

An Empirical Framework for Banking Digitally Unbanked Seniors

By

Bongani Harry Diako

Student Number: 72421010

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Student name: Bongani Diako	Student no: 72421010	
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December 2019

Bongani Diako

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ABSTRACT

The main thrust of the thesis is an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking. Population ageing is a worldwide phenomenon and seniors' numbers are projected to grow to beyond 1 billion people globally by this year (2020). Currently, seniors and other banking customers are surrounded by various forms of e-banking technologies. E-banking is further envisaged to be the catalyst of the financial inclusion of the unbanked people of all ages. However, the problem is that customers' adoption of e-banking is a challenge for the banks. Seniors are particularly not willing to use e-banking. Thus, seniors stay digitally unbanked and this makes their inclusion into the financial marketplace a priority. How the banks could use e-banking to bank digitally unbanked seniors and, as a consequence improve financial inclusion, is the problem the study set out to resolve. Therefore, an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking was conducted and, as a result, an empirical framework of how the banks can extend these services to this population segment was developed.

An original theoretical framework primarily founded on the TAM and Baroudi's customers' technology design involvement theory was proposed. Structural Equation Modelling (SEM) with latent constructs was utilised. The measurement model was first estimated and then covariance matrix between variables served as input to estimate the structural coefficients between constructs. The study's data was collected by means of a structured questionnaire survey, utilising a probability sampling method with a sample of 420 digitally unbanked seniors. A focus group with banking industry experts was also held to consider the findings.

The study's findings empirically verified the study's model's strength in determining digitally unbanked seniors' willingness to use e-banking. Latent constructs under consideration included customer co-creation, awareness and empowerment, design, perceived ease of use, usefulness, cost, attitude, privacy and security, and trust. The findings demonstrate that design, attitude, privacy and security are statistically significant determinants of digitally unbanked seniors' willingness to use e-banking. Managerial implications and recommendations are provided in the recommendations chapter.

Keywords: Adoption. Attitude. Banking. Cost. Co-creation. Customer Involvement. Design. E-banking. ICT. Financial exclusion. Financial inclusion. Perceived Ease of Use. Perceived Usefulness. SDLC. SEM. Seniors. TAM. Theory. Trust. Unbanked.

OPSOMMING

Die hoofbetoog van die tesis is 'n empiriese ontleding van die probleme wat ervaar word deur ongebankte pensionarisse om hulle banksake digitaal te doen. Bevolkingsveroudering is 'n wêreldwye verskynsel en daar is voorspel dat die getal pensionarisse teen vanjaar (2020) 1 miljard mense wêreldwyd sou verbystee. Tans is daar 'n groot verskeidenheid elektroniese bankdienste beskikbaar wat pensionarisse en ander bankkliënte kan gebruik om hulle banksake te doen. Daar word ook verwag dat elektroniese bankwese die katalisator sal wees van die finansiële insluiting van ongebankte mense van alle ouderdomme. Die probleem is egter dat die aanname van elektroniese bankwese deur kliënte 'n uitdaging vir banke is. Pensionarisse is veral nie gewillig om elektroniese bankdienste te gebruik nie, en hulle bly dus ongebank. Dit veroorsaak dat hulle insluiting in die finansiële mark 'n prioriteit is. Die probleem wat hierdie studie wil oplos is hoe die banke elektroniese bankwese kan gebruik om digitaal ongebankte pensionarisse te kry om bankdienste te gebruik. Dus is 'n empiriese ontleding uitgevoer van die probleme wat ongebankte pensionarisse ervaar om hulle banksake digitaal te doen. Gevolglik is 'n empiriese raamwerk ontwikkel van hoe die banke hulle dienste na hierdie bevolkingsegment kan uitbrei.

'n Oorspronklike, teoretiese raamwerk, wat hoofsaaklik gegrond is op die kliëntetegnologieontwerp-betrokkenheidsteorie van TAM en Baroudi, is voorgestel. Strukturele gelykstellingsmodellering (SEM) met latente konstruksie is aangewend. Die metingsmodel is eers bereken en die kovariansiematriks tussen veranderlikes het gedien as inset om die strukturele koëffisiënte tussen konstrunkte te bereken. Die studie se data is ingesamel deur middel van 'n gestruktureerde vraelysopname, met 'n waarskynlikheidsteekproefneming van 420 digitaal ongebankte pensionarisse. Daar is ook 'n fokusgroep met kundiges in die bankwese gehou om die bevindings te oorweeg.

Die studie se bevindings het die studiemodel se vermoë om die gewilligheid te bepaal van digitaal ongebankte pensionarisse om elektroniese bankdienste te gebruik empiries bevestig. Latente konstrunkte onder oorweging het medeskepping van kliënte, bewustheid en bemagtiging, ontwerp, waargenome gebruiksgemak, bruikbaarheid, koste, houding, privaatheid en sekuriteit, en vertrouwe ingesluit. Die bevindings demonstreer dat ontwerp, houding, privaatheid en sekuriteit statisties beduidende determinante is van digitaal ongebankte pensionarisse se gewilligheid om elektroniese bankdienste te gebruik. Bestuursimplikasies en aanbevelings word voorsien in die aanbevelingshoofstuk.

Sleutelwoorden: Aanne, houding, bankwese, koste, medeskepping, kliëntebetrokkenheid, ontwerp, e-bankwese, ICT, finansiële uitsluiting, finansiële insluiting, waargenome gebruiksgemak, waargenome bruikbaarheid, SDLC, SEM, TAM, teorie, vertrou, ongebankte.

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LIST OF ABBREVIATIONS

ABSA:	Amalgamated Banks of South Africa
AMOS:	Analysis of Moment Structures
ATM:	Automatic Teller Machine
BASA:	Banking Association of South Africa
B2B	Businesses to Business
BI:	Bank Initiative
CFA:	Confirmatory Factor Analysis
CFI:	Comparative Fit Index
CI:	Customer Involvement
CMIN/DF:	Chi-square Min/Degree of Freedom
DV:	Dependent Variable
E-Banking:	Electronic Banking
EU:	Ease of Use
FNB:	First National Bank
ICT:	Information Communication Technology
IDT:	Innovation Diffusion Theory
IFI:	Incremental Fit Index
IoT:	Internet of Things
IS	Information Systems
IT	Information Technology
IV:	Independent Variable
M-Banking:	Mobile Banking
OECD:	Organization for Economic Cooperation and Development
OTP:	One-Time-Password
PEOU:	Perceived Ease of Use
PPS method:	Population Proportionate to Size method
RMSEA:	Root Mean Square Error Approximation
SABRIC:	South African Banking Risk Information Centre
SASSA:	South African Social Security Agency
SDLC:	System Development Lifecycle
SEM:	Structural Equation Modeling
SPSS:	Statistical Package for Social Sciences

TAM:	Technology Acceptance Model
TIR:	Theory of Innovation Resistance
TPB:	Theory of Planned Behaviour
TPR:	Theory of Perceived Risk
TRA:	Theory of Reasoned Action
UN:	United Nations
UTAUT:	Unified Theory of Acceptance and Use of Technology

GLOSSARY OF TERMS

Concept Matrix	Refers to the literature review management template that is used to manage the published literature information in a particular chosen topic area, including by age and the number of sources utilised for the purposes of a literature review exercise.
Construct	Means a mental concept that is used to express an idea as a means of bringing theory to a common understanding by explaining its different components (for example, attitude).
Co-creation	Refers to a business strategy focusing on customer experience and interactive relationships that encourages, and allows, the involvement of the customer in the creation or development of new value.
Developed country	Refers to a country that typically has high economic activity and its people generally have high incomes (for example, the USA).
Developing Countries	Countries that have low living standards, an undeveloped industry base and where people generally have low incomes (for example, South Africa).
Digital financial services	Refers to the delivery of banking services outside the traditional bank branch system utilising technology as a medium.
Digitally unbanked	Refers to persons that have no access to a bank's digital/electronic banking services, such as a person that only has a bank account but cannot access the banks' e-banking services for reasons such as the lack of the requisite equipment (e.g., computer or a smart phone).
Digitally unbanked seniors	Refers to persons that are 60 years and above that have no access to a bank's digital/electronic banking services.
E-banking	For the purposes of the study, e-banking entails the remote electronic provision of banking and related services either via a modem, mobile handset, a computer or any electronic devise. Therefore, for the purposes of the study, the term e-banking includes m-banking.
Financial exclusion	Refers to a process whereby there is the unavailability, or lack of access, of financial services to sectors of a society (typically to vulnerable groups in the society such as the poor, elderly and certain racial groups).

Financial inclusion	Refers to the process that entails improving the range, quality and availability of financial services and products to the unserved, underserved and financially excluded persons.
M-Banking	Refers to the remote delivery of banking services electronically via a mobile phone device.
Theoretical foundation	Entails the critical review of the theoretical elements that form as a frame of reference of the study.
Seniors	Means the elderly, or old persons, whom for the purposes of the study, are categorized as persons that are 60 years of age and above.
Unbanked	An unbanked person is a person who does not use, or has no access to, commercial banking.
Under-banked	An under-banked person is a person who has limited access to commercial banking services and/or products, such as a person that has a bank account but cannot access the bank's credit facilities because of reasons such as a poor credit rating.

CHAPTER 1

THE STUDY IN CONTEXT

1.1 INTRODUCTION

Information Communication Technology (ICT) is increasingly changing the way banks conduct business. The advent of the Internet of Things (IoT) which has opened the door for the interaction between *things* and humans, wherein devices are interconnected and possess contextual awareness, as well as autonomy (Dias & Ferreira, 2018), means that the role ICT's in banking is expected to increase. Large bank branch networks characterising yesterday's competitive advantage are now becoming obsolete because of ICT driven e-banking innovations (Belay, Mengesha & Gebriel, 2016).

While the benefits of e-banking are recognised, customer's adoption of these services is still a notable challenge for the banking industry (Le, Nguyen, Ho, Nguyen & Le, 2018). Seniors are for the most part reluctant to use these services (Arenas-Gaitan, Peral-Peral, and Ramón-Jerónimo, 2015). Therefore, seniors stay either unbanked or under-banked, making their inclusion into the mainstream financial marketplace a problem for banks and a key research focus area. Banks also desire the reduction of costs associated with operating physical retail branches and aim to increase their market share (Raza, Naveed & Ali, 2017), so it is in their interest to see customers, including seniors, banking digitally.

In this research study, an analysis of the problems experienced by unbanked seniors to conduct digital banking was conducted and an empirical framework for banking this growing segment of the unbanked market was proposed. This study focuses on Internet and m-banking and it is meant to inform the development of e-banking systems that motivate, or convince, digitally unbanked seniors to use e-banking, thus facilitating financial inclusion. Extent literature attributes many factors to the reluctance of digitally unbanked seniors to adopt e-banking. However, the seniors' segments' participation in the system design lifecycle in co-creating e-banking appears to be neglected.

The modelled empirical framework proposed in the present study incorporates digitally unbanked seniors' bottom-up involvement in the e-banking process design and development. The factors addressed in the empirical framework have been identified in e-banking adoption theories and extent literature.

These factors include: co-creation, customer involvement; banks' initiative in capacity building, usefulness, trust, security and privacy, attitude, ease of use, cost, design and willingness to use e-banking. According to Zhang, Gable and Rai (2016), theory development lies at the core of the scientific research process.

In this chapter (Chapter 1), the study is contextualized. The chapter commences with a clarification of the concepts and terms used in the study as well as their operationalisation immediately after this introduction. Thereafter, a brief background to the study is provided, followed by the research problem, aims and objectives, research questions as well as the study's significance and contribution.

1.2 CLARIFICATION OF CONCEPTS AND TERMS

1.2.1 E-banking Defined in the Present Study

E-banking is a broad topic that is isolatable into different subsets. The incursions of new customers' remote channels of communication with the banks drive the various e-banking subsets (Maduku, 2014). Das and Dhar (2014) define e-banking as the remote electronic provision of banking and related services. The literature broadly accepts this definition (Kaur & Kiran, 2015; Gautam & Khare, 2014). However, the definition somewhat unjustly separates Internet banking and mobile m-Banking. M-Banking refers to the remote delivery of banking services electronically via a mobile phone device (Shaikh & Karjaluo, 2015).

Etim (2014) states that m-Banking can itself be classified into two components, the additive component wherein the user of a mobile phone device is able to access their bank account and make transfers as well as payments. The other component (Etim, 2014) is the transformative type wherein the mobile phone user is enabled to participate in financial services (such as sending money to third parties) without necessarily having a bank account.

Therefore, it is clear from these definitions that the characteristic distinction of e-banking and m-Banking is whether the remote contact with the bank is made via a modem, mobile handset or a computer. Based on these definitions, the additive component of m-Banking is proposed collectively with Internet banking in the broader definition of e-banking for the purposes of this study.

The motivation for this classification is that a bank's website is accessed when a customer connects to their bank account either via the Internet using a desktop computer for Internet banking or their mobile phone for m-Banking, and there are also similarities in the website look and feel as well as the transacting tasks and convenience benefits (Kaur, 2015). Consequently, e-banking in the context of this study, refers collectively to both Internet and m-Banking.

1.2.2 Digitally Unbanked Seniors Population Segment

An 'age cohort' refers to a group of people born around the same period of time from a particular population that typically shares certain events and experiences over their life course. The senior population segment refers to people who have reached the aging stage of life which is usually associated with the time in which a person is entitled to pension benefits (World Health Organization, 2015). However, in the literature varying ages are used to define age seniority, since this concept is subject to the various constructions relevant to each society (Walsh, Scarf & Keating, 2016).

Villajero-Ramos, Peral-Peral, Arenas-Gaitan, & Ramón-Jerónimo (2014) uses 55 years to define age seniority. Golant (2017) uses 65 years as the seniors' age category cut-off. The United Nations (2014) uses 65 years to classify age seniority. The present study defines seniors as people that are 60 years of age and above, based on the categorization by Vacek and Rybenská (2017). Thomas, Meena and Sundaram (2017) also used the 60 years cut-off to define age seniority and explained that this generation, born between 1906 and 1956, were born before the industrial revolution and their views on the ICT revolution were important to decipher.

The 60 years age classification of age seniority is also the official qualification age for South Africans to receive state-aided old age social security grants disbursed by the South African Social Security Agency (SASSA). Many SASSA old age grants beneficiaries collect their social security grants in cash at thousands of SASSA pay-points in South Africa, because they are classically and digitally unbanked. These digitally unbanked seniors constituted the study's population.

1.2.3 Digitally Unbanked: Unbanked and Under-banked

The unbanked and under-banked refer to two distinct groups of people that are excluded from participation in the financial marketplace. An unbanked person is a person who does not use, or has no access to, commercial banking (World Bank, 2014). People belonging to this group are also deemed to be classically unbanked. Therefore, the departure point of this classification is that the person does not have a bank account at all and relies on other alternatives for their financial needs.

The under-banked, on the other hand, are people who have limited access to mainstream commercial banking (Masamila, 2014). A person who only has a bank account but cannot access the banks' other financial products, such as a mortgage loan as a result of a poor credit score, is under-banked. Equally, a person excluded from using banking services such as e-banking is considered to be under-banked (Banking Association of South Africa, 2014).

A common denominator of the unbanked and under-banked is that they are people who, by choice or circumstance, operate partially or completely outside the banking system (Koku, 2015). Thus, the present study describes digitally unbanked seniors as a collective reference to elderly people (seniors) who operate partially (*viz.*, not using e-banking) or completely outside (not having a bank account) of traditional banking. This was the present study's target population.

1.2.4 Financial Inclusion

A literature review demonstrates that there is no universal definition of financial inclusion (Anwar, Uppun & Reviani, 2016). Garg (2015) states that financial inclusion is the delivery of appropriate financial services at an affordable cost to vulnerable groups. The World Bank (2014) defines financial inclusion as relating to the share of people and firms in all various forms of financial services. Similarly, varying definitions are used to describe financial exclusion. The US Postal Services Inspector General (2014) uses the term the financially underserved. Cnaan, Moodithaya & Handy (2012) argue that financial inclusion is not a monolithic subject and should be understood from many perspectives.

According to the Banking Association of South Africa (2014), financial inclusion entails improving the range, quality and availability of financial services and products to the unserved, underserved and financially excluded. This is the definition applied in the present research study, because it is more encompassing, since it does not only address issues of access, but it also include aspects of the quality of the services. The rationale is that, if the quality of financial services such as e-banking is not developed to suit digitally unbanked seniors, then that festers this segment's exclusion from financial markets.

1.3 BACKGROUND TO THE STUDY

The interest in the present study is informed by the growing demand for the global banking industries to bring the unbanked people into the financial marketplace, the banks' investments in e-banking to save operating costs as well as the researcher's professional circumstances. Equal participation in financial services by the unbanked is a critical indicator of economic inclusion, especially in less developed countries. Therefore, the continued digitization of services in the banking sector tie developing countries' financial inclusion solutions to e-banking. As Agyekum, Locke & Hewa-Wellage (2016) state, digital financial services are the developing world's financial inclusion bridge.

The researcher works for the South African Post Office Group (SOC) LTD and his employer is in the process of acquiring an operating license from the South African Reserve Bank for a state-owned bank (Postbank), specifically to bank the financially excluded. Until recently, Postbank has been a deposit taking bank operating in terms of the South African Postbank Act number 9 of 2010 (Donnelly, 2016). Parliament is now fast-tracking the corporatisation of Postbank. A private members Bill [Banks Amendment Bill, B 12 - 2018] is tabled in Parliament by the Economic Freedom Fighters' Party Parliament Chief Whip, Floyd Shivambu, for the amendment of the Banks Act to facilitate this process (Hansraad, 2018).

The business models of the global commercial banks are not designed to serve the poor (Le et al. 2018). In South Africa, the commercial banks align to these practices (PWC, 2018). In the majority, the people that are excluded from participating in the financial services includes the poor and poverty stricken (Park & Mercado, 2015). The World Bank (2014) states that the general characteristics of the global unbanked includes the unemployed, disabled, low-income earners and seniors. The present study focuses on the seniors' category, and specifically those who are digitally unbanked.

Efforts to bank South Africa's unbanked with low-cost accounts started in the early 1990s. Consequently, financial inclusion in South Africa has increased to 70% of the population (Louis & Chartier, 2017). However, despite this progress a lot of challenges remain. In particular, getting digitally unbanked seniors to use e-banking is still a challenge (Koku, 2015).

Furthermore, the World Bank (2014) states that most low-cost bank accounts opened for South Africa's unbanked are now dormant, questioning the claimed figures representing the country's financial inclusion status. All forms of financial exclusion leave people out of the economic fibre (Louis & Chartier, 2017). Ikhide (2015) observes that the commercial banks' dominance of the developing country's financial industries is the main cause of financial exclusion. Nevertheless, e-banking is theorised to be the bridge for the world's unbanked to participate in financial services (Christopher, 2015).

1.3.1 The World Unbanked

The global financial services are far from being inclusive. Louis and Chartier (2017) state that the 2003 Keynote Address to the General Assembly by former UN Secretary-General Kofi Annan put the global spotlight on the challenge of the unbanked. The unbanked constitute approximately half of the world's adult population (World Bank, 2014). The unbanked challenge affects both developed and undeveloped economies in varying degrees (Ikbal, 2017). However, nearly 2.2 billion of the financially excluded people live in underdeveloped countries in Africa, Asia and the Middle East (Koku, 2015).

