), 42–46.

Mangal, S. K. & Mangal, S. (2013). *Research Methodology in Beahavioural Sciences*. Delhi: PHI Learning Pvt Ltd.

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, *56*(2), 429–440.

Masocha, R., Chiliya, N., & Zindiye, S. (2011). E-banking adoption by customers in the rural milieus of South Africa: A case of Alice, Eastern cape, South Africa. *African Journal of Business Management*, *5*(5), 1857–1863.

Masrek, M. N., Mohamed, I. S., Daud, N. M., & Omar, N. (2014). Technology Trust and Mobile Banking Satisfaction: A Case of Malaysian Consumers. *Procedia - Social and Behavioral Sciences*, *129*, 53–58.

Mastrojianni, E., & Tsoukatos, E. (2010). Key determinants of service quality in retail banking. *EuroMed Journal of Business*, *5*(1), 85–100.

Matthew, D. (2013). *Factors that impact consumer adoption of mobile banking within the m-commerce domain*. University of the Witwatersrand.

Mc. A Baker, D. (2013). Service Quality and Customer Satisfaction in the Airline Industry: A Comparison between Legacy Airlines and Low-Cost Airlines. *American Journal of Tourism Research*, *2*(1), 67–77.

McDaniel, C., & Gates, R. (2013). *Marketing Research,* (9th ed.). New Jersy: John Wiley & Sons.

McIntosh, C. N., Edwards, J. R., & Antonakis, J. (2014). Reflections on Partial Least Squares Path Modeling. *Organizational Research Methods*, *17*(2), 210–251.

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods*, *17*(3), 437–455.

Measure, E. ; I. S. A. ; S. (2014). *South Africa Mobile Report (March 2014)*. Retrieved from www.effectivemeasure.com

Meyer, J. (2015). *The future of mobile banking in South Africa.* Retrieved from http://www.fin24.com/Tech/Opinion/The-future-of-mobile-banking-in-South-Africa-20150211

Mishra, V., & Singh Bisht, S. (2013). Mobile banking in a developing economy: A customer-centric model for policy formulation. *Telecommunications Policy*, *37*(6), 503–514.

Mlitwa, N., & Tshetsha, N. (2012). Adoption of Cell-Phone Banking among Low-Income Communities in Rural Areas of South Africa. *iBusiness*, *4*(December), 362–370.

Mobile Ecosystem Forum. (2015). *Global mobile money report 2015.* Retrieved from http://www.mobileecosystemforum.com/solutions/global-mobile-money-initiative/global-mobile-money-report-2015/

Mobile Statistics. (2012). *Mobile Apps: What Consumers Really Need and Want - A Global Study of Consumers' Expectations and Experiences of Mobile Applications*.

Molla, A., & Licker, P. S. (2005). ECommerce adoption in developing countries: A model and instrument. *Information and Management*, *42*(6), 877–899.

Monecke, A. & Leisch, F. (2012). SEM-PLS : Structural Equation Modeling Using Partial Least Squares. *Journal of Statistical Software, 48*(3), 1–32.

Morawczynski, O., & Miscione, G. (2008). Examining trust in mobile banking transactions: The case of M-PESA in Kenya. In *IFIP International Federation for Information Processing* (Vol. 282, pp. 287–298). Springer.

Morrar, R. (2014). Innovation in Services: A Literature Review. Retrieved from www.timreview.ca

Mosahab, R. (2010). Service Quality , Customer Satisfaction and Loyalty : A Test of Mediation. *International Business*, *3*(4), 72–80.

Neil, M., Douglas, B., & Elliott, J. (2013). *The Role of Finance in the Economy: Implications for Structural Reform of the Financial Sector*. *The Brookings Institution*. New York.

Ngai, E. W. T., & Gunasekaran, A. (2007). A review for mobile commerce research and applications. *Decision Support Systems*, *43*(1), 3–15.

Ngandu, T. B. (2012). *Perceptions of electronic banking among Congolese clients of South African Banks in the Greater Durban area*. Durban University of Technology.

Nicholson, D. (2015). *LibGuides: Mobile Technologies, M-Learning & Social Networking: Mobile Banking.* Retrieved from http://libguides.wits.ac.za/c.php?g=145368&p=953630

Ntingi, A. (2006). *Nedbank eyes cellphone banking.* Retrieved from http://www.fin24.com/Business/Nedbank-eyes-cellphone-banking-20060108

Nyeko, J. S., Moya, M., Kabaale, E., & Odongo, J. (2014). Factors Influencing the Short Message Service (SMS) Mobile Banking Adoption: A Users' Perspective in the West Nile Region in Uganda. *European Journal of Business and ManagementOnline)*, *6*(5), 2222–2839.

O'Dwyer, L., & Bernauer, J. (2014). *Quantitative research for the qualitative researcher*. London: Sage Publications.

O'Leary, Z. (2004). *The Essential Guide to Doing Research* (1st ed.). London: Sage Publications.

Ojo, O. (2010). The Relationship Between Service Quality and Customer Satisfaction in the Telecommunication Industry : Evidence From Nigeria. *Broad Research in Accounting, Negotiation, and Distribution*, *1*(1), 88–100.

Ondiege, P. (2010). Mobile banking in Africa: Taking the bank to the people. *Africa Economic Brief*, *1*(8), 1–15.

Oppong, P., Adjei, H., & Poku, K. P. (2014). the Role of Information Technology in Building Customer Loyalty in Banking: (a Case Study of Agricultural Development Bank Ltd., Sunyani). *British Journal of Marketing Studies*, *2*(4), 9–29.

Osei, A. M., Opoku, A. C., & Seth, A. (2016). Redefining Service Quality Dimensions in Electronic Banking from Extant Theories. *British Journal of Economics, Management & Trade*, *11*(3), 1–22.

Oyeniyi, O., & Joachim, A. A. (2008). Customer service in the retention of mobile phone users in Nigeria. *African Journal of Business Management*, *2*(2), 26–31.

Panneerselvam, R. (2014). *Research Methodology* (2nd ed.). Oxford: Prentice-Hall.

Parassuman, A., Berry, L. L., & Zeithaml, V. A. (1992). Refinement of the Servqual scale. *Jorunal of Retailing*, *67*(4), 420.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, *49*(4), 41–50.

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL: A Multiple-Item Scale for Assessing Electronic Service Quality. *Journal of Service Research*, *7*(3), 213–233.

Parasuraman, A., Zeithaml, V. A, & Berry, L. L. (1988). SERQUAL: A Multiple-Item scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, *64*(2), 1–28.

140

Parasuraman, A., Zeithaml, V., & Berry, L. (1991). Refinement and reassesment of the SERVQUAL scale. *Journal of Retailing*, *67*(4), 420–450.

Parumasur, S. B., & Krishundutt, M. (2009). Using the conceptual model of service quality to map gaps in perceived service quality in a banking sector and hence make recommendations for improvement. *International Retail and Marketing Review*, *5*(2), 41–58.

Paton, R. A., & McLaughlin, S. (2008). Services innovation: Knowledge transfer and the supply chain. *European Management Journal*, *26*(2), 77–83.

Peevers, G., Douglas, G., & Jack, M. A. (2008). A usability comparison of three alternative message formats for an SMS banking service. *International Journal of Human-Computer Studies*, *66*(2), 113–123.

Porteous, D. (2006). *The Enabling Environment for Mobile Banking in Africa.* Retrieved from http://www.cab.org.in/ICTPortal/Lists/Knowledge Bank/Attachments/14/Enabling Environment for M-banking - Porteous_16_12_200749.pdf%5Cnhttp://www.bankablefrontier.com/assets/ee.mobil.banking.report.v3.1.pdf

Porteous, D. (2007). *Just How Transformational Is M-Banking?* Boston: FinMark Trust.

Porter, M. (1990). *The Competitive Advantage of Nations.* Retrieved from https://hbr.org/1990/03/the-competitive-advantage-of-nations

PricewaterhouseCoopers. (2015). *Navigating a volatile landscape Major banks analysis – South Africa.* Retrieved from https://www.pwc.co.za/en/assets/pdf/bank-analysis-march-2015.pd

Purwanegara, M., Apriningsih, A., & Andika, F. (2014). Snapshot on Indonesia Regulation in Mobile Internet Banking Users Attitudes. In *Procedia - Social and Behavioral Sciences* (Vol. 115, pp. 147–155).

Rafiq, M., Lu, X., & Fulford, H. (2012). Measuring Internet retail service quality using E-S-QUAL. *Journal of Marketing Management*, *28*(9–10), 1159–1173.