1.3.2 The Unbanked in Developing Countries

In most developing countries, especially Asia, Africa and the Middle East, many people are excluded from the financial systems. Of the 2.5 billion unbanked and under-banked people worldwide, nearly 2.2 billion live in underdeveloped countries (Gilman, Genova and Kefferberger, 2013). The diffusion of financial services vary from country to country. For example, China only has 70% of its adult population banked, 68% in Brazil, 53% in India, 40% in Tanzania and 36% in Indonesia (World Bank, 2014).

According to Ikhide (2015), the number of people in Africa that have at least one bank account has increased, but there are still challenges with usage as a result of the service costs to consumers. Only 23% of adults in Africa are banked, but the numbers vary from country to country, with Southern Africa having a 51% banked population, while countries such as the Democratic Republic of Congo's unbanked population being approximately 95% (iVeri, 2014).

Less than 20% of adults with a bank account in Southern Africa have access to credit with a formal banking institution (Gilman et al. 2013). Therefore, the rest of the people with banking accounts seek credit from alternative sources, often at high costs of capital, making their financial inclusion only partial. And so, they are under-banked.

According to FinMark (2014), 14% of the adult population is financially excluded in South Africa. Despite the country being among Africa's leading economies, income and wealth discrepancies fuel inequality and disproportionate economic participation (Louis & Chartier, 2017). As a result, financial inclusion in South Africa is recognised as one of the pillars of inclusive economic growth and a bridge of societal inequalities (FinMark, 2014).

Ikdal (2017) lists six challenges of banking the unbanked in South Africa: (i) high banking fees, because South Africa's bank service fees are four times higher than those of banks in Germany, (ii) mistrust of banks' motives; (iii) concerns of fraud; (iv) the unbanked value a sense of community (they trust stokvels); (v) the banks require too much paperwork; and, (vi) most businesses are conducted informally.

According to Louis and Chartier (2017) one of the main obstacles to banking the unbanked people is that banks have defined financial inclusion as some corporate social responsibility effort. Innovations incorporating regulatory compliance matrices as well as capitalising on the latest technologies are necessary if universal financial inclusion is to be realised (Ikhide, 2015). In addition, regulatory policies that solely focus on transaction banking ignore core elements of financial intermediation, such as savings mobilisation, and which is not beneficial to the unbanked.

1.3.3 The Study Research Flow

In this study, Klopper's (2012) phases of research flow was applied (as seen in figure 1.1 below). In terms of the Klopper (2012; 2009) flow, going through the stages of research is an iterative non-linear process leading to solving the research problems. By following this approach (Klopper, 2012) several revisions were performed in between the research design, literature review, research methodology and data analysis and interpretation stages.

For example, in line with the construction of this flow (Klopper, 2012), when a research topic is chosen at first, it is generally treated as a tentative topic to give the study the foundation from which to launch itself and the final study's topic may be finalised at a much later stage. The non-linear approach in between the research phases in the Klopper (2012) approach also meant that when the study was in the literature review stage, the literature at times redirected the reformulation of the research problems, objective and aims.

The literature review phase involved reviewing existing literature on the various topics of the study to ground it theoretically (Grant & Osanloo, 2014). The researcher kept track of the literature in the various topics' fields to remain abreast with the latest developments, thus literature was constantly updated and old literature that was considered irrelevant were discarded.

The research design phase involved ensuring that suitable methods are applied in the research. A research design is the specific method a researcher uses to collect, analyse and interpret data (Wright, O'Brien, Nimmon, Law & Mylopoulos, 2016). Thus, taking into account factors stemming from literature, a quantitative research method was adopted as this method was deemed suitable for answering the research. The study's research design is discussed in detail in Chapter 4.

Since the main thrust of the thesis was an empirical analysis of problems experienced by unbanked seniors to conduct digital banking and modelling an empirical framework of factors important to e-banking this market, Structural Equation Modelling was utilised as the study's data analysis and interpretation method. Iterations were undertaken between the data analysis and the other stages of the research.

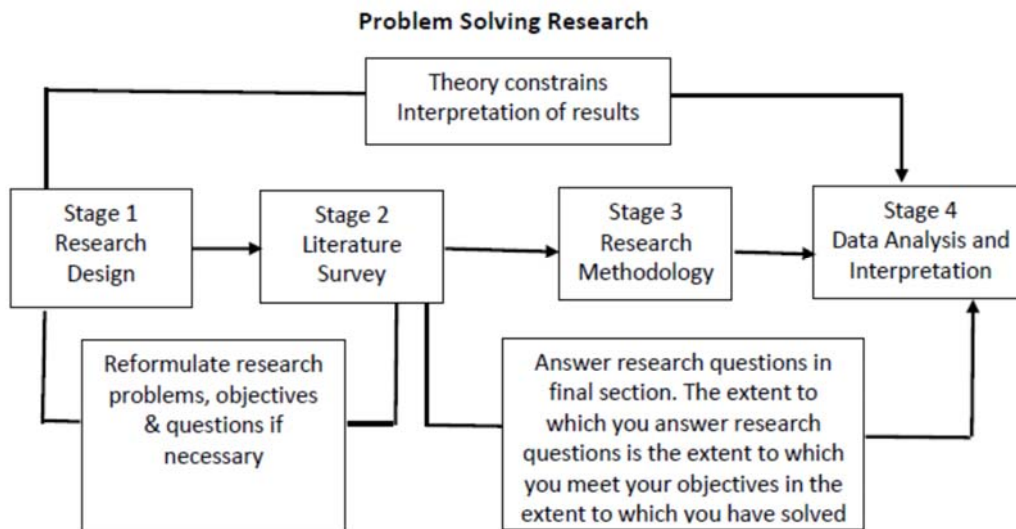


Figure 1.1: Phases of the research study (Adapted from Klopper, 2012).

1.4 PROBLEM STATEMENT

The global banking industries continue to invest in technological resources to provide customers services. In recent years, e-banking has grown to become one of the most predominant customer services technologies that banks have invested significant resources in (Ajanthan, 2018). The confidence in e-banking is that this innovation has potential for win-win outcomes for both the banking institutions and their customers (Perera, 2018). The success of e-banking is dependent on its adoption by its intended users, such as the digitally unbanked seniors. Therefore, the adoption of e-banking by seniors is an important area of research, especially from a system design and introduction perspective.

For the banks, e-banking is essential for lowering operational costs, increasing customer bases, mass customisation, improved marketing and customer communication and it is also a platform to develop non-core services (Singh, Singh & Bassi, 2017). To the bank's customers, e-banking is cited for its value to deliver a person's full control of their financial affairs through convenient all-hour banking that is accessible from anywhere (Agwu, 2017).

Importantly, e-banking is cited variously by Christopher (2015) and Asfaw (2015) as the solution to banking the unbanked, including digitally unbanked seniors, thus facilitating financial inclusion. In South Africa, commercial banks view e-banking as integral to their market growth strategies and as a means of reducing the costs of operating physical branches (Maduku, 2014). Therefore, the banks have a consigned interest in many of their customers adopting e-banking.

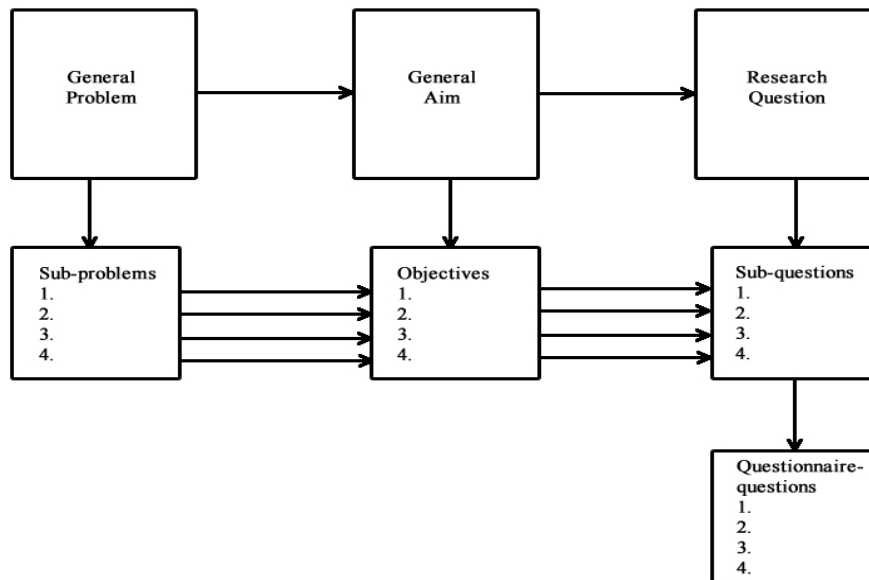


Figure 1.2: Alignment of research problems, objectives and questions (Klopper, 2009).

Figure 1.2 depicts Klopper’s (2009) research problem solving approach that was followed in the study. In terms of Klopper’s (2009) approach, a research problem is unpacked into various sub-problems which are inter-related and aligned to the study’s aim and objectives. After that, a researcher starts to formulate research questions that are aligned to each objective.

1.4.1 General Research Problem

A disconnect has occurred, and continues to exist, between the extensive roll-out of e-banking by the banks in South Africa and the digitally unbanked seniors’ reluctance to adopt the services. Therefore, banks think according to distribution channels while their customers have divergent motivation (Alwan & Al-Zu’bi, 2016). Essentially, e-banking seems destined to become a permanent feature of banking for the foreseeable future while digitally unbanked seniors are reluctant to use it (Arenas-Gaitán et al. 2015).

Inopportunately for the banks, the seniors group is the single highest growing population segment globally (Golant, 2017) while their spending capacity is poised to be on the rise. Irving (2018) reports that the Bank of America's Merrill Lynch forecasts that the global spending power of the now elderly 'baby-boomers' generation will reach US\$15 trillion by 2020. In addition, approximately 34% of the US nation's wealth is held by people who are 65 years and older (Caboral-Stevens & Medetsky, 2014).

According to Lehohla (2017), South Africa's ageing index increased from 23 percent to 27 percent between 2001 and 2015, confirming an increasing elderly persons' population in this country. This trend mirrors senior's population growth across the world, with nations such as Japan already experiences higher ageing population levels. Villajero-Ramos et al. (2014) noted that while seniors' household income may decline due to retirement, their individual incomes do not change significantly and some receive sizeable pension pay-outs, which make them a lucrative market for the banks. Therefore, the rejection of e-banking by seniors, whether from the perspective of the unbanked or their already banked counterparts, is a problem for the banks.

Digitally unbanked seniors' reluctance to use e-banking also has consequences that are beyond the loss of convenient all-hour banking. South Africa's digitally unbanked seniors are susceptible to the penalty of paying significantly higher transactional banking costs than their peers who bank online. Hesse (2015) reports that each of the commercial banks in South Africa have specialised transaction banking packages designed for senior customers, which are positioned as lower, or zero, transaction costs accounts.

However, the reality is that a senior banking customer can only enjoy lower or zero transaction costs if they retain a certain substantial fixed minimum balance in that account, which is usually thousands of Rand, or it is required that they at least use e-banking (Hesse, 2015). Unfortunately, not all senior bank customers have substantial savings that they can retain in their bank accounts as minimum savings deposit, making e-banking the only resort to meet the criterion of lower bank transaction costs.

In addition, seniors generally prefer to use human contact-based in-branch services which are costlier.

Research by Ramavhona and Mokwena (2016) identified factors that include low levels of Internet penetration in Africa as responsible for the poor uptake of e-banking. However, the proliferation of mobile telephones in the past two decades has increased Internet access significantly. Pankomera and Van Greunen (2018) state that there are more mobile phone connections than the number of people in Southern Africa.

Nevertheless, the prevailing conditions demonstrate that e-banking adoption continues to be a major drawback for banks (Ameme, 2015). Therefore, many research studies have focused on understanding the adoption and use of e-banking from various perspectives, including the development of the related theories and models. However, Oliviera, Farai, Thomas & Popociv (2014) and Yousofzai (2012) points to the absence of a focus on the individual's differences and preferences alongside other factors in the investigation of e-banking adoption. Studying e-behaviour of specific groups provides the opportunity to establish their needs and wants (Alwan & Al-Zu'bi, 2016).

Similar to other customer groups, the e-banking use factors linked to digitally unbanked seniors are vital to the banks (Camilleri & Grech, 2017). Different theoretical approaches to e-banking adoption in existing literature have focused on system factors or customer personal factors (Gu & Wang, 2016), and even jointly incorporated both these factors (Tam & Oliviera, 2016).

However, no evidence of studies in a developing country context that have deployed seniors' participation, from the perspective of a bottom-up co-creation of e-banking services in the e-banking System Development Lifecycle, to study use exist. Yousofzai (2012) recommends that this area of research requires research attention. Creating awareness of e-banking benefits and providing usage support and empowerment by the banks is another factor that was identified as necessary when identifying customers' experienced challenges with e-banking (Edwin, Okpara, Ailemen & Mike, 2014).

Furthermore, e-banking adoption's theoretical approaches that are available in journals commonly focus on developed country's contexts and very few studies address developing country's environments (Baptista & Oliviera, 2015; Omotayo & Adebayo, 2015). Lin, Wu & Tran (2015) argue that literature related to developed countries may not be sufficient to explain the experiences of the developing countries.

Limited studies focusing on the context in developing countries are based on situations affecting Asian countries (China, Malaysia and India). Sabi (2014) conducted a comprehensive literature review of the developing country's e-banking literature between 2000 and 2013 and his findings show that most of this research has been carried out in Asia (47.9%, 90 articles), followed by the Middle East (42 articles, 22.3%), while Africa only accounted for 19.7% (37 articles) of the research. The present study's geographical focus is South Africa, and it is trusted that the study will address this research area gap that has been identified in existing literature.

The scarcity of literature regarding the theoretical approaches of e-banking adoption focusing on senior customers as a distinct customer segment is also relevant (Noori, 2015; Bryson & Atwal, 2013). Many e-banking theoretical approaches in literature adopt a generalist method whereby the net is cast wide amongst all banking customers as a single unit (Thoene & Kneubuehler, n.d). Meanwhile, age seniority is an important segmentation variable that should be considered when seeking to gain a full appreciation of the challenges experienced with e-banking adoption (Birdir, 2015). Durkin and Howcroft (2003) state that banks treat their customers as a single unit in the implementation of e-banking because banks are uncertain about the customer segments that e-banking is intended to service. That causes the failure to capture customer's varying requirements into e-banking systems designs.

1.4.2 Research Sub-Problems

The study aims to address the following sub-problems in its pursuit to answer the main research problem:

- The effect of involving digitally unbanked seniors in the e-banking system development lifecycle regarding their willingness to use it is unknown.
- The e-banking design requirements of South Africa's digitally unbanked seniors are still to be established.
- The support that digitally unbanked seniors require from the banks, from e-banking benefits awareness and empowerment in using the services, is still to be determined.
- Factors that are important to South Africa's digitally unbanked seniors' e-banking use are still unknown.

1.5 RESEARCH AIM AND OBJECTIVES

The aim of the present research study is to contribute to solutions of banking the digitally unbanked seniors in South Africa, thus facilitating financial inclusion and also assisting banks to save costs of operating branches. Given the research problems specified, the study's primary aim is an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking. Thus, as its main objective, the study seeks to identify ways that banks can convince digitally unbanked seniors (as defined in the study) to use e-banking.

1.5.1 Objectives

The following are the secondary objectives of the study in order to support the main objective:

- To determine the effect on willingness to use e-banking of involving digitally unbanked seniors in system development cycle of these services.
- To specify South Africa's digitally unbanked seniors' e-banking design requirements.
- To determine the effect of banks' e-banking awareness and empowerment efforts on digitally unbanked seniors use.
- To specify factors that are important to South Africa's digitally unbanked seniors' use of e-banking.

1.6 RESEARCH QUESTION

A study's research question is a fundamental core as it focuses the research, determines the methodology and guides all the stages of the enquiry, analysis and reporting (Khodabux, 2015). The present study seeks to answer the following primary research question:

What e-banking usage and system development process factors should the banks consider to convince digitally unbanked seniors to bank electronically, thereby assisting the achievement of financial inclusion goals?

1.6.1 Research Sub-Questions

- What is the effect of involving digitally unbanked seniors in the system development cycle on their willingness to use e-banking?
- What are South Africa's digitally unbanked seniors' design requirements of the banks' e-banking system?
- What is the impact of the bank's e-banking awareness and empowerment strategy on digitally unbanked seniors' use of the system?
- What are the adoption factors to motivate digitally unbanked seniors' use of e-banking?

1.7 DELIMITATION OF THE SCOPE OF THE STUDY

The demand for the financial inclusion of all marginalised groups informed the choice of this research topic that identified a research gap in the e-banking of digitally unbanked seniors in developing countries. For practical and logistical reasons, South Africa was identified as the study's focus location, because it the country of the researcher's primary residence. In addition, the researcher is familiar with the country's environment and the industry that is being studied.

South Africa is a developing country whose banking industry's deployment of e-banking is not yet advanced. Furthermore, the country has unique inequality dynamics that have left many of its citizens outside the mainstream financial marketplace, which perfectly suits the objectives of the study.

The population focus of the study was digitally unbanked seniors (as defined) in South Africa, thus limiting the participation to respondents in this country. The study utilised an interviewer administered survey questionnaire with a 5-point Likert Scale. This data collection method was deemed more suitable than a self-administered survey variation given the dynamics of the study's population.

For example, the majority of the unbanked seniors in South Africa are among previously marginalised groups that are generally not highly educated and able to decipher and complete a self-administered questionnaire unaided.

The Technology Acceptance Model, as well as constructs originating from other technology acceptance theories, formed the basis of the study's theoretical model.

Below is an Outline of the Thesis:

Chapter 1	Study in Context
Chapter 2	Theoretical Framework
Chapter 3	Literature Review
Chapter 4	Research Method
Chapter 5	Sample Demographics, Data Screening, Structural Model Testing, Results Discussion
Chapter 6	Recommendations

1.8 CONCLUSION

In this chapter, the study was introduced and put into context. The chapter commenced with a clarification of concepts and terms as used in the study as well as their operationalisation immediately after the introduction. Thereafter, a brief background to the study was provided as well as the research problem which is concerned with the continued rollout of technological solutions by banks, which presents a disconnection with the reluctance to adopt technology by seniors.

In this chapter (Chapter 1), the study's aims and objectives, research question and the study's significance and contribution were also discussed. The study contributes to the broadening of knowledge on the notions of e-banking adoption, especially in relation to seniors who are digitally unbanked, as well as financial inclusion.

The following chapter (Chapter 2) presents the study's theoretical framework. In Chapter 2, the theories forming the foundation of the current study's model are discussed. Chapter 2 concludes with the discussion of the model that was selected in the present study.

CHAPTER 2

THEORETICAL FOUNDATION OF THE STUDY

2.1 INTRODUCTION

In the previous chapter (Chapter 1) the background to the study was presented and the study was put in context. It was also explained that the present study sought to understand how the banks can improve the financial inclusion of the digitally unbanked seniors through, and by means of, the facilitation of their adoption of e-banking. This chapter (Chapter 2) theoretically frames the study within the broader relevant e-banking adoption theories and models in existing literature.

Grant and Osanloo (2014) are of the opinion that the theoretical framing of social research is derived from existing theory (or theories) in the literature that has already been tested and validated by others and is generally accepted as such in many works. Chapter 2 presents the study's conceptual framework derived from an existing body of work. It is within this conceptual framework that the theoretical foundation of the concept of involving customers in the design of e-banking is placed.

E-banking adoption literature is typically based on the theoretical assumption that certain factors play a central role in the disposition formations of users to use these ICT's for their banking. The primary aim of the present research study is to contribute to solutions of digitally banking unbanked seniors, thereby facilitating financial inclusion, as well as contributing to the research on e-banking adoption.

Consequently, the study's primary objective is to conduct an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking and contribute an empirical framework of how the banks can extend these services to digitally unbanked senior customers. Increasing the adoption of e-banking by seniors is seen as the solution for banking this financially excluded market (Kelly et al. 2015).

Seniors are financially excluded as a result of a number of factors, such as their decreased mobility due to aging, which limit their autonomy. In addition, the prevailing unsuitable financial products and services provided to seniors by banks leaves them out of the financial marketplace (Rajasekaran, 2018). In many cases, seniors are driven to the dependency on personal aids in the management of their financial affairs, making them susceptible to exploitation. The primary positive characteristic of e-banking services is their ability provide customers autonomous management of their financial affairs remotely from anywhere. The exercise of autonomy is necessary for human dignity and it is an underlying principle that governs every human right (Dabove, 2018).

The role of ICT in banking is increasing across the globe and banks have introduced a myriad of e-banking facilities to provide customers services. However, customers' adoption of e-banking is still a challenge, which has generated broad research interest (Bultum, 2014). Senior citizens as a customer segment have been found to generally resist new technologies, including e-banking (Shaikh & Karjaluo, 2015).

Many theories have been researched to explain e-banking adoption from a technological (functionality), social (social influence) or a user-orientated (ease of use) perspective (Saeed, Azim, Choudhary and Humyon, 2015). According to Hajiyev (2017) and Yousofzai (2012), e-banking adoption research conceptualisation mainly circles the following prominent theories: Innovation Diffusion Theory (IDT); Theory of Reasoned Action (TRA); Theory of Planned Behaviour (TPB); Technology Acceptance Model (TAM); Unified Theory of Acceptance and Use of Technology (UTAUT); Theory of Innovation Resistance (TIR) and Theory of Perceived Risk (TPR).

2.2 E-BANKING ADOPTION THEORIES

2.2.1 Innovation Diffusion Theory (IDT)

The IDT explains an individual's decision-making process on innovation. The IDT's factors are relative advantage, compatibility, complexity, observability and trialability (Akça & Özer, 2014). Rogers (1995) states that the innovation-decision process consists of five stages: 1. Knowledge (learning); 2. Persuasion (forming a more concrete attitude through sought information); 3. Decision (trying out); 4. Implementation (incorporating the innovation or rejecting it) and 5. Confirmation (seeking confirmatory evidence).

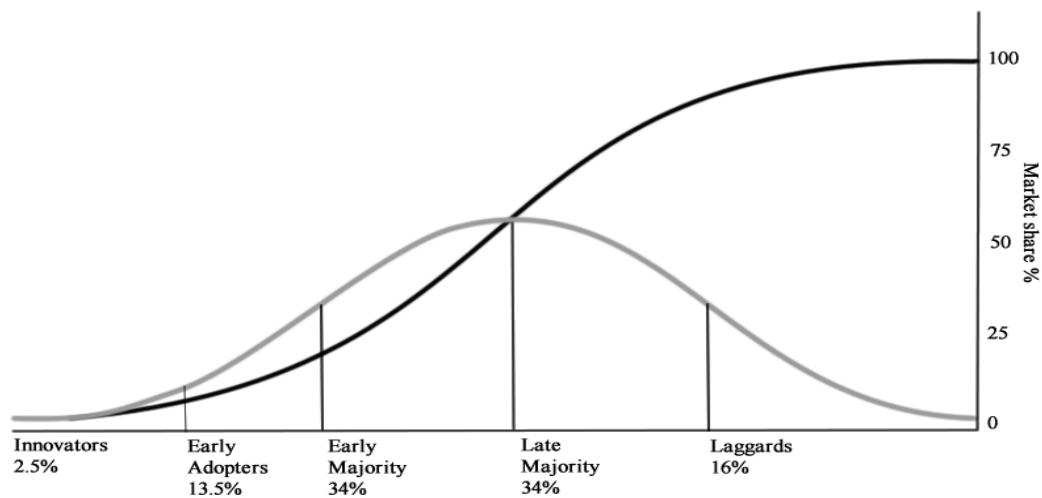


Figure 2.1: Diffusion innovation theory (Source: Akça and Özer, 2014).

The IDT constructs have been used in various ways, along with other theories, to assess customers' intention to adopt e-banking (Abu-Assi, Al-Dmour & Al-Zu'bi, 2014). Nasri and Zarai (2014) found that confirmation affects a customer's perceived ease-of-use of e-banking. Ozuru and Opara (2014) found relative advantage to have a positive impact on customers' e-banking adoption in Nigeria. M'Sallem and Mzoughi (2014) conducted a grounded theory study in Tunisia and their findings showed that the lack of knowledge about e-banking was the cause of resistance. Therefore, the creation of e-banking awareness by banks as a measure to increase use can be recommended.

2.2.2 Theory of Reasoned Action (TRA)

The TRA is a socio-psychological model that has commonly been used to explain e-banking adoption intention and behaviour (Kasim, Zani & Ali, 2014). The TRA provides a framework to study attitudes toward behaviour and has been used effectively to study dangerous behaviours, or behaviours associated with high risk situations such as e-banking adoption (Ali, 2016). For persons not familiar with e-banking, the services become high risk because of the fear that they may lose their money. It is common for people to resist innovation primarily because they fear that they may not apply it correctly (Kombe & Wafula, 2015). Risk in trying out new innovation can manifest as financial, social or performance related (Farzianpour, Pishdar, Shakib & Toloun, 2014).

According to Kasim et al. (2014), attitude is generally found in literature to be the strongest construct of the TRA. Mbrokoh's (2016) findings supported of the relationship between behavioural intention and use, with attitude being a strong factor.

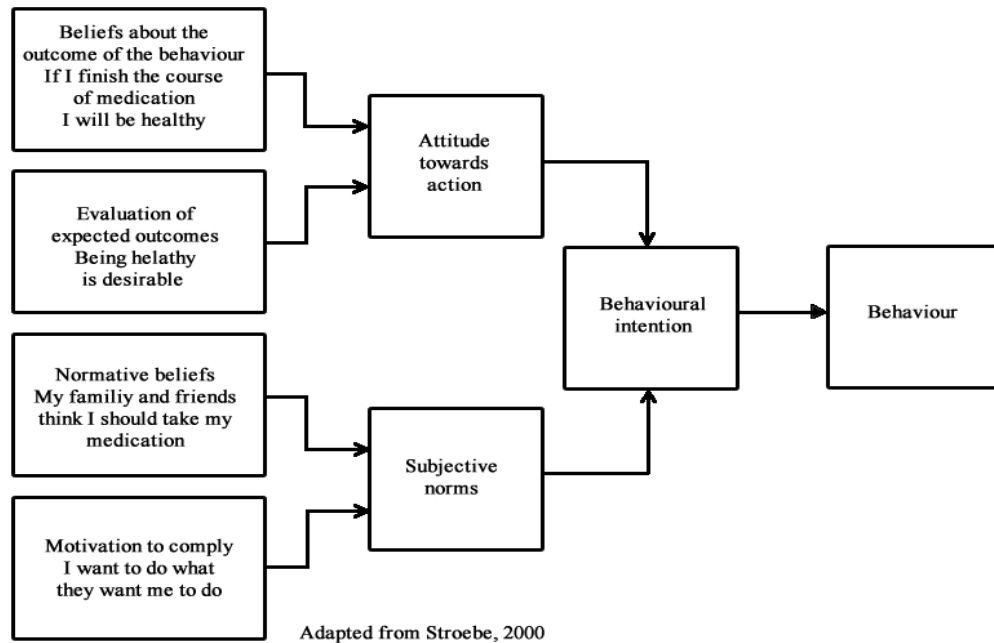


Figure 2.2: Theory of reasoned action (Source: Otieno et al. 2016).

According to Otieno, Liyala, Odongo & Abeka (2016), the TRA has been found to be strong in predicting adoption only upon addition of certain variables. As Bagozzi (2007) observed, the weakness of the TRA is that it ignores group, social and cultural aspects of consumer decision making as it bases prediction on simplified notions of human emotions.

The individual's wants and needs, group, social and cultural issues are the factors that findings of Omotayo and Adebayo (2015) recommend other research to consider alongside the psychology, behavioural, utilitarian and technological factors in order to attempt to understand the complex subject of e-banking adoption. Therefore, the TRA's constructs, in particular attitude, have only been largely used in research to supplement other theories.

A comprehensive literature review by Kasim et al. (2014) focusing on studies based on the TRA found attitude to be the strongest predictor of action in the financial services.

Ajzen (2002) defines attitude as the general manner of a person to consistently respond favourably or unfavourably to an object. In other words, the person's own personal calculation of the outcome of the behaviour, which impacts their attitude and shaping of their behavioural intention (Diako, 2011).

2.2.3 Theory of Planned Behaviour (TPB)

The TPB is premised on the construction that the most important determinant of a person's behaviour is behavioural intent (Diako, 2011). The TPB states that behavioural achievement is based both on motivations (intention) and ability (behavioural control) and subjective norm (Chuchuen, 2016).

Attitudes towards behaviour can thus be evaluated negatively or positively given that behaviour can be intentional. Perceived behavioural control is a strong factor to the TPB because its degree impacts the person's intention to undertake a behaviour (Ajzen, 2002: 1991).

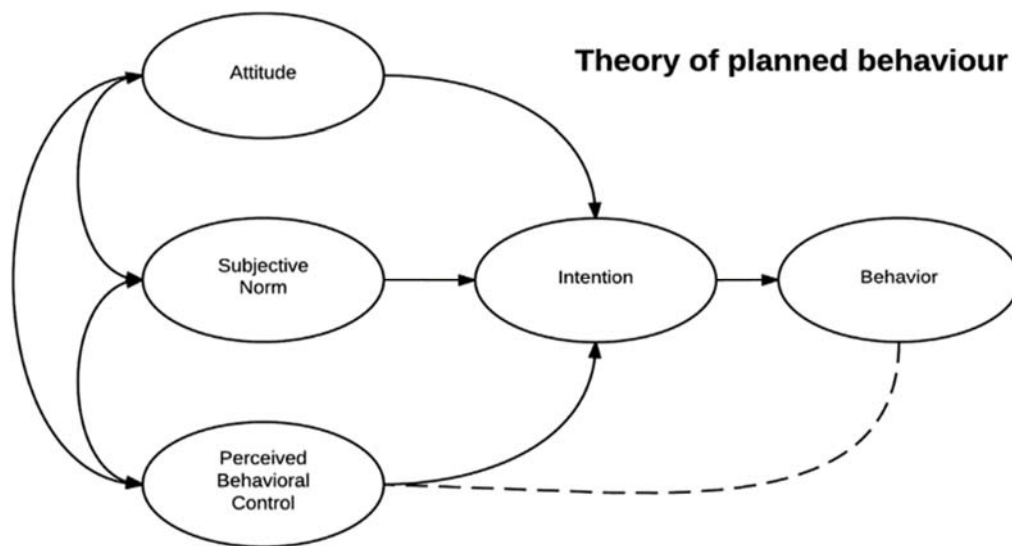


Figure 2.3: Theory of planned behaviour (Source: Alkailani, 2016).

The TBP extends the TRA and constructs of the two theories are used predominantly to improve the predictive power of other theories. Alkailani (2016) integrated the TAM constructs of PEOU and EU alongside modified TPB constructs to research e-banking use in Jordan and found predictive support for the model. The findings of Sankari et al. (2015) indicated that the intention to use e-banking was impacted by perceived behavioural control and subjective norm.

Taylor and Todd extended the TPB in 1995 to originate the Decomposed Theory of Planned Behaviour (DTPB) (Sahli & Legohorel, 2014). The DTPB infuses the TPB factors with the TAM and Innovation Diffusion Theory to derive better explanatory power (Baharun, Mirghasemi, Rahman & Awang, 2015).

In terms of the DTPB, to explain human behaviour, attitude is unpacked into three constructs that include perceived ease of use and usefulness (from TAM) and compatibility with innovation (from the IDT) (Fan & Tao, 2017). Moons and De Pelsmacker (2015) applied the DTPB to test users' intention to adopt Tesla's electric car in Belgium and the findings demonstrated the importance of human behaviour dimensions. Emotions, as well as attitude, were important to intention-to-use (Moons & De Pelsmacker, 2015). However, compatibility, lack of complexity and relative advantage influenced attitude (Fan & Tao, 2017).

Therefore, for ICT designs, such as e-banking, to attract new consumer market segments such as digitally unbanked seniors, they should incorporate factors that impact users' attitude positively. Human dimensions of users and other personal factors are important to attitude (Moons & De Pelsmacker, 2015). However, Balabanoff (2014) found no relationship between attitude and other personal factors.

2.2.4 Unified Theory of Acceptance and Use of Technology

The UTAUT proposes that the factors that influence a person's behavioural intention to technology are performance expectancy, effort expectancy and social influence (Williams, Rana and Dwivedi, 2015). In addition, facilitating conditions and behavioural intentions are other important factors of the UTAUT (Paula-Saumell, Forgas-Coll, Sanchez-Garcia & Robres, 2019). The UTAUT is regarded as the most comprehensive and robust theory when it comes to predicting users' adoption of technology (Mbrokoh, 2016).

The strength of the UTAUT is that it incorporates factors from well-established theories such as the TAM (1/2), TRA, TBP, IDT, Motivation Model, Model of Personal Computer Utilisation, Combined TAM and TBP and the Social Cognitive Theory (Ahmed, Kader, Rashid, and Nurunnabi, 2017). In addition, the UTAUT can be utilised to consider technology adoption and influencing factors such as age.

However, findings in the literature are mixed in terms of the predictive power of the UTAUT model. Mbrokoh's (2016) study focusing on e-banking adoption in Ghana

indicated that the UTAUT factors were significant in predicting adoption. The study's findings (Mbrokeh, 2016) also supported the relationship between behavioural intention and use.

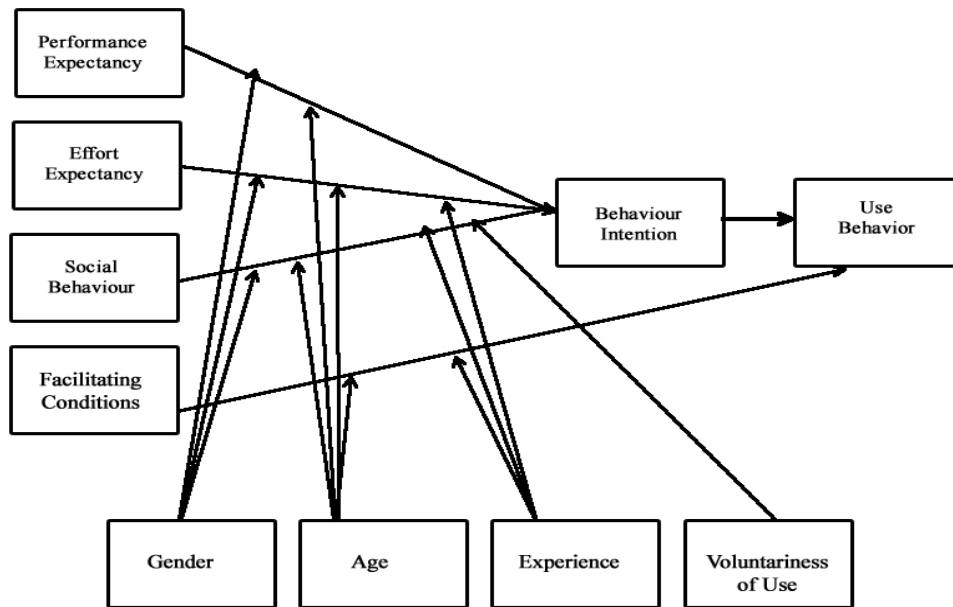


Figure 2.4: Unified theory of technology acceptance (Source: Mbrokeh, 2016).

Muhfuz, Hu and Khanam (2016) researched m-banking adoption in Bangladesh by inserting website quality into the UTAUT2 model and found that social influence and facilitating conditions were stronger predictors than website quality. Facilitating conditions can incorporate a system's suitability for users. Factors such system design suitability could facilitate users' intention behaviour to ICTs, such as e-banking, as would costs and access to Internet connectivity.

2.2.5 Theory of Innovation Resistance (TIR)

The TIR postulates that the reasons people resist innovation is the obstacles brought on to them by change, and the conflicts brought on by the innovation itself. In examining the reasons for resistance, the TIR proposes the following dimensions of innovation characteristics: user characteristics, and sales and marketing mechanism to understand the reasons people resist innovation (Dibrov, 2015).

Therefore, the TIR identifies barriers for users and these barriers are both functional and psychological. These are named perception barriers, including, usage barriers, value barriers, risk barriers, tradition barriers and image barriers (Chen, Tsai & Hsies, 2018). The functional, or usage, barrier refer to the perception barrier of consumers who are concerned that they may not be able to apply the innovation efficiently as the innovation is not compatible with their workflows, practices and habits. The value barrier is concerned with the proposition that people will only move to the new innovation if they perceive it to have more value than the previous one (Kombe & Wafula, 2015). Therefore, the value barrier will develop if people do not perceive the innovation to be of a higher value to the previous one and they would refuse it.

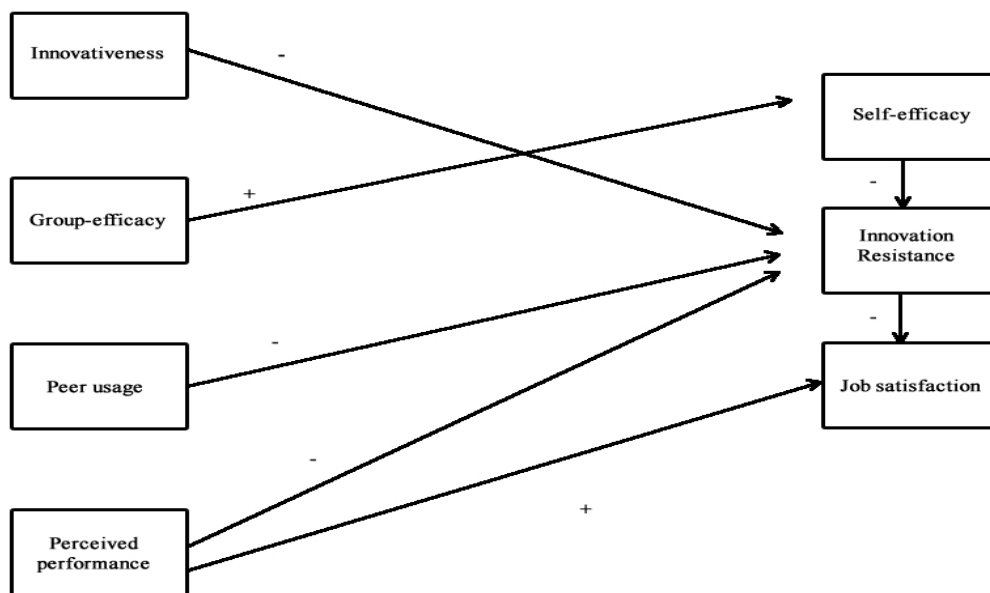


Figure 2.5: Theory of innovation resistance (Source: Kombo and Wafula, 2015).