Rajasekar, S., Philominathan, P., & Chinnathambi, V. (2014). *Research Methodology*. Retrieved fromhttps://doi.org/http://196.29.172.66:8080/jspui/bitstream/123456789/2574/1/Research Methodology.pdf

Raleting, T., & Nel, J. (2011). Determinants of low-income non-users ' attitude towards WIG mobile phone banking : Evidence from South Africa. *African Journal of Business Management*, *5*(1), 212–223.

Raman, M., Stephenaus, R., Alam, N., & Kuppusamy, M. (2008). Information Technology in

Malaysia: E-service quality and Uptake of Internet banking. *Journal of Internet Banking & Commerce*, *13*(2), 1–18.

Randle, M., Mackay, H., & Dudley, D. (2014). A comparison of group-based research methods. *Market & Social Research*, *22*(1), 22–38.

Rauniar, R., Rawski, G., Crumbly, J., & Simms, J. (2009). C2C online auction website performance : Buyer's perspective. *Journal of Electronic Commerce Research*, *10*(2), 56–75.

Rauyruen, P., & Miller, K. E. (2006). Relationship quality as a predictor of B2B customer loyalty. *Journal of Business Research*, *60*(1), 21–31.

Ribeiro, J. M. (1993). *The components of service quality- An application to the transportation insdustry in Portugal*. Universidade Do Porto.

Rodríguez-Pineda, J. A. (2000). *Webqual (tm): a web site quality instrument*. Austin.

Santouridis, I., & Kyritsi, M. (2014). Investigating the Determinants of Internet Banking Adoption in Greece. *Procedia Economics and Finance*, *9*, 501–510. https://doi.org/10.1016/S2212-5671(14)00051-3

Santouridis, I., Trivellas, P., & Georgios, T. (2012). Using E-S-QUAL to measure internet service quality of e-commerce web sites in Greece. *International Journal of Quality and Service Sciences*, *4*(1), 86–98.

Sapsford, R., & Jupp, V. (2006). *Data Collection and Analysis*. *Data Collection and Analysis* (2nd ed.). London: Sage Publications.

Schmiedl, G., Seidl, M., & Temper, K. (2009). *Mobile Phone Web Browsing – A Study on Usage and Usability Of The Mobile Web.* Retrieved from http://dl.acm.org/citation.cfm?id=1613942

Sekaran, U., & Bougie, R. (2013). *Research methods for business: A skill-building approach* (6th ed.). New York: Wiley & Sons.

Seth, N., Deshmukh, S. G., & Vrat, P. (2005). Service quality models: a review. *International Journal of Quality & Reliability Management*, *22*(9), 913–949.

Shaikh, A. A., & Karjaluoto, H. (2014). Mobile banking adoption: A literature review. *Telematics and Informatics*, *32*(1), 129–142.

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

Shanka, M. S. (2012). Bank Service Quality , Customer Satisfaction and Loyalty in Ethiopian

Banking Sector, *1*(1), 1–9.

Sikdar, P., Kumar, A., & Makkad, M. (2015). Online banking adoption: A factor validation and satisfaction causation study in the context of Indian banking customers. *International Journal of Bank Marketing*, *11*(6), 8–10.

Singh, A. B. (2012). Mobile Banking Based Money Order for India Post: Feasible Model and Assessing Demand Potential. In *Procedia - Social and Behavioral Sciences* (Vol. 37, pp. 466–481). Pune City: Elsevier.

Singh, A. M. (2004). Trends in South African Internet banking. *Aslib Proceedings*, *56*(3), 187–196.

Singh, K. (2011). Innovated technology in banking services. *Journal of Internet Banking and Commerce*, *16*(2), 1–15.

Singh, S. R. (2012). *Research Methodology*. New Delhi: APH Publishing Corporation.

Staff, X. (2015). Exploring Innovation. *XRDS*, *22*(2), 8.

Standard Chartered Bank. (2015). *Technology: Reshaping the global economy Special Report*. Retrieved from https://www.sc.com/BeyondBorders/wp-content/uploads/2015/01/2015-01-19-Technology-Report-FINAL.pdf

Stevens, J. (2002). *Applied multivariate statistics for the social sciences* (4th ed.). Mahwah N.J: Lawrence Erlbaum Associates.

Strömgren, O. (2007). *Analyzing Service Quality: A study among peruvian resort hotels*. Luleå University of Technology.