The uncertainty accompanying the new innovation, which generally leads users to postpone it until such a stage that they have fully appraised it, generates the risk barrier (Ram & Sheth, 1989). It is only when the users do not perceive unwarranted harm to themselves that the risk barrier subsides. The tradition barrier is concerned with the departure from what the users are accustomed to or their traditionriers when evaluating the adoption of an innovation (Dibrov, 2015). Therefore, a deviation from known concepts that users are accustomed to causes resistance of innovation (Chen et al. 2018). Image barriers emerge when users attract stereotypes when adopting an innovation as they are concerned about how their social standing is perceived.

In their study in Kenya, Kombe and Wafula (2015) found the TIR to be effective in identifying the resistance of users to e-banking. In particular, because the framework of their study incorporated the TIR with TAM's PEOU and EU, found that in addition to the predictive power of the TAM constructs, users' resistance to e-banking was strongly found on users' tradition, which is a TIR measure. Different bank customer segments, such as seniors, would have their own unique set of traditions that require to be understood to ensure the successful acceptance of e-banking services.

2.2.6 Theory of Perceived Risk (TPR)

A person's risk that is associated with their action can become a barrier for them undertake the action. That is the founding principle of the TPR. The TPR has been used since the 1960s to determine people's behaviour, including the research of consumer decision-making (Ezzi, 2014). TPR research identifies several components of perceived risk, which may vary according to context. According to Farzianpour et al. (2014), risk can manifest as financial, social, performance or opportunity costs as a result of time loss.

With regard to the adoption of e-banking, security risk could manifest due to factors such personal identity theft. Performance risk can be linked to the malfunctioning of the e-banking system as expected (Ezzi, 2014). Financial risk identifies the probability of money loss (Farzianpour et al. 2014).

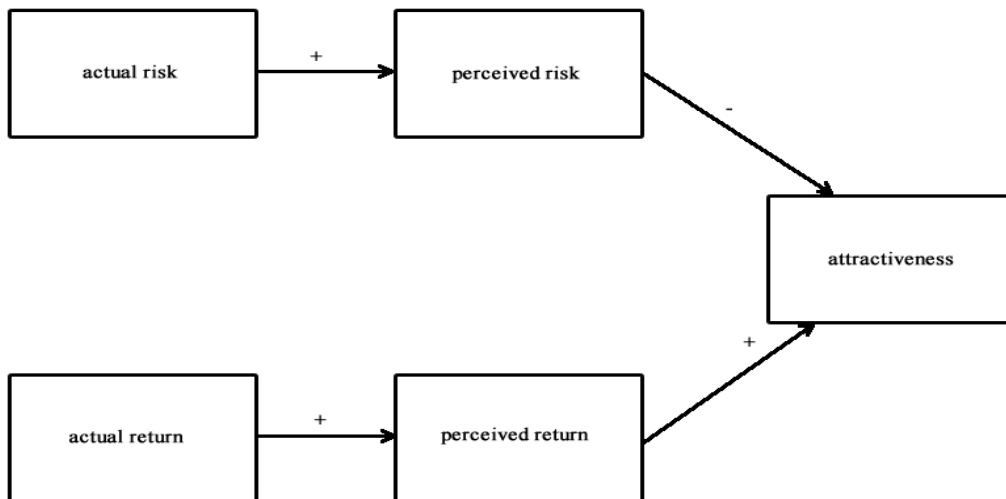


Figure 2.6: Theory of perceived risk (Source: Santos and Murtini, 2014).

Social risk, on the other hand, defines the adopting product or services cause to potential loss of social standing among peers whereas time risk is the outcome of the consumers losing personal time, for example in wrong decision-making when purchasing, searching for information, or figuring out how to use the system (Santoso & Murtini, 2014). Since the TPR departs from the perspective of consumers' shield from an unwanted outcome when they make a purchasing decision, trust becomes a key framing component.

Ezzi (2014) found that perceived risk mediates the relationship between trust and trusting behaviour on e-banking. For example, in situations where users perceive that the banks will not take advantage over them, then the user's trusting behaviours towards e-banking increases.

2.2.7 Technology Acceptance Model (TAM)

The TAM explains and predicts users' acceptance of technology innovation and is the most common model used to investigate e-banking adoption in various geographic contexts (Mavetera, Moroke & Chibonda, 2014). According to Nagaraj and Singh (2017), Davis developed the TAM in 1986. Perceived Ease of Use (PEOU) and Ease of Use (EU) influences a person's intention to use technology, therefore they are the main predictors. These predictors also determine actual use of technology (Chen, Rong, Ma, Qu & Xiong, 2017).

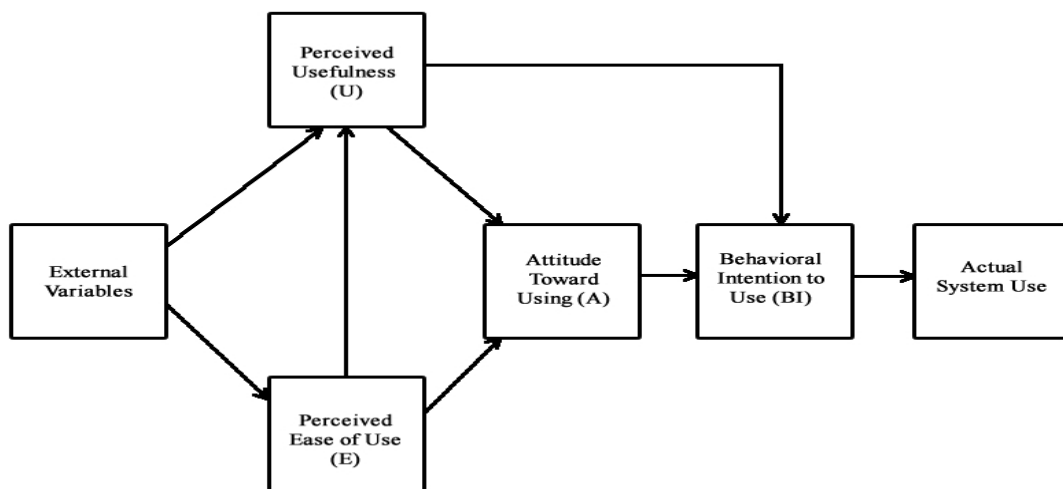


Figure 2.7: Technology acceptance model (Source: Gao and Bai, 2014).

Nagaraj and Singh (2017) found the TAM's constructs to be strong in predicting e-banking adoption. The TAM has also been extended many times by researchers that incorporated external factors in order to increase its predictive power. Khurshid and Tasneem (2014) combined perceived trust, service quality and perceived risk with the TAM constructs in their e-banking study focusing on customers in Pakistan. Their findings supported the predictive power of PEOU and EU on attitude to use e-banking.

Brar, Sharma and Khurmi (2014) combined the TAM with the TPB to study e-banking adoption in India and their findings confirmed the predictive power of PEOU and PU on usage, including the effect of perceived behavioural control on intention. Shaikh and Karjaluoto (2015) reviewed m-banking literature and established that many studies are based on the TAM antecedents, and that PU, compatibility and customer attitudes affected intention to use.

The advantage of the TAM is that it is parsimonious, it is technology focused and it is a utilitarian model (Gao & Bai, 2014; Yousofzai, 2012). Chen et al. (2017) applied the TAM as their theoretical framework of their Model for Mobile Social Gaming Service Popularity utilising the social services WeChat as the basis for their study. The study found the TAM constructs among factors they added such social interaction, altruism and perceived enjoyment to be effective as predictors of use (Chen et al. 2017). Phuong and Vinh (2017) found the TAM construct strong in predicting user's acceptance of the Facebook Events page. Abdullah, Jayaraman, Shariff, Bahari & Nor (2017) found the TAM constructs reliable in studying a hotel online booking system. The TAM was later updated into TAM2 and TAM3.

Literature is replete with studies applying the TAM constructs of EU and PEOU because they are generally found to be strong in predicting a system's use (Maduku, 2014). The study by Rafique, Rizwan, Batool and Aslam (2014) found that PEOU affects attitudes towards customer-targeted electronic technology and their results also show that attitude is strong in predicting future intentions on technology. Mwiya et al. (2017) found that PEOU, EU, trust and attitude positively influence a customer's willingness to use e-banking. As a result of these findings, this study proposes that PEOU will have a direct positive effect on digitally unbanked seniors' willingness to use e-banking.

2.3 SYNTHESIS: E-BANKING ADOPTION MODELS

E-banking research literature, either viewed from the perspective of the technology diffusion and adoption theoretical approach, or the technology resistance perspective, demonstrates numerous factors impacting customers' use of these services. Generally, a review of literature demonstrates that many studies tend to adopt the diffusion innovations and adoption theoretical approaches as opposed to the resistance literature (Gautam & Khare, 2014).

Yu and Chantatub (2016) argue that explaining adoption alone cannot provide comprehensive understanding of e-banking, therefore the antecedents of resistance should be considered as equally important. The factors generally identified in literature applying earlier innovation diffusion and adoption theories in relation to senior customers' e-banking adoption include usefulness, PEOU, EU, trust, safety, awareness, cost and technology factors (Bhatt, 2016; Gautam & Khare, 2014). Effectively, similar acceptance factors appear across most banking technology adoption research. According to Wisdom, Chor, Hoagwood and Horwitz (2014) this is due to the interrelatedness that is genetic to the adoption and innovation diffusion theoretical approaches.

The TAM's antecedents, PU and PEOU, have especially been widely extended with personal factors in various theoretical models to increase understanding (Mavetera et al. 2014). The availability, or absence, of facilitating conditions impacting technology use, has also been a factor considered alongside the TAM. Furthermore, the individual's perceived self-efficacy has been considered jointly with the TAM (Fathema, Shannon & Ross, 2015).

However, many of the theoretical models that incorporate personal factors do not appear to incorporate customers' involvement in the development of e-banking as an adoption construct, be it from a SDLC perspective or a customer-centricity angle, especially in relation to unbanked senior customers. The general assumption in literature seem to suggest that the systems are developed as fit-for-purpose and all that is left to be understood is the influence of behaviours around the system's usage.

Gao and Bai (2014) propose an integrative model that incorporates technological factors (PEOU, EU and Trust), customer factors (perceived enjoyment and perceived behavioural control) and social factors (social influence). While the model (Gao & Bai, 2014) comprehensively considers e-banking adoption by integration system, social and

customer factors, the model assumes that the e-banking technology is ideal in its existing form in which it is presented to the customers.

The theoretical model by Ezzi (2014), Consumer Internet Banking Model (CIBM), introduces perceived privacy, trust, computer-self efficacy, responsiveness and demographic factors to e-banking understanding. Therefore, this model, which is framed on the TAM, incorporates both technology and customer factors in the investigation of e-banking.

While the CIBM model incorporates customer factors, as well as IS constructs, it does not incorporate the involvement of customers in the design of e-banking. Similar to most e-banking models, the CIBM assumes that all the important aspects of the e-banking services have been sufficiently considered by banks and the outstanding aspect is to identify other reasons that prevent customers from adopting them.

Tam and Oliveira (2016) propose a model that provides practical insights for banking managers and researchers to improve the adoption of e-banking. Their model incorporates Task Technology Fit, DeLone and Mclean Information System success model measures and the service quality construct. Tam and Oliveira (2016) argued that some items are important in e-banking.

Their model (Tam & Oliveira, 2016) provides insights into the idea that customers are enabled to perform banking tasks with minimum effort and time, which is beneficial to their wellbeing. Therefore, the model (Tam & Oliveira, 2016) jointly incorporates system factors and personal factors, which literature by Gao and Bai (2014) recommend as the ideal approach for framing research on the complex notion of e-banking. However, Tam and Oliveira's (2016) model does not specifically include the customer's involvement in the SDLC as a factor pertinent to unbanked senior customers' e-banking adoption and usage behaviour.

Mishra and Bisht (2013) present a theoretical model that mirror customer involvement. The theoretical model (Mishra & Bisht, 2013) does not specifically refer to customer involvement in the e-banking SLDC. However, the Mishra & Bisht's (2013) framework's proposal of a bottom up approach that involves the engagement of customers is a factor that ostensibly mirrors the steps associated with obtaining users' feedback during the SDLC (such as, in the Incremental model's iterative processes that consider customer's feedback at each stage). The problem with the Mishra & Bisht (2013) model is that the

unit of analysis is policy formulation for the purposes of achieving financial inclusion in India, and not e-banking adoption from the perspective of individual unbanked senior customers in South Africa.

Puriwat and Tripopsakul (2017) developed a model comprising the combination of the TAM and Mobile Service quality. This model by Puriwat and Tripopsakul (2017) considers the normal TAM factors of PEOU and PU, but what is interesting about it is the factors emanating from mobile service quality that include the friendliness of the e-banking design and aesthetics, sociality in terms of the user's benefits, practicality in enhancing human efficacy and enjoyment.

While the Puriwat and Tripopsakul's (2017) extended TAM model seems comprehensive in terms of the factors it considers, it does not incorporate customer's co-creation of the e-banking technology. Consequently, the model assume that the e-banking system's design is adequate and therefore understanding reasons for adoption by customers is the only outstanding factor.

Nouri and Soltani (2019) propose a hybrid model based on the TAM and incorporates customers' personal, social, organisational and technology factors, which makes it comprehensive for understanding adoption. For example, the model considers personal factors, such as age as well as social factors that include trust together with technology factors, such as security and risk collectively in the evaluation of customers' e-banking adoption.

However, the model does not factor in the involvement of customers in the design of e-banking. The Nouri and Soltani's (2019) model assumes that the e-banking system in its current form and as it is deployed in a top-down fashion by the banks is fit-for-purpose. However, involving customers in the co-creation of systems is an investment in customer-centricity (Vettelri, Uebernickel, Brenner, Petrie & Stermann, 2016).

Ahmed, Kader, Rashid & Nurunnabi (2017) model combines the UTAUT with the TTF to study mobile banking. The model comprehensively considers technology factors in the form of both technology and task characteristics to measure technology-task fit. In addition, the model considers personal factors in terms of performance expectancy, effort, social influence and facilitating conditions.

For example, personal factors that are considered in the model include age, which is accepted as a factor of influence in e-banking adoption. Despite its comprehensiveness however, the model does not incorporate user involvement in the design of the system.

Baroudi, Olson & Ives (1986) developed a useful model focusing on the involvement of users in the co-creation of information system (User Involvement and Information Satisfaction Theory). The co-creation users' involvement in Baroudi et al.'s (1986) model pertains to the involvement of users in all activities in the SDLC: System definition, system design and system implementation.

Baroudi et al. (1986) focused on system users within a corporate environment and not mass consumers as it would be anticipated with regard to the notion of digitally banking unbanked seniors. However, not only does this model prove that users' co-creation involvement in the creation of information systems increases its use, but it demonstrates that users' satisfaction with the system improves.

Gao and Bai (2014) notes that e-banking is complex and requires research looking jointly into system factors, customer personal factors, as well as their psychology aspects. The problem with many of the models is that they consistently adopt a stance that appears biased towards perceiving the existing technology as "desirable". This bias appears to ignore the possibility that users, such as digitally unbanked seniors, may well find the technology desirable, but resist adopting it purely from the basis that they do not find it suitable.

2.4 CONCEPTUAL FRAMEWORK MODEL

Figure 2.8 below presents the study's conceptual framework. Theoretically, the study is framed on a family of behavioural theories given its focus on the effect of factors on digitally unbanked seniors' willingness to use e-banking.

Consequent to literature reviewed specifically, the study's proposed theoretical framework is framed on the TAM, some constructs originating from the TPB, and TPR, while also incorporating constructs of customers' co-creation and involvement in systems design in the System Development Life Cycle to increase usage, particularly Baroudi et al. (1986) User Involvement and Information Satisfaction Theory.

The attitude construct used in the study finds its origins in the TRA (Ajzen, 2002). The willingness to use construct in the framework is also parallel to the TRA’s behavioural intention.

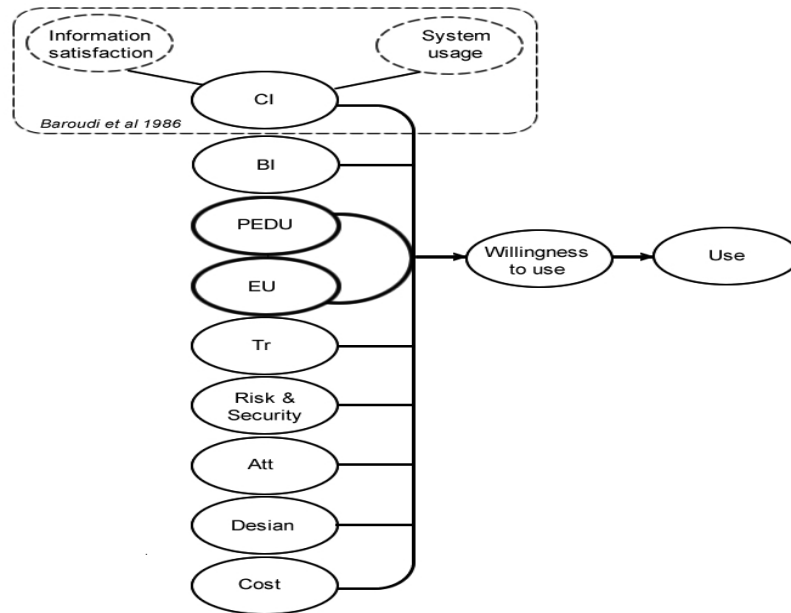


Figure 2.8: Conceptual model guiding the present study.

In essence, the original TAM constructs of PEOU and EU are retained in the study’s model. E-banking literature has generally focused its lens on the use and adoption of e-banking in context, with very little attention placed on how context shapes the innovation process and content of the services together with the user’s intention to adopt (thus affecting the very present focal factors of the research – use and adoption).

Contextual factors can be either geographic, or customer segment-focused, or individual such as the context of digitally unbanked seniors in developing countries. Effa and Nartey’s (2016) study of e-banking in Ghana found that contextual factors shaped the process of e-banking introduction in that country and forced it to deliver just basic information and account services rather than the intended advanced transactional, investment, interbank and payment services.

Therefore, the current study’s conceptual model considers personal factors (age seniority), social factors (perceived security and risk), and technology factors (design features and usability).

2.5 CONCLUSION

In this chapter (Chapter 2) various theories pertaining to the present research study were discussed. In this regard, this chapter explored the literature on e-banking theories and models designed to explain e-banking adoption. The critical discussion and synthesis of the application of the various models of e-banking adoption was presented in the chapter to demonstrate the general literature's treatment of the contextual issues in studies. It is from these discussed e-banking adoption models as well as existing literature that Chapter 2 provided the theoretical framework for the study. The chapter also placed the literature pertaining to the construct of involving users in the system design within the ambit of understanding adoption in the framing of the study.

The following chapter (Chapter 3) presents a critical analysis of the literature based on the various subject areas of the present study. Consequently, Chapter 3 presents literature on e-banking adoption, the notions of financial inclusion and financial exclusion, the categorisation of the digitally unbanked seniors as a customer segment. Furthermore, Chapter 3 discusses literature on customer involvement and the co-creation of systems, lifecycles of systems conceptualisation, development and deployment as well as the prevailing models.

CHAPTER 3

LITERATURE REVIEW

3.1 INTRODUCTION

In the previous chapter, the theoretical framework of the study within the prevailing e-banking theories was presented and the theoretical underpinnings of incorporating the notion of involving the customer in e-banking design was provided. In this chapter (Chapter 3) knowledge from existing literature on the study's various topics is presented.

Chapter 3 commences with a review of e-banking literature. Then, literature on digitally unbanked seniors follows and immediately thereafter the notion of financial inclusion and exclusion is discussed.

Literature on the notion of a customer's involvement in business processes, specifically in relation to their contribution to design or co-creation is discussed thereafter. The inter-related discussion of literature on the prevailing models of System Development Life Cycle and the placing therein of the notion of customer co-creation concludes the chapter.

3.2 CONCEPT MATRIX

In order to align the literature review with the research problems, the study extracted concepts from the problem statement which were then used to select relevant literature. The Klopper and Lubbe (2012) Concept Matrix (Figure 3.1) was used for this purpose. A concept matrix essentially serves as a literature review manager because it organises published information according to a particular chosen topic area, for example by age and the number of sources utilised.

Organising literature in this manner is necessary, because a literature review is not simply the summarisation of sources based on a particular topic. A literature review has an organisational pattern and includes both a summary and a synthesis, thus it involves the recap of the important information of the sources and a reorganisation, or reshuffling, of that information (Rhamdhani, Rhamdhani & Amin, 2014).

The benefit of a concept matrix is that it assists a research study to not be trapped within certain specific sources and to utilise only literature that helps solve the stated research problems (Klopper & Lubbe, 2012).

Personal Information

Student Initials and Surname: D I A K O B H
 Student Number: Z 2 4 2 1 0 1 0
 University: U N I S A
 Abbreviated Topic: B A N K I N G T E C N O L

Concepts	Concepts per source	Adoption of e-Banking/ICT's Revolution	senior citizen's technology adoption	Financial Inclusion	e-Banking Promotion & Awareness	Models of Technology Adoption	System Design	Customer Involvement in SDLC	Perceived Ease of Use of e-Banking	Perceived Usefulness of e-Banking	Technology Trust	Privacy and Security	Attitude	Costs
References														
Count		98	34	27	18	49	16	26	31	31	17	16	41	20
Abbad (2013)		1												
Abdullah et al. (2017)						1			1	1				
Abdou (2014)		1										1		
Abu-Assi et al. (2014)						1			1	1				

Figure 3.1: Present study's concept matrix (Adapted from Klopper and Lubbe, 2012).

3.3 E-BANKING

Information Communication Technologies (ICT's) have revolutionised banking. Banks have recognised that ICT's are essential in achieving competitive advantage, therefore technology's role in banking has become very strategic to banking operations (Raza et al. 2017). ICT's have helped banks improve efficiency and their effectiveness in servicing customers, enhanced managerial decision-making, workgroup collaborations and overall competitiveness (Rajesh & Palpandi, 2015).

Banks have also taken advantage of ICT's to multiply their channel strategies to remain competitive and satisfy various customers' needs. Figure 3.2 below presents the prevailing banking channel strategies.

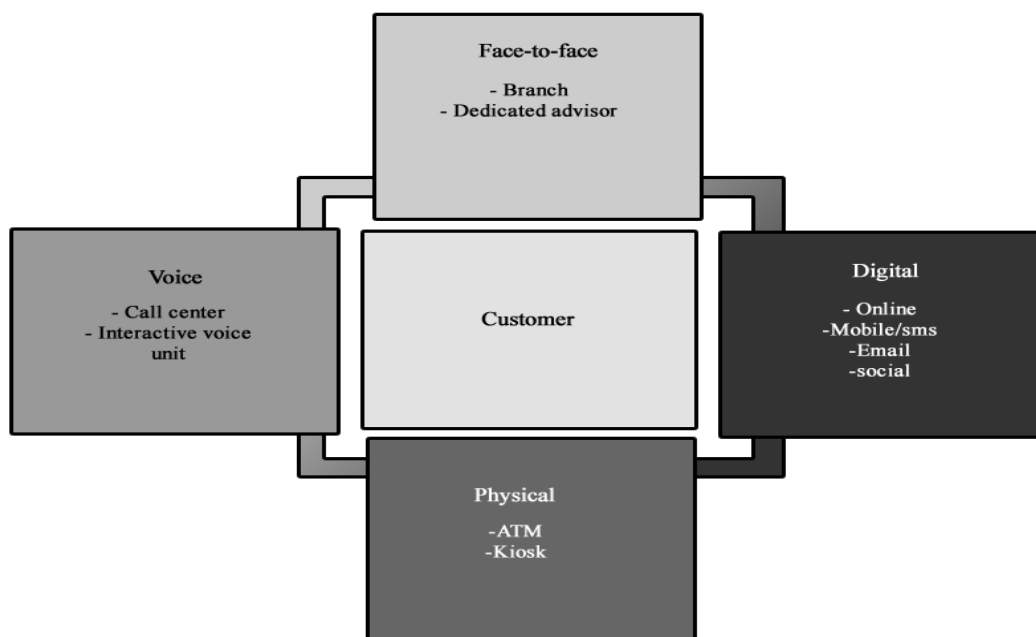


Figure 3.2: Banks channel strategy (Source: PWC, 2012).

Digital banking channels are the main ICTs to have fundamentally revolutionised banking to date (Addai, Ameyaw, Ashalley & Quave, 2015; Chandio, Iranib, Abbasic & Nizamania, 2013). According to Getembe, Magutu and Muro (2013), e-banking is reinventing banks’ strategies by combining technology, economic and market forces. As an umbrella term, e-banking means the remote provision of banking services to customers to make payments, transfers, account management and related banking services (Raza et al. 2017; Reis, Ferreira & Barata, 2013). Therefore, it combines communication and a distribution channel. The beginning of e-banking is dated back to New York in 1981 when City Bank, Chase Manhattan, Chemican and Manufacturers Hanover offered home banking using videotext (Dhananjay & Chandra, 2015). Table 3.1 presents a summary of the evolution of e-banking.

Table 3.1: E-banking evolution (Source: Dhananjay and Chandra, 2015).

Year	E-banking Evolution
1981	Start of home banking and use of videotext system
1983	Launch of online home banking by Nottingham Building Society
1994	Online bank by Stanford Federal Credit Union

When viewed from the IT perspective, e-banking generally forms part of a basket of transaction platforms that offer retail services (accounts management or bill payment) and wholesale services (B2B payments or commercial wire transfers) (Dhananjay & Chandra, 2015; Getembe et al. 2013). These are the categories within which the common features of e-banking fall (Hashika, 2017):

Transactional banking (performing financial transaction):

- Paying third parties
- Inter-account transfers
- Investment purchase or sale
- Loan applications.

Non-transactional banking (performing non-transactional functions):

- Account balance enquiries
- Viewing recent transactions
- Downloading statements.

The components of the e-banking system depend on the strategic objectives of each bank (Ezzi, 2014). Kapoor (2015) found that the banks in India deployed three basic e-banking components (including, “informational” – wherein the bank pushed product and services information to customers; “communicative” – whereby the customer is able to have some form of communication with the banking system, such as applying for a loan online; and “transactional” – whereby the customer is able to make online transactions).

E-banking embraces a number of electronic devices that include a personal computer, telephone, or a mobile device. Transactions conducted via the ATM and direct deposits to automatic bill payments are counted as additional e-banking subsets. According to Driga and Isac (2014), ATMs are the very early form of modern e-banking.

According to the Federal Reserve (2015) the following is a typical e-banking system flow (Figure 3.3):

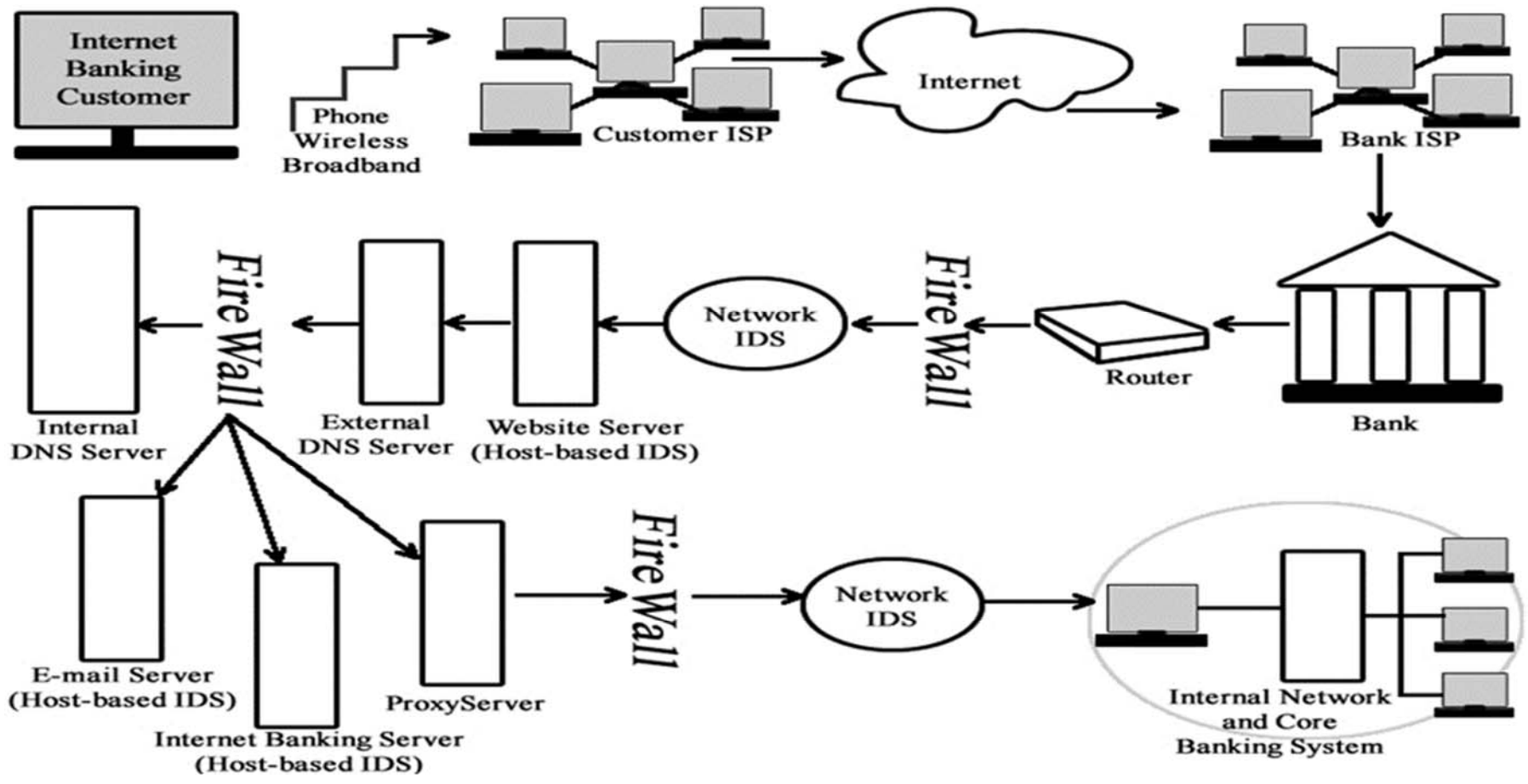


Figure 3.3: E-banking process flow (Source: Federal Reserve, 2015).

As a concept, e-banking includes the provision of financial services over a number of available electronic communication platforms. Figure 3.4 (below) presents the e-banking conceptual framework according to Driga and Isac (2014).

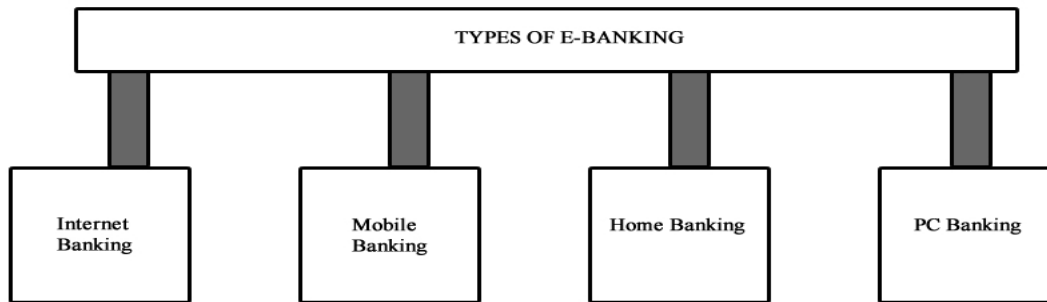


Figure 3.4: E-banking conceptual framework (Source: Driga and Isac, 2014)

Existing literature outlines various drivers and benefits of e-banking for both the banks and customers, making the services revolutionary. For the banks, the interest in e-banking is compelled by the need to cut operational costs, enhance customer loyalty and improve profitability (Munir, 2017). E-banking gives the banks increased efficiencies and the ability to scale borders (Driga & Isac, 2014). The interactivity of e-banking infrastructure also gives the banks cross-selling platforms (Goudarzi, Ahmad, Soleymani & Mohammadhosseini, 2013) as well as means to reduce queues in the branches (Driga & Isac, 2014). Customers' benefits from e-banking include convenience to access their banking at all times in a less costly manner (Kumar, Ariharan & Immanuvel, 2016). Using e-banking also saves customers time.

E-banking gives customers the ability to perform transactional (pay third parties) and non-transactional (view account balance) banking services from anywhere at any time of the day (Munir, 2017). Therefore, when factoring the ability to withdraw cash from ATMs, customers can do now with e-banking what they were used to in bank branches, and more, from anywhere in the world (Jehangir, Zahid, Shadi & Khan, 2016).

Hernando and Nieto (2006) argue that e-banking is not a revolution to banking but an additional delivery channel that will not necessarily replace traditional methods. Devulapalli and Oruganti (2017) and Chavan (2013) observe that while e-banking has proven ground-breaking to banking, it has also brought with it several challenges:

- The challenge to adapt global technology to local requirements, especially in developing countries
- Strengthening potential and current customers' support for e-banking
- Confidentiality and integrity concerns
- New trials for bank management and regulators, and cross-border regulation of financial transactions done on the net (including cross-border crime challenges).

Franco and Bulomine (2016) state that setting-up e-banking is prohibitively costly, thus breeding banks' anti-competitive conduct. This does not suit developing countries' markets as market-dominance abuse can wipe customers' benefits that accompany e-banking, such as low transaction costs. However, the low levels of use of e-banking by customers is the primary e-banking challenge for the banks, especially in relation to senior citizens or the elderly (Arenas-Gaitan et al. 2015).

3.4 SENIORS SEGMENT: BANKING THE UNBANKED

The World Health Organization (2015) states that most people globally can be expected to live up to 60 years and beyond. For example, a man born in the United Kingdom in 2020 is expected to live until 92 years of age on average (PWC, 2014). The positive impact of ICTs in medical sciences have resulted in these prolonged population lifespans worldwide. Consequently, senior citizens (people who are 60 years and above) have now become the rapidly growing population segment globally and an important customer cluster. This phenomenon is dubbed the "Agequake" because in 2015 there were 617 million seniors globally, and this figure will grow by 62% to 1 billion members of this age cohort by 2030 (Golant, 2017).

To illustrate the extent of this phenomenon, according to World Health Organization (2015), the Islamic Republic of Iran had a 10% aged population in 2015 and in 35 years, senior citizens will constitute 33% of this country's population.

In India, while the entire population growth was 17,7%, the year-on-year growth of seniors at the same time was 35,5% (Sakergayen, 2018). Global trends demonstrate increasing ageing among both males and females, changing the shape of the population pyramid.

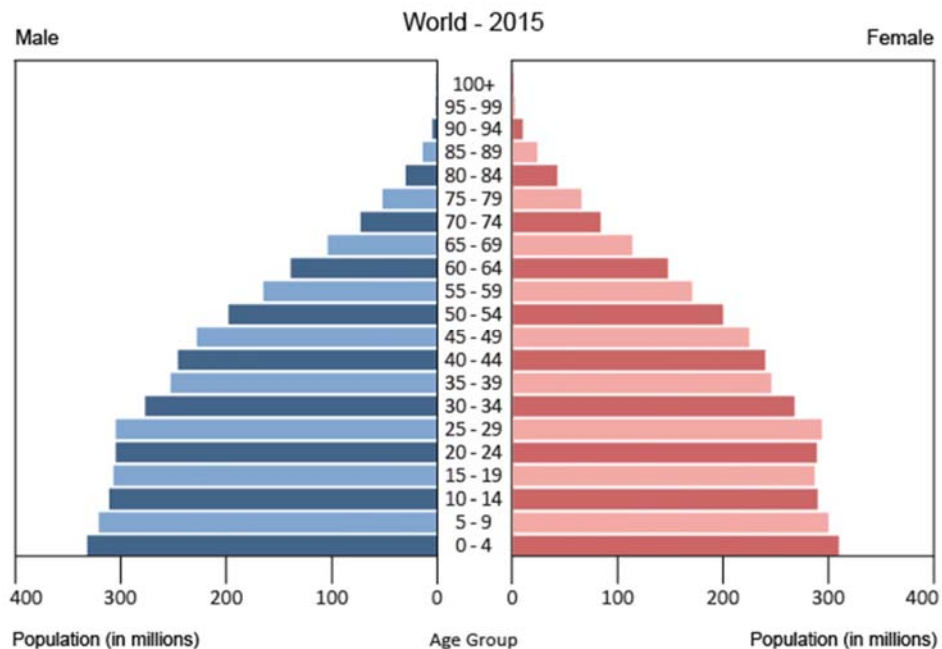


Figure 3.5: Ageing global society among females and males (Source: CIA World Factbook, 2017).

As fertility rates drop and the lifespans of people are increasing, both developed and underdeveloped countries will continue to experience a rise in the number of seniors. The new trend of ageism has prompted interest from business and cross many research disciplines. The population changes offer businesses opportunities to plan for the grouping of customers into clusters in order to provide each group appropriate and suitable products and services.

Customer clustering models allow businesses to identify potential clients according to the development criteria established by management (Gautam & Khare, 2014). Kelly et al. (2015) are of the opinion that to better respond to issues affecting the seniors' segment, there is a dire need to understand circumstances surrounding their economic, social and even physical positions. Therefore, this signals the need to implement changes adapting to the changing consumer market.

With regard to banking, the issue of age seniority is of great interest in so far as it impacts the adoption of banking technology as well as this segment's general inclusion into the financial marketplace (Shaikh & Karjaluo, 2014). Therefore, the banks' interest on the seniors' market segment is on two fronts surrounding their economic circumstances, which are the focal points of this study: (i) the issues of those members of the seniors' group that are under-banked (have limited access to financial services, such as those not using e-banking), and, (ii) those members of this social group who are completely unbanked, therefore requiring inclusion into the financial marketplace.

Technology banking holds the promise for bringing the unbanked and under-banked into full participation in the financial markets (Etim, 2014). Financial inclusion in relation to senior customers is important, because their incomes are unpredictable and participation in the financial marketplace can improve their means of better livelihoods (Kelly et al. 2015).