Subsorn, P., & Limwiriyakul, S. (2012). A Comparative Analysis of Internet Banking Security in Thailand: A Customer Perspective. In *Procedia Engineering* (Vol. 32, pp. 260–272).

Tan, K. S., Chong, S. C., Loh, P. L., & Lin, B. (2010). An evaluation of e-banking and m-banking adoption factors and preference in Malaysia: a case study. *International Journal of Mobile Communications*, *8*(5), 507–527.

Technopedia. (2016). *What is a Mobile Application? - Definition from Techopedia*. Retrieved from https://www.techopedia.com/definition/2953/mobile-application-mobile-app

Tenenhaus, M., Amato, S., & Vinzi, V. E. (2004). A global Goodness–of–Fit index for PLS structural equation modelling Un indice di validazione globale per i modelli ad equazioni strutturali con il metodo PLS. In *In Proceedings of the XLII SIS Scientific Meeting* (pp. 739–742). Padova: CLEUP.

Thulani, D., Kosmas, N., Collins, M., & Lloyd, C. (2011). Adoption And Use of SMS / Mobile

Banking Services in Zimbabwe : An Exploratory Study. *Journal of Internet Banking and Commerce*, *16*(2), 1–15.

Tiwari, R., Buse, S., & Herstatt, C. (2007). *Mobile Services in Banking Sector : The Role of Innovative Business Solutions in Generating Competitive Advantage. Technologie- und Innovationsmanagement* (Vol. 48).

Tobergte, D. R., & Curtis, S. (2013). The correlation between service quality, satisfaction and loyalty. *Journal of Chemical Information and Modeling*, *53*(9), 1689–1699.

Trochim, W. M. K. (2006). *Data Preparation.* Retrieved from http://www.socialresearchmethods.net/kb/statprep.php

Tsourela, M. (2014). Using E-S-QUAL to measure internet service quality of E-Banking web sites in Greece. *Journal of Internet Banking and Commerce*, *19*(2), 1–17.

Turner, T. (2009). A review of reviews about e-government: What are we not doing? In *Proceedings of the European Conference on e-Government, ECEG* (pp. 638–645).

Van Der Boor, P., Oliveira, P., & Veloso, F. (2014). Users as innovators in developing countries: The global sources of innovation and diffusion in mobile banking services. *Research Policy*, *43*(9), 1594–1607.

Van Velden, L., Roopnarain, R., Kana, H., & Nitish, M. (2015). *Resilent through challenging times .Major banks analysis – South Africa.*

van Zyl, A. (2011). Innovation in South Africa -- The role of the Technological Innovation Agency. *South African Journal of Science*, *107*(1/2), 1–2.

Wahab, S., Suffian, A., Zahari, M., Momani, K. Al, Azila, N., & Nor, M. (2011). The influence of perceived privacy on customer loyalty in mobile phone services : An Empirical Research in Jordan. *International Journal of Computer Science*, *8*(2), 45–52.

Wiid, J., & Diggines, C. (2013). *Marketing Research*. (W. Prillaid, Ed.) (2nd ed.). Cape Town: Juta & Company.

Wiid, J., & Diggines, C. (2015). *Marketing research*. (J. Stern, Ed.) (3rd ed.). Cape Town: Juta and Company.

Wilson, C. (2015). *What you need to know about FNB's SIM cards - Stuff*. Retrieved from http://www.stuff.co.za/what-you-need-to-know-about-fnbs-sim-cards/

Wilson, M. (1999). The development of the Internet in South Africa. *Telematics and Informatics*, *16*(3), 99–111.

Wolfinbarger, M., & Gilly, M. C. (2003). eTailQ: Dimensionalizing, measuring and predicting etail

quality. *Journal of Retailing*, *79*(3), 183–198.

Wong, K. K. (2013). Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS. *Marketing Bulletin*, *24*(1), 1–32.

World Economic Forum. (2016). *Global Competitiveness Report World Economic Forum.* Retrieved from http://reports.weforum.org/global-competitiveness-report-2015-2016/economies/#economy=ZAF

Writer, S. (2014). *FNB banking App hits 1 million devices.* Retrieved from http://mybroadband.co.za/news/banking/112084-fnb-banking-app-hits-1-million-devices.html

Yang, H., & Feng-Shii Tsai. (2007). General E-S-QUAL Scales Applied to Websites Satisfaction and Loyalty Model. *Communications of the IIMA*, *7*(2), 115–126.