Population lifestyle models also predict an increased accumulation of wealth by people when they reach age seniority, especially in the beginning stages of this age milestone. According to Biggs (2017), the liquidity of most lifetime savings and investments in terms of pensions and retirement accounts are generally unlocked during retirement ages despite claims that most people do not have sufficient savings upon retirement.

Sonnet, Olsen & Manfred (2014) notes that the OECD (2014) also observes that in most high-income countries, age seniority is synonymous with a comfortable life derived from savings, as well as expanded working lifespans policy shifts, therefore making qualifying seniors a bankable lucrative market. Social security services also play an important role in the income of seniors. In South Africa, a comprehensive state-aided social security program ensures that Billions of Rands of monthly monetary disbursements are granted millions of seniors by SASSA when they reach the stipulated age.

As a category of customers, seniors have increasing spending power compared to other groups (Biggs, 2017). This customer segment demands greater quality in whatever they consume and prefer tailored products and services, such as products' packaging and labelling that suits them (Lesakova, 2016).

This is due to many factors, such as their decline in smell, taste, vision, inability to chew certain food stuffs, digest certain products efficiently or incapability to confidently control things, such as computers. This market segment also causes the rise for tailored banking products, such as investments and savings, as opposed to credit-based consumer products associated with the younger population (PWC, 2014). Senior customers also have the tendency to become loyal to a particular product or service that they consume (Karani & Fraccastoro, 2010).

However, despite noticeably high rates of global ageism, real-world financial systems are not inclusive and seniors, together with the poor, are among the most excluded (World Bank, 2014). The banks are the gateway to access financial services and they can play an important role in enhancing the financial inclusion efforts of vulnerable groups and, the inclusion of unbanked seniors, through technology innovations (Garg, 2015).

3.5 THE BANKING INDUSTRY IN SOUTH AFRICA

South Africa has a well-developed and regulated banking industry comparable to most developed countries in the world (Banking Association of South Africa, 2014). The banking industry in South Africa resembles that of the United Kingdom in that it has a reserve bank, commercial banks and mutual banks. The country's banking market is highly concentrated and controlled by four banks, Standard Bank, Nedbank, ABSA and FNB, the latter which control 85% market share. Capitec Bank, a new market entrant, has made a large impact in the lower segment consumer banking market and grown in stature and market share. The five banks therefore collectively control 91% of banking market share (PWC, 2012).

The five South African banks have total assets to the value of R5,14 trillion (Banking Association of South Africa, 2014). There are 30 international banks represented in South Africa, but the international banking institutions, however, are primarily focused in offshore lending, as well as treasury activities for corporate clients and government. The South African banks offer their customers a myriad of products and services, including deposit taking, credit and debt facilities.

South Africa's legacy of legislated discrimination has resulted in equivalent exclusionary practices in relation to financial services and capital in general. Consequently, the introduction of the Financial Services Charter in 2004 has resulted in the banking sector putting together efforts to refocus their attention to embody the intent emphasis on the

inclusion of the marginalised groups' access to financial services (FinMark, 2014). However, many of the industry's own transformation targets have not been met (Banking Association of South Africa, 2014). This is primarily due to the non-regulated nature of the self-imposed transformation imperatives of the banking industry.

Transforming ownership in the financial industry is also another contentious issue affecting the banking industry. The Financial Services Charter proposed funding of R100 billion to facilitate the sectors' ownership transformation which the National Treasury monitors annually. The establishment of a state bank to facilitate the poor's access to the financial markets is a further industry transformation factor (News101). In this regard, Government has passed the Financial Services Bill to facilitate the ownership of a bank by a state-owned company.

Despite the global standing of the South African banking industry, most low income customers do not have full participation in the financial marketplace, or they are completely excluded (FinMark, 2014). Many others do not have formal savings and operate in periphery savings systems such as *stokvels* and they are therefore financially excluded (FinMark, 2014). Seniors are among the financially excluded (World Bank, 2014)

In relation to e-banking, all the major banks in South Africa offer free e-banking services bundled into the individual account products they offer. South Africa has a banking population of 24,9 million customers and 14 million of these customers have access to the Internet (the country has 52% Internet penetration when mobile phones and devices are included) but only 2,3 million customers use e-banking (Mujinga, Ellof & Kroeze, 2018). Therefore, contrary to earlier research, Internet access is not a fundamental barrier to e-banking adoption.

3.6 THE CONCEPT OF FINANCIAL EXCLUSION

The notion of financial exclusion is broad and it refers to people's lack of access to a range of financial services (World Bank, 2014). The Banking Association of South Africa (2014) describes financial exclusion as the state where not all people enjoy access and use of appropriate financial products and services, the consequences of which is their inability to manage their money affairs effectively. These generally accepted definitions of financial exclusion mean that a section of society is discriminated against and prevented from partaking in the financial marketplace.

A financially excluded person is a person who exhibits any one of the following attributes: (i) has no basic banking account, (ii) accesses credit from informal sources, such as micro-lenders, and (iii) lacks a key financial product, such as a pension, savings product, or insurance. Therefore, financially excluded people pay more to manage their money affairs and cannot plan for the future (Dupas, Karlan, Robinson & Ubfal, 2018). Choudhury and Bagchi (2016), in exhibiting financial exclusion, identify broader definition of financial inclusion by indicating that financial inclusion is observable at individual, familial, and household levels and includes the following product types:

- Transaction accounts
- Savings accounts
- Financial advice
- Appropriate credit
- Insurance
- Home loans
- Superannuation
- Community enterprise financial support

Financially excluded people deal entirely in cash, and therefore are exposed to certain elements of risk, including irregular cash flows and the inability to undertake adequate financial planning for themselves and their families (Masamila, 2014). These people either keep their money at home for safe keeping or invest in illiquid assets, which hampers their economic growth. Therefore, having access to a banking account is important for their financial welfare and will improve their socio-economic circumstances, as they will earn interest and grow their banking profiles.

Many global development bodies such as the United Nations and the International Monetary Fund are advocating for banks to guarantee universal banking for all. The World Bank introduced several programmes setting financial inclusion targets to meet by year 2020 (Muhammadi, Dauda & Mamman, 2018). These initiatives primarily seek to ensure that every eligible adult person has access to a bank account. However, other literature sources argue that access to a bank account will have no impact on the economic welfare of the unbanked poor. The experimental study by Dupas et al. (2018) that tested the access to banking accounts for the unbanked in Chile, Uganda and Malawi found that, on average, this drive will have no material impact on the welfare of the poor.

Financial products and services that do not meet the needs of the customers also constitute exclusion from participation in the financial marketplace (Rajasekaran, 2018). Therefore, when certain products and services are only accessible to some sections of the society, because they demand a certain level of sophistication, then that causes a form of exclusion.

The lack of access to appropriate information to customers in relation to financial products and services can prevent some customers to use financial services (Masamila, 2014). Customers require information about the benefits of financial products and services in order to elicit appeal to their willingness to participate in the financial marketplace. However, Choudhury and Bagchi (2016) argue that credit exclusion is the most important and prevalent form of financial exclusion and it can present itself in the form of a complete credit exclusion, or credit inclusion and abuse.

High interest rates and other financial services charges can serve to exclude low income customers (Dupas et al. 2018). Basically, the interest-based system benefits those that have active capital to keep longer in the bank in order to earn interest at the expense of the poor. As such, interest is a barrier to financial inclusion because of its exploitative nature in relation to those who are at the bottom of the pyramid (Muhammadi et al. 2018).

Geographical factors, in this case distance, that affect the ability of people to reach the access points of financial services are also an exclusionary factor. Dupas et al (2018) found that there was evidence that strongly suggested that the further the people were to a bank, the less likely they were to use it, therefore confirming the effect of “access” as a barrier to the usage of financial services.

In economics terms, the issue of distance has been studied for decades and, for example, empirically shown to have effect on certain things, such as trade between countries. Accordingly, economics research shows that if the distance between countries is doubled, then that has the effect of cutting trade in half over time, a factor known as the “distance puzzle” (Brei & von Peter, 2017). In many developing countries, people have to travel long distances at a cost to access a bank, which is a factor that is prohibitive to their productive participation in the financial marketplace (Muhammadi, 2018).

Financial products and services that are not appropriately designed to cater for all customers are also a barrier to financial inclusion (Kapadia & Madhava, 2018). Therefore, financial exclusion is not just a geographic issue relating to the physical availability of a

bank branch within peoples' proximity. For example, if services, such as e-banking, are not designed to suit seniors, then the inevitable outcome is that these customers forfeit the benefits accompanying the innovation.

The criteria used to select people to qualify for certain financial products can further become a financial exclusion instrument. Often embedded in these criteria is things that include supporting documentation, such as proof of earnings from employment, which other people do not ordinarily possess. According to Kapadia and Madhave (2018) the following categories of people are generally financially excluded as a consequence of these criteria:

- The long-term unemployed
- Old aged people and pensioners
- Those excluded from earning due to sickness or disability.

Financial exclusion may cause wider social exclusion. For instance, financially excluded people will almost always find it difficult to access education, healthcare services and other life improving opportunities. These people generally remain trapped in poverty. Thus, poverty is one of the drivers of financial exclusion, especially in developing countries. In turn, financial exclusion is one of the many drivers of poverty.

The proactive plans to open the financial markets to all the systematically excluded people is one of the most important measures to achieve financial inclusion (World Bank, 2014). Financial exclusion can also be mitigated by financial capability and financial literacy on the side of the consumer, or appropriate financial products and services as well as the facilitation of access by financial institutions (Kapadia & Madhave, 2018). Financial inclusion also has to be supported by strong ethical market practices together with consumer protection regulations.

3.7 THE CONCEPT OF FINANCIAL INCLUSION

Financial inclusion means a state wherein all people have access to useful and affordable financial products and services that meet their needs and are delivered to them in a responsible and sustainable manner (World Bank, 2014). According to the Banking Association of South Africa (2014), financial inclusion entails improving the range, quality and availability of financial services and products to the unserved, underserved and excluded.

Therefore, financial inclusion entails making financial services and products (savings, payments, credit, transaction, insurance, etc.) available, including appropriate distribution mechanisms and criteria to all people indiscriminately (Rajasekaran, 2018).

People can be outside of the financial marketplace voluntary or involuntary. The World Bank (2014) classifies voluntary financial exclusion as that which involves an individual's decisions to not take part in financial services. In contrast, involuntary financial exclusion is not a matter of choice. Involuntary financial exclusion stems from factors such as poor credit profiles, low-income, unsuitable products and services as well as other similar factors that are out of the individual's control (Park & Mercado, 2015).

Dupas et al (2018) found that being involuntarily financially excluded was common among senior citizens, or the elderly. Immobility due to age can restrict their physical access to the banks, so this can become a deterrent factor. In addition, administrative requirements, such as the paperwork involved, can restrict seniors' participation in banking. Furthermore, the unsuitability of banking technologies, that should otherwise be ideal alternatives, prevent seniors' the opportunity to partake in the financial markets.

Including the financially excluded into mainstream financial markets is a global phenomenon affecting both developed and developing economies in varying degrees. The 2011 Maya Declaration adopted by 61 countries represents both an acknowledgement of the financial markets' inequities and a commitment towards financial inclusion goals (Abrahams, 2018).

Research by Anwar et al. (2016) and Chaia, Goland and Schiff (2010) has shown that globally, 2.5 billion people requires to be financially included (they are unbanked), and nearly 2.2 billion of them live in Africa, Asia and the Middle East. People needing to be financially included constitute approximately half of the global adult population (World Bank, 2014). The demonstrable developmental benefits associated with inclusion in the financial markets will continuously make financial inclusion a topical issue globally.

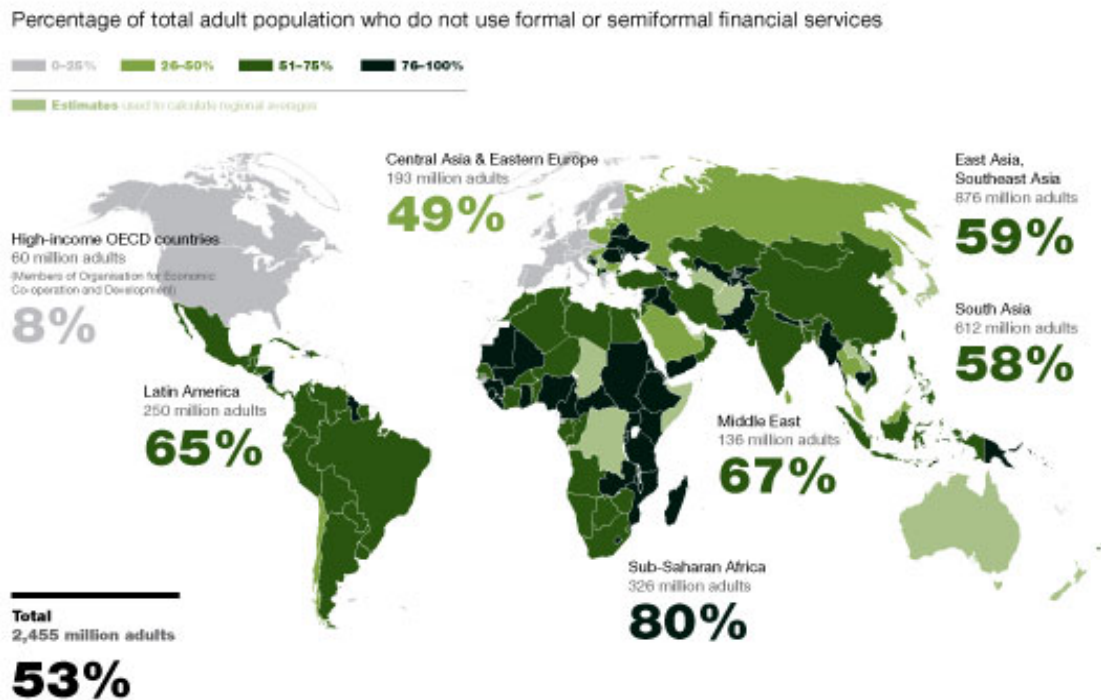


Figure 3.6: Global spread of statistics of the unbanked (Source: Chaia et al. 2010).

In Africa, only 23% of adults are banked and this percentage varies from country to country, with Southern Africa having a 51% banked population while countries such as the Democratic Republic of Congo's unbanked population being approximately 95% (iVeri, 2014; Gilman et al. 2013; World Bank, 2012).

In South Africa, according to FinMark (2014), 14% of the adult population is unbanked, or financially excluded (3.4 million). Abrahams (2018) argues that South Africa's sophisticated financial systems have assisted the country to fall short by only 1% to reach its National Developmental Plan goals of 90% financial inclusion targets by increasing figures from 61% in 2004 to 89% in 2016.

However, the present research study argues that South Africa's financial inclusion figures as reported by Abrahams (2018) and FinMark (2014) are distorted by millions of social security recipients cards issued mainly to the poor via the South African Social Security Agency that have limited, or quasi-banking, functions.

The social security cards, while allowing participation in the national payments system, do not accept third party deposits or credit deductions associated with a normal banking account, for example. Consequently, the holder of the card is virtually barred from participating in the credit market utilising the monthly state social grant income disbursed into the card as collateral.

In addition, South Africa's financial inclusion figures claimed by Abrahams (2018) and FinMark (2014) are distorted, because they incorporate the millions of the "no frills" Mzansi accounts that the banks issued customers since the early 1990s. The Mzansi accounts now lay dormant in their millions and those that are active are predominantly used to access salaries by low-wage earners that are withdrawn in full on payday (Granston, 2018).

The holders of these accounts also do not enjoy the full benefits of transactional banking, because the township *spaza* shops, minibus taxis and informal traders that they use daily deal only in cash and do not accept cards for payments. Furthermore, Rajasekaran (2018) also argues that the "no frills" Mzansi accounts fall short of financial inclusion criteria because of their lack of facilities such as access to credit which is vital to financial growth.

Financial inclusion in South Africa is recognised as one of the cornerstones of inclusive economic growth and is seen as a bridge to the attainment of social equality. The state has legislated other reform measures to attain financial inclusion and empower excluded groupings economically, such as seniors (FinMark, 2014).

However, evidence is not visibly available in relation to which aspects of financial inclusion provides assurances of economically empowering financially excluded persons (Dupas et al. 2018). Consequently, this results in misguided assumptions that merely providing the excluded access to a banking account, or a platform such as e-banking, equates to their financial inclusion and economic empowerment, disregarding whether there is any benefit derived therein.

Table 3.2: Unbanked statistics: Source, World Bank, Findex, 2012)

Unbanked Statistic	Regional Differences & factors
¾ of the world’s poor do not have a bank account not only because of poverty, but also due to costs, travel distance and paper work involved.	East Asia and Pacific (28% of population would have saved at a formal banking institution (equalling only 10% of the rest of the developing world), Latin America and Caribbean (19% = 10% of the rest of the developing world) and sub-Saharan Africa (16% = 3% of the rest of the developing world), Europe and Central Asia (61% = 32% rest of the developing world), North Africa (17% = 10% of Rest of developing world).
59% of adults in developing economies (such as South Africa) do not have a bank account for the above reasons.	1/3 of people in developing world cite distance travelling to a bank as the reason for not having a bank account.
77% of adults earning less than \$2 a day (+-R28) are unbanked.	Globally 1 over 3 of adults not having a bank account cite costs of opening and maintaining a bank account for not having one.
11% of adults in high-income economies are unbanked.	2/3 of adults without a bank account cite lack of money as the obstacle.

Principles of financial inclusion include access, affordability, appropriateness, usage, quality, consumer financial education, innovation and diversification, and simplicity of financial services and products (Banking Association of South Africa, 2014). The unbanked senior customers are ostensibly financially excluded by factors such as the inappropriateness of some of the services, the physical inaccessibility of the banks and low and unstable sources of income.

The World Bank (2014) found that other barriers of financial inclusion are costs, travel distance and documentation required. The travel distance factor however significantly relates to participation in financial service utilising the traditional physical branch.