Yang, K. C. C. (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. *Telematics and Informatics*, *22*(3), 257–277.

Yoo, B., & Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale. *Journal of Business Research*, *52*(1), 1–14.

Yu, S. (2009). *Factors influencing the use of Mobile Banking : The case of SMS-based Mobile Banking*. Auckland University of Technology.

Zavareh, F. B., Ariff, M. S. M., Jusoh, A., Zakuan, N., Bahari, A. Z., & Ashourian, M. (2012). E-Service Quality Dimensions and Their Effects on E-Customer Satisfaction in Internet Banking Services. In *Procedia - Social and Behavioral Sciences* (Vol. 40, pp. 441–445).

Zehir, C., Sehitoglu, Y., Narcikara, E., & Zehir, S. (2014). E-S-Quality, Perceived Value and Loyalty Intentions Relationships in Internet Retailers. In *Procedia - Social and Behavioral Sciences* (Vol. 150, pp. 1071–1079). Elsevier.

Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, *60*(2), 31–46.

Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. (2013). *Services Marketing* (6th ed.). Berkshire: McGraw-Hill Education.

Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). Service Quality Delivery through Web Sites: A Critical Review of Extant Knowledge. *Journal of the Academy of Marketing Science*, *30*(4), 362–375.

Zhao, X., Bai, C., & Hui, Y. V. (2002). An empirical assessment and application of SERVQUAL in a Mainland Chinese department store. *Total Quality Management*, *13*(2), 241–254.

145

Zhao, Y. an, Zhou, W., & Huesig, S. (2010). Innovation as clusters in knowledge intensive business services: taking ICT services in Shanghai and Bavaria as an example. *International Journal of Innovation Management*, *14*(1), 1–18.
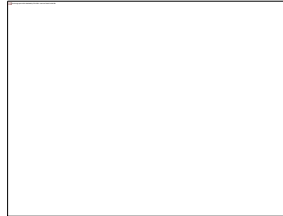
APPENDICES

Appendix A: Questionnaire

Questionnaire

Ethical Clearance Number: VIL121SCHI01

Masters Research Questionnaire: Mobile Banking: A comparison of e-service quality and customer loyalty

Dear Respondent

I am a master's student at UFH and am currently conducting a study on **Mobile Banking: A comparison of e-service quality and customer loyalty**. If you have ever used mobile banking, it would be greatly appreciated if you could possibly complete the below questionnaire.

Please understand that you are not being forced to take part in this study and the choice whether to participate or not is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you choose not take part in answering these questions, you will not be affected in any way. If you agree to participate, you may stop at any time if you feel uncomfortable. If you do this there will also be no penalties and you will NOT be prejudiced in ANY way.

Confidentiality will be observed and in no way will your identity be revealed in this research. I will not be recording your name anywhere on the questionnaire and no one will be able to link you to the answers you give. The information will remain confidential and there will be no "come-backs" from the answers you give. We request that you please complete the page at the end of the questionnaire by simply affixing your signature and date; this indicates that you understand our confidentiality clause and that this research will not harm you in any way. Furthermore by signing this page you are indicating that you were not pressurised into completing this questionnaire and you agreed without duress. This page will be kept separate from your questionnaire so that your identity is not revealed in relation to your answers.

With respect to the questionnaire, all you need to do is indicate the correct answer in relation to the statement provided, for most of the questions you need to indicate with a cross how strongly you agree or disagree with the statement. Please try to be as honest as possible when answering the questions. If you have any questions regarding this study please do not hesitate to contact my supervisors, Dr. Kim Viljoen (kviljoen@ufh.ac.za) and Ms. Mari Ford (mford@ufh.ac.za). Your contribution to my study will be much appreciated.

Yours sincerely,

Darlington Tawanda Chigori (UFH Business Management Master's student)

Section A

Biographical Details (please mark your answer with a (x) inappropriate box)

1. Gender

Male	Female

3. Age

18 -25	26 –35	36 -44	45 -54	55 -64	Over 65

3. Which bank do you bank with?

First National Bank (FNB) ☐

Standard Bank ☐

Amalgamated Banks of South Africa (ABSA) ☐

Nedbank ☐

Capitec ☐

Other ☐

4. Which type of Mobile banking do you use?

a) Mobile Banking Applications (Mobile Banking MB) ☐

b) US banking (Cellphone banking) ☐

c) Both ☐

If you ticked (a) please answer only Section 'A'; if you selected (b) answer section 'B' and if you selected (c) answer both Section 'A' and 'B'.