Sakergayen (2018) argues that despite tremendous growth in terms of profitability and complexity, banks globally have not proactively devised means to bring the under-privileged into the financial markets. Christopher (2015) observes the following factors as having effect on financial inclusion:

- Low income relative to the costs of the services
- Low education with regards to banking and finance

- Lack of history
- Narrow products range
- Poor products' design

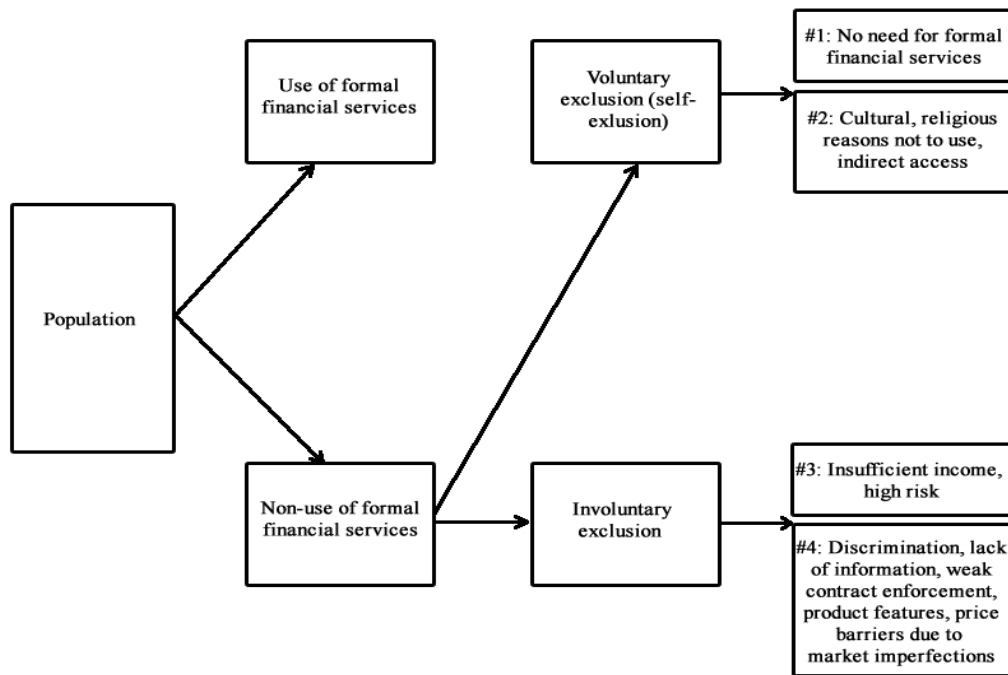


Figure 3.7: Financial inclusion and factors (Source: World Bank, 2014).

Other literature contends that poverty is the main factor attributable to the financial exclusion of persons such as digitally unbanked seniors. Dupas et al. (2018) conducted an experimental study over five years to examine the effects of removing the accounts opening requirements for basic savings accounts in three developing countries. The study (Dupas et al. 2018) found that what primarily prevented people from opening bank accounts and using them consistently was poverty (simply not having sufficient income to save). Therefore, the findings hold a promise for universal banking in countries such as South Africa where digitally unbanked seniors and other poor people derive consistent income from social security disbursements.

While highly secure, e-banking innovations are cheap to the users and they can become a tool for banking unbanked seniors (Etim, 2014). Oluwatayo (2013) conducted a study focused on banking the unbanked farmers in rural Nigeria. The study's research sample (Oluwatayo, 2013) was not specifically senior unbanked customers, but the findings demonstrated that m-banking was crucial in facilitating the financial inclusion of persons who were 55 years and older.

According to the findings of the study of Mago and Chitokwinda (2014) that focused on rural farming communities in Zimbabwe, unbanked seniors are willing to use e-banking provided it was cheap, convenient, accessible, easy-to-use and secure. Orotin, Quisenbery and Sun's (2014) study in Uganda found that the money transfer function of mobile money facilitated the financial inclusion of the unbanked. Gwalani and Parkhi (2014) studied determinants of financial exclusion in India and concludes by discussing various bridging models, including e-banking.

Some developed countries have successfully used e-banking subsets such as m-banking to bank the unbanked and under-banked. For example, the Federal Reserve (2015) found that 90% of the under-banked in the US have access to a cell phones, 73% of which are smart phones, and 48% of these people had used a mobile banking platform in the 12 months prior to the survey.

The costs of e-banking are intrinsically linked to its adoption by digitally unbanked seniors because customers naturally respond to price incentives. According to Gopal and Murale (2018), while seniors understand the relevance of these new technologies they lack the purchasing power to use them enthusiastically when compared to the younger customer segment.

For seniors, the costs of new technologies include the implications of the direct and indirect costs of learning how to use new technologies. Therefore, for as long as the alternative of the physical bank branch is available, seniors will have the inherent disincentive to acquire e-banking. Reddy and Reddy (2015) also established that the fees and charges of e-banking in general affect customers' satisfaction with these services as well as their willingness to use them.

Awareness of the benefits of e-banking services is one of the noticeable challenges of maximum usage. Lack of knowledge disempowers intended beneficiaries from acting, propositioning the need for robust awareness and empowerment programmes on the part of banks. In general, the lack of awareness of banking products and services ranks among the many factors that impact use. Dupas et al. (2018) found qualitative evidence in Chile that people were not familiar with the bank account opening processes despite there being "no frills" accounts that could be opened freely and implied no maintenance costs to the users.

iVeri (2014) argues that the problem with the m-banking sub-set of e-banking services in relation to financial inclusion is that they are limited merely to being reliable conduits of money from one end, only for that money to be withdrawn on the other, therefore not offering customers much participation in financial markets. Consequently, there is very little substance in the vouched financial inclusion that these services offer the unbanked, such as seniors.

While e-banking can be noted as the answer to banking unbanked seniors, the issue of how the e-banking products are developed and their subsequent designs remains paramount to adoption and use. The manner in which e-banking development is undertaken, and the poor quality of the product designs, has been cited as impacting adoption (Ezzi, 2014).

E-banking design must be usable as well as meet customers' needs and overcome behavioural problems (World Bank, 2014). The e-banking system also has to be developed to be aligned to what senior people need, and are familiar with, from their values perspective. Goumopoulos, Papa and Stavianos (2017) argue that aligning and tailor-making ICT's to the intended elderly users is a prerequisite of adoption and continued usage.

The findings of Iancu and Iancu (2017) demonstrate that compatibility of technology with senior citizens had a stronger influence to their intention to use it compared to other factors. Accordingly (Iancu & Iancu, 2017), compatibility is the degree at which any improvement can stick with the existing set of values and needs of the seniors, thus improving their quality of life. Therefore, given the centrality of the usability of the system to compatibility, it is important to include users in the entirety of the development lifecycle of e-banking systems (Isaias & Issa, 2015).

The e-banking user interface is important to design as its elements include user-friendliness, interface quality and human factors. Omotayo and Adebayo (2015) recommend that the banks should design e-banking platforms in such a manner that they are user friendly. In his study, Ezzi (2014) focused on the banks in Nigeria concludes that the e-banking design has to be contemporary, innovative and customer-centric. Therefore, the ensuring that the system suit the end-user is an important design factors in the SDLC as this is a customer-focus measure.

Alwan and Al-Zu'bi (2016) found that website design quality affects e-banking usage positively, as is the construction of trust assurance arguments. Masouda and Taqa (2017) found that the information content of the e-banking interface is very important to design. The findings of Maitlo, Kazi, Khaskhelgy and Shaikh (2014) indicate that website content should be of high quality. According to Goudarzi et al. (2013), the e-banking design features are important to establishing trust in e-banking and just as important to adoption.

The e-banking designs should also minimise risks for customers (Shaikh & Karjaluo, 2015). The risk of crime is a common deterrent to the adoption ICT's in general, especially given the extent to which seniors are a vulnerable group when it comes to financial crimes (Lach & Han, 2015). Goumopoulos et al. (2017) maintain that, in the case of ICT's designed for senior consumers, end-user involvement, as well as support, is critical in the design phases as that will achieve user adoption.

3.8 CUSTOMERS BUSINESS DESIGN INVOLVEMENT

Customer co-design has become prominent as part of the business innovation process (Vettelri et al. 2016). The notion of involving customers in business processes is considered variously in existing literature from many disciplines. In marketing literature, customer's involvement in the firm's processes is considered from a customer-centric perspective.

In banking, a customer-centric approach relates to the banks meeting both the tangible and intangible needs of their customers (Andaleeb, Rashid & Rahman, 2016). In information systems, end-users' involvement in systems design and co-design, refers to a collaborative effort between users and the system originator in the design of the system in order to meet the users' needs (Pirinen, 2016).

Taking advantage of technology and other available opportunities to advance customers' involvement can become a strong measure for the banks to build beneficial relationships. The establishment of relationships with customers is the most relevant option for differentiation (Addai et al. 2015).

However, Bapat (2014) observes that the banks' approach to innovations, such as e-banking, neglects customers' views. Banks only start engaging their customers once a finished solution has been developed (Vettelri et al. 2016). Whereas a truly customer-focused framework should be built on the organisation's overall architecture that incorporates the needs and wants of customers in key areas, such as products and services development (Mukerjee, 2013). This reflects the service-dominant logic from a goods-dominant culture by continuing to offer customers the services they demand, while in constant interaction with them, thereby creating customer value.

A customer-focused approach demands that all the organisational activities seek to learn more about new and latent customers' preferences by observing their behaviour and linking that to the organisation's value proposition (Vettelri et al. 2016). Many banks have not as yet developed frameworks for customer value and customer experience as key performance indicators (Bonacchi & Perego, 2011). When introducing services such as e-banking to customer segments such as the digitally unbanked seniors, the banks appear not to integrate customer-centric principles, which would otherwise convince these customers to use them, nor are these customers involved in the design process.

The adoption of an approach that focuses on customers when introducing services such as e-banking to digitally unbanked seniors presents the banks with the opportunity to integrate product design, marketing and other product and services activities around the customer (Bapat, 2014). To effectively adopt an approach that involves customers, banks must develop systems to enable them to detect the shifting trends in individual customer needs, which can be achieved through partnering with customers. Various types of customer involvement activities, especially in services sector have yielded positive results for firms according to literature by Fernandes and Remelhe (2016), He and Yan (2013) and Basil and Weistroffer (2011).

Pirinen (2016) argues that co-design processes involving customers reflects a shift from products to broader human goals and propagates the ability of the design process to solve human problems. It is through methods such as Design Thinking that organisations such as banks can derive customer focused approaches and enjoy the rewards of partnering customers, such as unbanked seniors in the development and introduction of e-banking (Vettelri et al. 2016).

3.8.1 The Design Thinking Approach: Customer's Co-creation

Traditional business products and systems introduction approaches can best be described as being based on assumptions of customers. The best articulated assumption about customers is often formulated, and then feedback from customers is generally deduced from the levels of adoption of a product or the scale of service usage by the customers (Siedel & Sebastian, 2013). These less efficient practices are progressively being replaced with uncostly tactical approaches to products and services introduction such as Design Thinking (Mathews & Wrigley, 2017).

Design Thinking is defined as a customer focused approach for integrating end customers to the innovation process (Vettelri et al. 2016:37). It is also considered to be an inclusive and effective way of providing processes and tools for innovative problem solving. Many large organisation use the Design Thinking perspective as a general problem-solving tool. Design Thinking is further considered a human-centred approach to develop and introduce technology that meets users' needs (Gruber, de Lone, George & Thompson, 2015). Reilley (2011) notes that Design Thinking took root in the field of consumer products development and the success of this human-centric approach caught the attention of the services sector with regards to, processes, strategy and business models. Therefore, various fields have found the Design Thinking approach effective.

Managers and practitioners in various fields are tapping into the problem solving approach of Design Thinking to resolve management challenges (Klinsmann, Valkenburg & Sluiis, 2017). Lee and Benza (2015) observe that in fields, such as higher education, Design Thinking has been found to be a useful innovation tool. Gruber et al. (2015) are of the opinion that firms, such as Apple and Samsung have long taken advantage of the Design Thinking approach to lead innovation in their fields by developing compelling products that meet their customers' needs.

Bennet, Cassim and van der Merwe (2017) developed a model of how Design Thinking can be used to impact societal change. Their study, which was based in South Africa, incorporated activity theory, generative theory, generative research, flow, and generative justice to address health problems through social design. Design Thinking is also considered a customer-centric approach that is useful in introducing new products and services to customers.

The Design Thinking approach can be considered either a problem-solving approach, or a research method that involves five key stages: *Understanding, Observation, Conceptualisation, Validation and Implementation* (Lee & Benza, 2015).

While the key stages of Design Thinking can be laid in a line and followed sequentially, the approach is not necessarily linear since a practitioner can revert back to the “conceptualisation” stage as a result of the feedback of the “validation” stage (Reilly, 2011). In addition, various labels of the Design Thinking steps are used, as is the expansion of the number of this approaches’ key steps, but the principles of collaboration and innovative problem-solving remains the same.



Figure 3.8: Design thinking steps (Source: Reilly, 2011).

In their explanation of how Deutsche Bank developed a novel customer-centric approach, Vettelri et al. (2016) argue that approaches, such as Design Thinking, which involve customers in co-creation from inception in the design of services systems throughout the value chain until implementation are some of the best ways for banks to achieve customer centricity.

According to Gruber et al. (2015), a system designer approaches a challenge with a detailed observation of the system users and the system’s context constraints (discovery phase), and this may involve ethnography, visual anthropology and the use of design probes. This essentially occurs before the “define” phase where the design challenge is categorised, which happens prior to the ideation process. Co-creation workshops are an essential tool of customer’s involvement, whereby customers are roped in to co-create the ICT innovation intended for their use prior to the ideation phase (Gruber et al. 2015).

A more business-like approach is generally undertaken by banks when they introduce e-banking services to their customers, including the seniors target market. A market opportunity is identified, either based on business insights or global trends, which is followed by a plunge into the implementation phase depending on available technologies, regulatory requirements, the bank's own enabling environment and overall customer enabling environment.

Therefore, there is a strong bidirectional fit to the system suppliers, regulatory environment, the bank's own capabilities and customer's enablement (do customers have the tools, such as computers and mobile devices to use e-banking?) but inadequate attention is placed on establishing a bidirectional fit with individual customer clusters, such as seniors. However, the overall intention of the designer is to design a system that is of use to the intended users.

Consequently, the customers as users in a single cluster are expected to summarily adopt the system as designed in a similar manner. Most literature approaches on adoption of these systems, such as e-banking, generally never venture into identifying factors prior to the system design. Arguably, the assumption is that the system is suitable in the format it is introduced and factors have to be identified to explain its users' adoption patterns. In many cases, the users as the primary stakeholders of the system have not been adequately involved in its design or did not even play a role in its creation in the first place.

Pedell et al. (2016) developed a model of how to involve different types of stakeholders that include users of the technology in the design process. The model of involving the user in the creation of the system includes technology probes, associated fieldworks and conceptual goals, models and pictures, messages as well as interviews. Pedell et al.'s (2016) model is useful as an alternative in understanding the resistance of seniors' towards e-banking, as it tackles future adoption issues from the stage of the abstract world of ideas origins of the innovation, through to the implementation phase, irrespective of the chosen System Development Lifecycle (SDLC).

3.9 MODELS OF SDLC: INVOLVING CUSTOMERS

E-banking is an ICT system, because it involves computer hardware, software and users. Kapoor (2015) states that e-banking basically refers to systems that enable customers to access their accounts and general information on bank products and services through computers or intelligent mobile or wireless devices. The framework that is used to plan,

design and implement the system refers to the model of system development (Rastogi, 2015).

The main driver for the increased implementation of e-banking by banks is their direct response to the pressure of competition in their market segment (Awara & Anyadighibe, 2014). While banks are increasingly implementing e-banking to adapt to market changes, accessing more customers as well as defending their market shares by servicing their existing customers better is always their end game (Kashmari, Ahg and Navebyadzi, 2016). Therefore, their existing and future customers are ultimately the primary end-users of e-banking systems.

Achieving the strategic aims of introducing e-banking systems is challenging, because it involves an in-depth understanding of how to plan and implement these services (Metwally, Hatem & Flood, 2012). The challenges of implementing ICT's can drain financial resources and result in failures in implementation, or worse, rejection by users. Metwally et al. (2012) list the following as success factors in the implementation of ICT's irrespective of the SDLC approach undertaken: (i) interaction of the ICT with the organisation, (ii) user involvement and participation, (iii) resistance and sceptics, (iv) commitment, (v) planning, and (vi) risks. It is incumbent on organisations to utilise a development model that is suitable to the circumstances of the system they plan on introducing (Dhanamma & Yeddu, 2017).

Effah and Nartey (2016) are of the opinion that the process of planning and implementing e-banking is complex and is shaped by context of the internal environment, as well as local geographic factors. Scroggins (2014) argues that system development lifecycles are not only theoretical, but happen in real-life on a continuous basis in relation to different types of ICT's, therefore all the nuts and bolts of the chosen model are important to implementation success.

Typically, the lifecycle on an ICT development starts with the initiation phase and ends with the system's implementation phase. There are five phases of the conventional system lifecycle (Arora & Arora, 2016):

- (i) Investigation
- (ii) User requirements compilation
- (iii) Analysis
- (iv) Design

(v) Implementation and maintenance

However, irrespective of the model that is followed, the system design phase is of utmost importance, because it is in this phase where all the stakeholders are engaged with and assured that all their needs are adapted into the design, therefore the system conforming to its intended users (Scroggins, 2014).

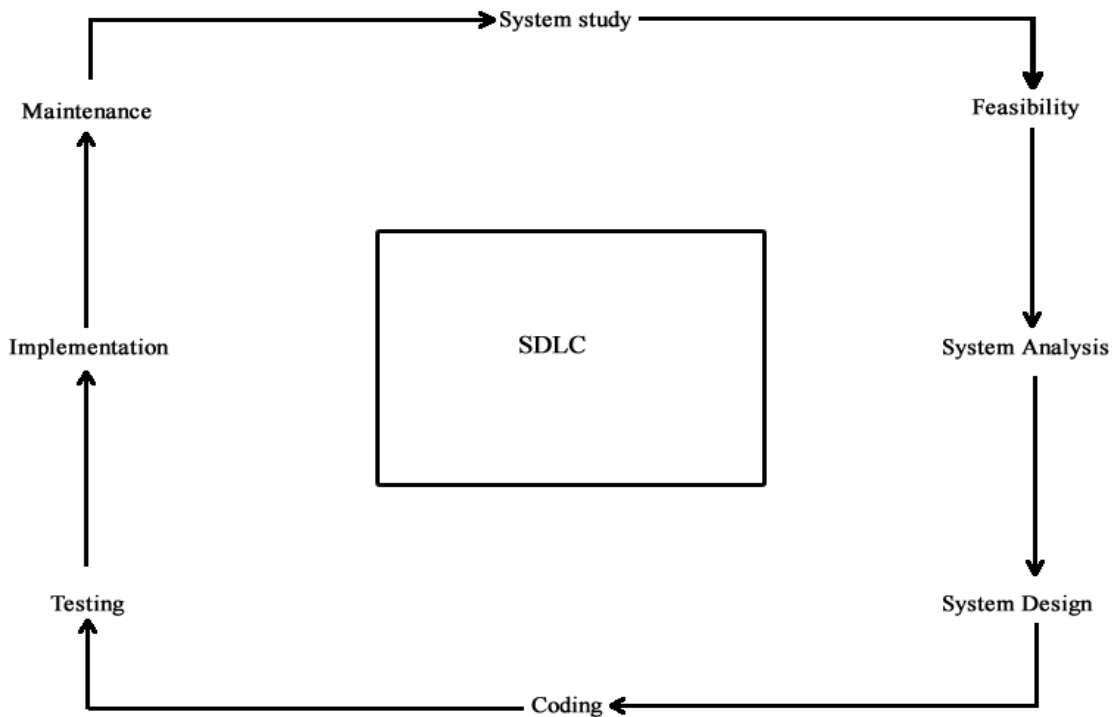


Figure 3.9: Phases of SDLC (Source: Mishra and Dubey, 2013).

It was found that e-banking systems are very complex and specific in nature, because they are built with a specific goal in mind. As Kaur (2015) observes, it is the reason the development process requires a guiding framework to configure and monitor the development along the various stages of the SDLC. Segmenting the development process into phases, with each phase having the commencement stage and ending, and a series of activities, is the most prominent feature of the framework (Isaias & Issa, 2015). Finding a way to report back to, and engage with stakeholders once their needs have been gathered and the design process has commenced is also important (Scroggins, 2014).