SECTION B: MOBILE BANKING APPLICATIONS

| Statement number	Please put a cross in the appropriate block indicating whether you strongly disagree, disagree, neither agree nor disagree, agree or strongly agree with each of the following statements	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
	CUSTOMER LOYALTY					
MBL1	I would consider mobile phone banking applications as my first choice for future financial transactions	1	2	3	4	5
MBL2	I intend to continue doing transactions through mobile phone banking Applications site in the future	1	2	3	4	5
MBL3	I think that I would recommend mobile phone banking Applications to someone who seeks my advice	1	2	3	4	5
MBL4	I would encourage friends and relatives to do transactions with mobile phone banking applications	1	2	3	4	5
MBL5	I think I would say positive things about mobile phone banking applications to other people	1	2	3	4	5
	FULFILMENT					
MBF1	Mobile phone banking applications service delivers timely information	1	2	3	4	5
MBF2	Mobile phone banking applications gives responses for my questions within suitable time	1	2	3	4	5
MBF3	Mobile phone banking applications provide information that I seek	1	2	3	4	5
MBF4	Mobile banking applications provide information that I would like	1	2	3	4	5
MBF5	Mobile banking applications have information of what is going on within the bank	1	2	3	4	5
MBF6	Mobile banking applications are truthful about the information they provide	1	2	3	4	5
MBF7	Mobile banking applications deliver accurate information	1	2	3	4	5
	EFFICIENCY					
MBF1	The mobile phone banking applications services make it easy to find banking information I need	1	2	3	4	5
MBF2	The mobile phone banking applications makes it easy to get anywhere on the site	1	2	3	4	5
MBF3	The mobile phone banking applications enable me to complete a transaction quickly	1	2	3	4	5
MBF4	The mobile phone banking applications have well organised information on the site	1	2	3	4	5
MBF5	Mobile phone banking applications loads its pages fast	1	2	3	4	5

MBF6	The mobile phone banking applications is simple to use	1	2	3	4	5
MBF7	The mobile phone banking applications site enables me to get onto it quickly.	1	2	3	4	5
MBF8	The mobile phone banking applications is well organized	1	2	3	4	5
	SYSTEM AVAILABILITY					
MBSA1	My mobile phone banking applications site is always available for banking service	1	2	3	4	5
MBSA2	My mobile phone banking applications launches and runs right away	1	2	3	4	5
MBSA3	My mobile phone banking applications site does not crash	1	2	3	4	5
MBSA4	My bank's mobile phone banking applications pages do not freeze after I enter my information	1	2	3	4	5
	PRIVACY					
MBP1	Mobile phone banking applications protects information about my browsing pages, clicking links on my banking account	1	2	3	4	5
MBP2	The mobile banking applications does not share my personal banking information with other sites	1	2	3	4	5
MBP3	The mobile banking applications protects information about my banking card/s	1	2	3	4	5
	OVERALL SERVICE QUALITY					
MBQ1	Overall quality of the mobile phone banking applications banking services is high	1	2	3	4	5
MBQ2	The information and services available on this mobile phone banking applications is adequate	1	2	3	4	5
MBQ3	The extent to which mobile phone banking applications services gives you a feeling of being in control of what you intend to do is high	1	2	3	4	5
MBQ4	The overall value you get from mobile phone banking applications service for your efforts	1	2	3	4	5

SECTION C: USSD BANKING (CELLPHONE BANKING)

	CUSTOMER LOYALTY					
USL1	I would consider US banking as my first choice for future financial transactions	1	2	3	4	5
USL2	I intend to continue doing transactions through US banking site in the future	1	2	3	4	5
USL3	I think that I would recommend US banking to someone who seeks my advice	1	2	3	4	5
USL4	I would encourage friends and relatives to do transactions with US banking	1	2	3	4	5
USL5	I think I would say positive things about US banking to other people	1	2	3	4	5
	FULFILMENT					
USF1	US banking service delivers timely information	1	2	3	4	5
USF2	US banking gives responses for my questions within suitable time	1	2	3	4	5
USF3	US banking provides information that I seek	1	2	3	4	5
USF4	US banking provides information that I would like	1	2	3	4	5
USF5	US banking has information of what is going on within the bank	1	2	3	4	5
USF6	US banking is truthful about the information it provides	1	2	3	4	5
USF7	US banking delivers accurate information	1	2	3	4	5
	EFFICIENCY					
USE1	The mobile US banking services make it easy to find banking information I need	1	2	3	4	5
USE2	The mobile US banking makes it easy to get anywhere on the site	1	2	3	4	5
USE3	The mobile US banking enables me to complete a transaction quickly	1	2	3	4	5
USE4	The mobile US banking has well organised information on the site	1	2	3	4	5
USE5	Mobile US banking loads its pages fast	1	2	3	4	5
USE6	The mobile US banking is simple to use	1	2	3	4	5
USE7	The mobile US banking site enables me to get onto it quickly.	1	2	3	4	5
USE8	The mobile US banking is well organized	1	2	3	4	5
	SYSTEM AVAILABILITY					
USSA1	My bank's US banking site is always available for banking service	1	2	3	4	5
USSA2	My bank's US banking launches and runs right away	1	2	3	4	5
USSA3	My bank's US banking site does not crash	1	2	3	4	5
USSA4	My bank's mobile US banking pages do not freeze after I enter my information	1	2	3	4	5
	PRIVACY					
USP1	Mobile phone US banking protects information about my browsing pages, clicking links on my banking account	1	2	3	4	5
USP2	The US banking does not share my personal banking information with other sites	1	2	3	4	5
USP3	The US banking protects information about my banking card/s	1	2	3	4	5
	OVERALL SERVICE QUALITY					

USQ1	Overall quality of the US banking services is high	1	2	3	4	5
USQ2	The information and services available on this US banking are adequate	1	2	3	4	5
USQ3	The extent to which US banking services gives you a feeling of being in control of what you intend to do is high	1	2	3	4	5
USQ4	The overall value you get from US banking service for your efforts	1	2	3	4	5

Appendix: Ethical Clearance Certificate
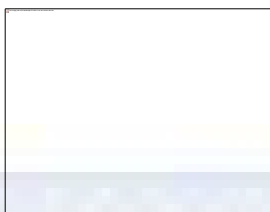
ETHICAL CLEARANCE CERTIFICATE
REC-270710-028-RA level 01

Certificate Reference Number: **VIL121SCHI01**

Project title: **Mobile Phone Banking: A Comparative Analysis of E-Service Quality and Customer Loyalty**

Nature of Project: Masters

Principal Researcher: Darlington Tawanda Chigori

Supervisor: Dr. K Viljoen
Co-supervisor N/A

On behalf of the University of Fort Hare's Research Ethics Committee (UREC) I hereby give ethical approval in respect of the undertakings contained in the above- mentioned project and research instrument(s). Should any other instruments be used, these require separate authorization. The Researcher may therefore commence with the research as from the date of this certificate, using the reference number indicated above.

Please note that the UREC must be informed immediately of

- o Any material change in the conditions or undertakings mentioned in the document
- o Any material breaches of ethical undertakings or events that impact upon the ethical conduct of the research

The Principal Researcher must report to the UREC in the prescribed format, where applicable, annually, and at the end of the project, in respect of ethical compliance.

Special conditions: Research that includes children as per the official regulations of the act must take the following into account:

Note: The UREC is aware of the provisions of s71 of the National Health Act 61 of 2003 and that matters pertaining to obtaining the Minister's consent are under discussion and remain unresolved. Nonetheless, as was decided at a meeting between the National Health Research Ethics Committee and stakeholders on 6 June 2013, university ethics committees may continue to grant ethical clearance for research involving children without the Minister's consent, provided that the prescripts of the previous rules have been met. This certificate is granted in terms of this agreement.

The UREC retains the right to

- o   Withdraw or amend this Ethical Clearance Certificate if
    - o   Any unethical principal or practices are revealed or suspected of Relevant information has been withheld or misrepresented
        - o   Regulatory changes of whatsoever nature so require
        - o   The conditions contained in the Certificate have not been adhered to

- o   Request access to any information or data at any time during the course or after completion of the project.

- o   In addition to the need to comply with the highest level of ethical conduct principle investigators must report back annually as an evaluation and monitoring mechanism on the progress being made by the research. Such a report must be sent to the Dean of Research's office

The Ethics Committee wished you well in your research.

Yours sincerely

05 August 2016