Typical primary stakeholders of a bank's e-banking system implementation would be the business unit responsible for the system, the commercial unit (for monetisation), internal

system's co-existence with the e-banking platform, internal users, as well as customers. However, most e-banking implementation assumes a business approach regardless of applying traditional SDLC models whereby the role of customers as the primary system's stakeholders is relegated (Kaur, 2015).

The most common SDLC's used in large ICT projects, such as e-banking, are the Waterfall model, the Incremental model, the Spiral and V-shaped models (Isaias & Issa, 2015). These models incorporate a form of user engagement in the system development lifecycle, the application of which is meant to assist in finding a bidirectional fit between the system and its users. This approach is squarely in line with the customer's co-creation notion proposed in the study.

3.9.1 The Waterfall Lifecycle Model

The Waterfall Lifecycle Model (Waterfall model) is the oldest SDLC approach that is used by many large firms and government entities (Arora & Arora, 2016). The Waterfall model has five phases: requirements, system and software design, implementation and testing, integration and system testing, and operation and maintenance (Isaias & Issa, 2015). The Waterfall model emphasises planning which results in system flaws being identified before they emerge at later stages of the SDLC.

The weakness of the Waterfall model is that it is a sequential model, meaning that every preceding stage happens sequentially prior to the next. This linearity is prohibitive, especially if there is a need to make changes in the system in the stages prior to the current stage. (Ebubeogu, 2015).

3.9.1.1 *Users' Involvement in Waterfall System Design*

In line with the Waterfall model, the fifth and last principle alongside the system development phases incorporates the involvement of the system users (Raisian, Yahava & Deraman, 2017). In other words, the involvement of the users in the development of the system only feature at the very end. Also, if there are any new requirements past the analysis phase, they cannot be factored in, because every phase is considered to be a static component.

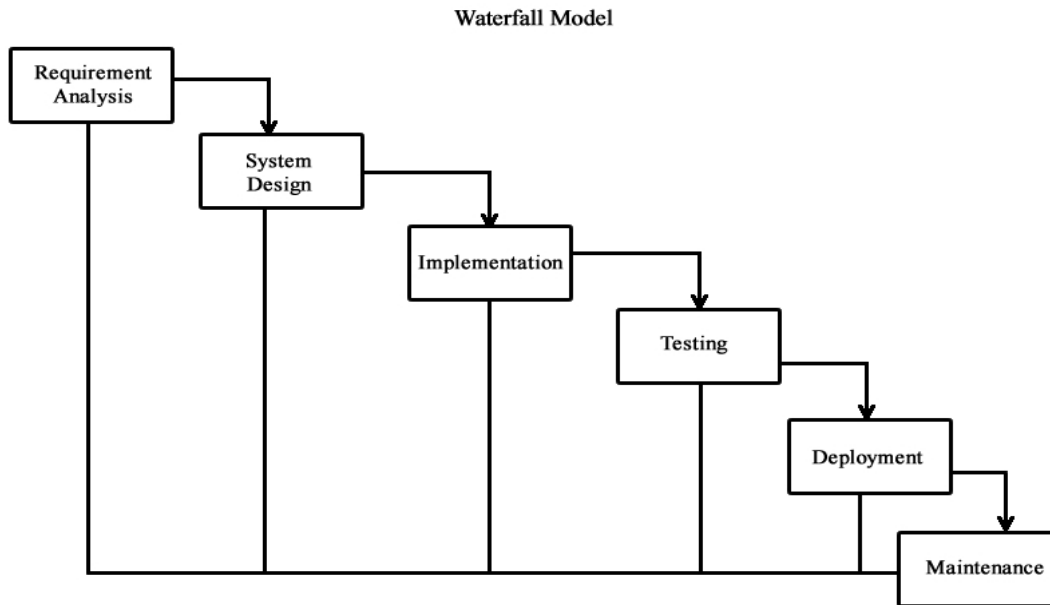


Figure 3.10: Waterfall model (Source: Arora and Arora, 2016).

According to Ebubeogu (2015), the advantage of the Waterfall model is that it is very easy to understand and use, and it has specific deliverables in each stage with no complexities or overlaps within the phases. However, if e-banking design was to be sequenced through this SDLC model as a standard then the challenge of finding solutions for the rejection of users, such as seniors, will persist as their needs would always feature *post facto*.

3.9.2 The Incremental Lifecycle Model

The Incremental Lifecycle model (Incremental model) proposes that instead of static phases of system lifecycle development, all phases can be implemented simultaneously in one fraction by means of incremental stages. Therefore, multiple developmental phases take place simultaneously and the developers of the system receive feedback at each fraction cycle (Raisian et al. 2017). With each feedback cycle, the product is improved and tested and the increments are added until the product is ready for consumers. Essentially, the Increment model propounds progressive development through gradual addition of new features until the system is complete and ready for use (Isaias & Issa, 2015). The downside of the Incremental model is that it can be costly and that the gradual

increments can pose compatibility issues with the existing systems they have to be added onto (Arora & Arora, 2016).

3.9.2.1 Users' Involvement in the Incremental Model

The benefit of the Incremental model is that users can be involved during the development phase of the system (Ebubougu, 2015). This empowers the end-users with influence on the end product as they are able to send the designers back to make changes that suit their requirements while the system is still under development.

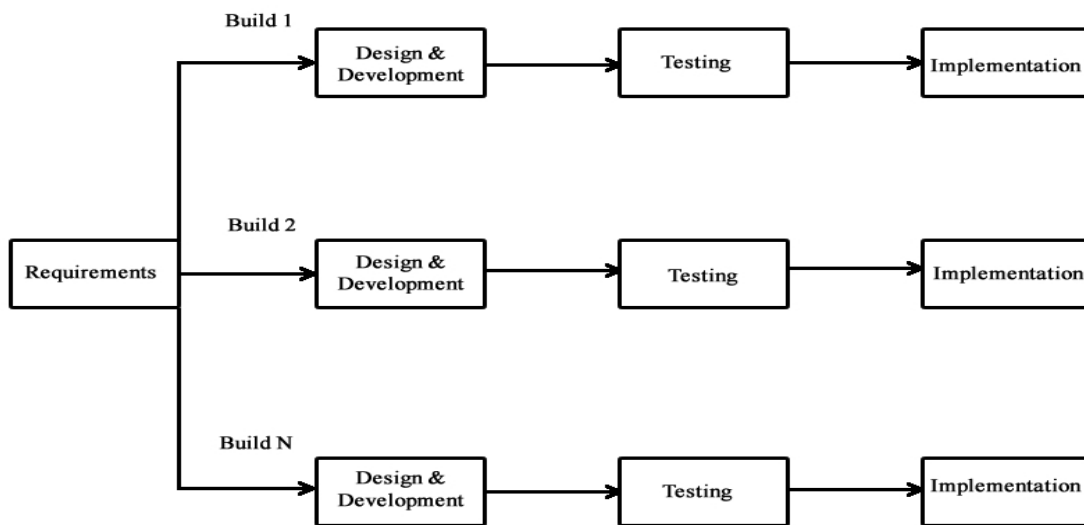


Figure 3.11: Incremental lifecycle model (Source: Isaias and Issa, 2015)

The core objective with the development or implementation of a system is its efficient integration into real-life circumstances (Isaias & Issa, 2015). With regards to e-banking systems, the banking industry's current concern is no longer the operability of the system internally, or its objectives as a communication and service channel for customers, but rather the system's adoption by their customers, such as seniors.

The Incremental model's amenability to the involvement of customers during the development phase is a potential cushion of its deficiency of high implementation costs given the banks' momentous challenge with adoption. The model can become a practical option for banks, because they can record the requirements of different types of customers.

3.9.3 The Spiral Lifecycle Model

The Spiral Lifecycle Model (Spiral model) incorporates positive traits of the other models and introduces risk as a factor. The model incorporates the idea of iterations with the stability of the fixed phases of the Waterfall model (Ebubougu, 2015). The phases in this model all begin by identifying objectives and requirements as well as constraints and alternatives analysis. The design phase comes thereafter, and it is followed by the build phase, which precedes the evaluation and risk assessment phase.

The model factors in the incremental phases of releasing the product, or refinement along the SDLC in each round. The focus on risk is the main advantage of the model, especially in large projects. Issa and Issa (2015) however states that the Spiral model's concentration on risk can become its weakness, especially in small projects as the costs of risks analysis can render these projects to become financially unviable.

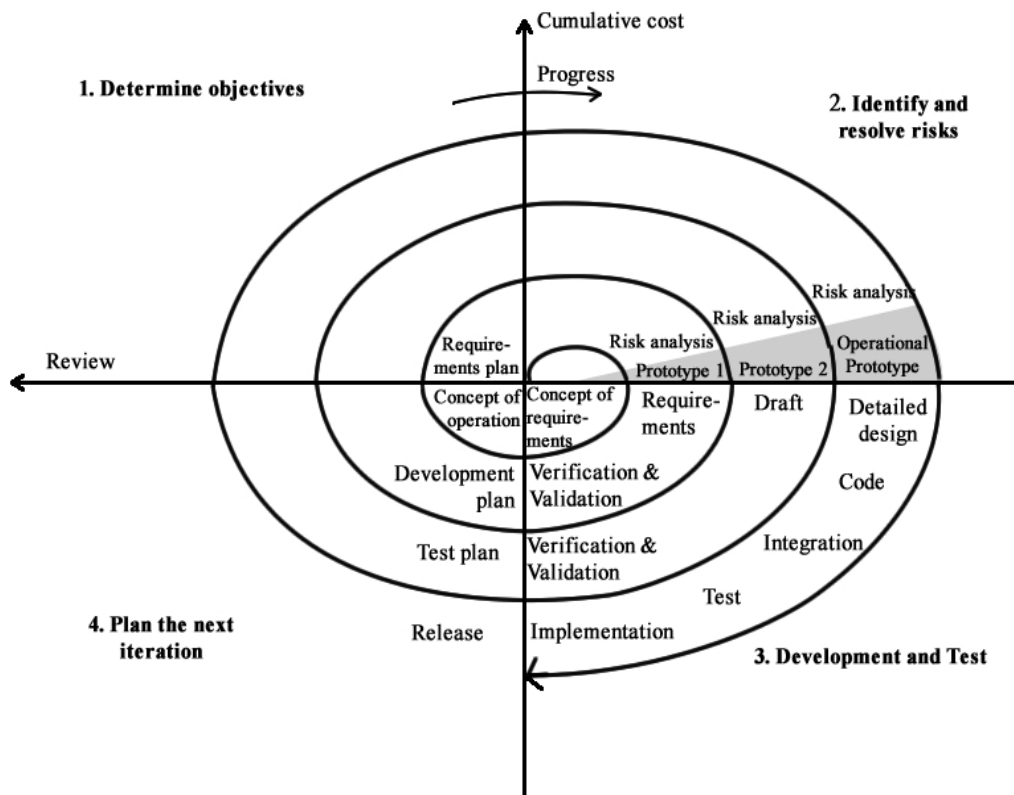


Figure 3.12: Spiral lifecycle model (Source: Isaias and Issa, 2015)

The objective of the SDLC models is to ensure that the development of systems, such as e-banking, are delivered timeously on schedule (Egwoh & Nenyelum, 2017). The

uncertainty of the time of delivery of the product with the Spiral model defeats this purpose and its usage may be counterproductive to the competitive needs of the banks.

3.9.3.1 *User's Involvement in the Spiral Model*

One of the benefits of the Spiral model is the extent to which compatibility is sought between the system and its various stakeholder environments, primarily its users. Gupta, Kumar and Bharadwai (2017) applied the spiral model phases to propose the deployment of a mobile banking platform for Bank ABC in India. Beyond user feedback on the system's bidirectional fit with their individual requirements, Gupta et al. (2017) recommends involving users in the design of the system, similar to adopting a co-creation method (as proposed in the current study) including conducting of workshops with users and the client commissioning the project.

3.9.4 The V-Shaped Lifecycle Model

The V-shaped Lifecycle Model (V-shaped model) is an enhancement of the Waterfall model (Isaias & Issa, 2015). Similar to the Waterfall model, the V-shaped model constitutes successive steps: an analysis of requirements, architectural and detailed design, and coding.

However, unlike the Waterfall model, parallel to these steps, there is an upward line that starts from coding and explains the detailed testing requirements for each stage of the model (Arora & Arora, 2016). Therefore, the V-Shape model accords the fixing of the development mistakes immediately after they have been identified through the development lifecycle, thereby eliminating costly mistakes. The weakness of the model, however, is its lack of flexibility through each stage of development.

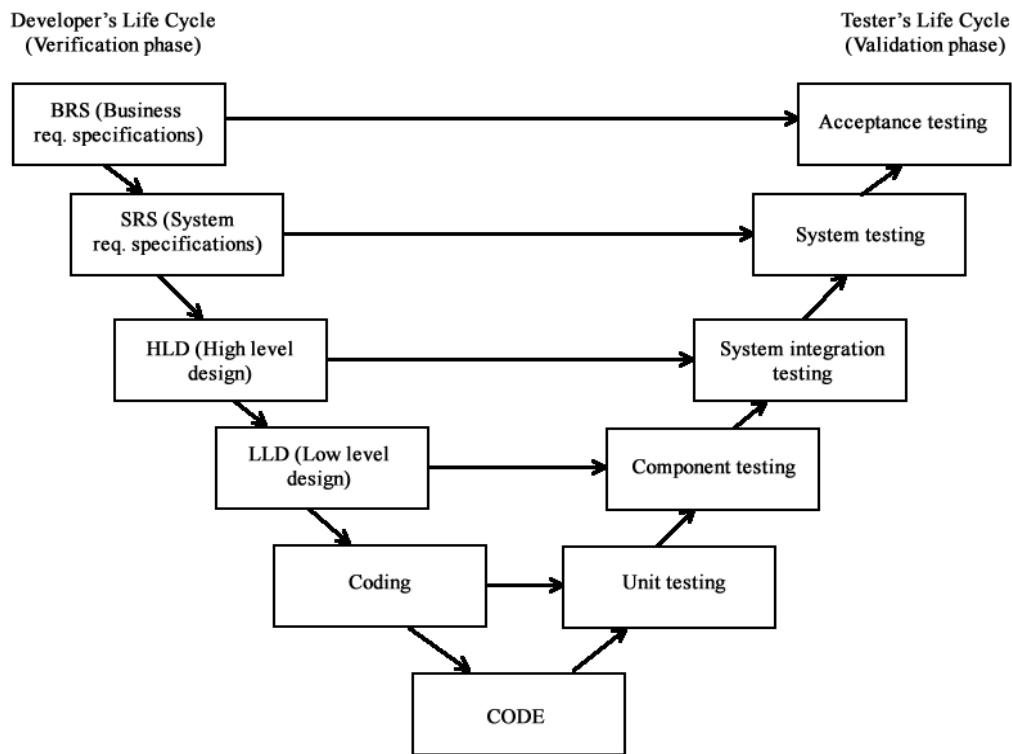


Figure 3.13: The V-shaped model (Source: Arora and Arora, 2016)

Arora and Arora (2016) list the following pros and cons of the V-model:

Pros:

- It is the same as the Waterfall model
- Tester role will be involved at the requirement phase itself
- Requirement changes are possible in any phase

Cons:

- It is very rigid and the least flexible of the SDLC models
- If any changes happen midway, not only the requirements documents, but also the test changes need to be changed
- It is not proposed for short projects as it requires reviews at each stage

3.9.4.1 Users' Involvement in the V-shaped model

The V-shaped model recognises users' involvement in the system's development in a much better format than the Waterfall model and it is much more flexible. In the case of banking projects, the rigidity and the reviews at each stage of the V-shaped model might hamper the turnaround of implementation, especially for a banking institution that has a

strategic vision to position itself as a market leader in innovation. Furthermore, e-banking infrastructure set-up costs are high (Franco & Bulomine, 2016). Consequently, banks as profit-focused firms would most likely prefer a systems development model that accords them shorter lead-times to recuperate their e-banking infrastructure set-up investments.

Customer involvement in co-creating products and services is noted in literature as a means of creating value. The various classic SDLC models acknowledge customer involvement in system development. However, traditional SDLC's do not necessarily emphasise collaboration in the form of co-creation between the firm and the users.

The outcome of collaborations between the supplier and the customer is a unique and focused customer solution and a reflection of customer-centricity (Vettelri et al. 2016). Consequent to the findings of Egwoh and Nenyelum (2017), it is recommended that banks should seek to stretch the bounds of whichever SDLC model they opt for in e-banking implementation to warrant more customer involvement in the creation of the output that will more attract usage by customers, such as the digitally unbanked seniors.

3.10 E-BANKING ADOPTION FACTORS

There is general resistance to e-banking, in particular among seniors (Camilleri & Grech, 2017). Meanwhile, it was found that the overall trajectory of banking globally is increasingly being digitized (PWC, 2018). In the existing literature, there are many factors that are listed as affecting the adoption of e-banking by customers. However, there appears no evidence in literature that the banks' processes of developing e-banking systems are more customers-driven, as opposed to expert system developers' driven. Therefore, a "top-down approach" that does not include customer involvement in the creation of e-banking is generally assumed by banks, and the developed digital banking platforms are expected to suit all customers.

Top-down design processes of technology create a mismatch between the technology and seniors (Wang et al. 2019). In general, seniors have special requirements, and when it comes to technology, their involvement in the system creation is recommended as the best means to get them to use it (Al-Shbiel & Ahmad, 2016; Olphert & Damodaran, 2013).

The final designs of e-banking platforms are generally standardised services packages that are specific to each bank and there is no evidence that some sort of customer clustering or segmentation, whereby customers can choose a certain e-banking platform that suits their preferences, is incorporated. One of the reasons seniors are less likely to adopt new technologies, such as e-banking, is that the designs generally do not cater for their cognitive challenges, such as the gradual loss of sight and dementia (Golant, 2017).

Factors, such as the perceived difficulty to use e-banking, cause digitally unbanked seniors not to have a positive attitude to these services. Other factors identified in the literature that influence seniors' attitude towards e-banking, include lack of trust, loss of physical contact with bank branch staff, and not having the equipment, such as computers, needed to perform e-banking transactions (Kumawat, 2014).

E-banking offer benefits to both banks and their customers (Jehangir et al. 2016). However, there are other findings that demonstrate that there is low levels of customers' awareness of e-banking despite the stated benefits of these services (M'Sallem & Mzoughi, 2014). In addition, banks do not appear to be creating awareness of these benefits among customers with the intention of attracting the unbanked, but instead the focus is on the already banked people.

Edwin et al. (2014) found that customer's awareness of the benefits of e-banking is an important factor affecting adoption. Kariyawasam and Jayasiri (2016) state that increasing users' awareness of e-banking is the missing component in the diffusion of the services. The study by Noreen (2015) found that customers could not even provide comments about e-banking, because of their lack of awareness, thus recommending that banks should invest in campaigns to publicise the benefits of these services to increase adoption.

Customers generally do not trust e-banking, which affects the levels of adoption of these services (Selvanathan, Tan, Bow & Spranamiam 2016). Trust is important to online transactions because of the uncertainty associated with the services where physical presence is absent. The lack of trust of e-banking among customers is also a noticeable deterrent of sustained usage of these services (Maduku, 2014). Supriaddin et al. (2015) argue that mistrust in the financial markets is not specific to e-banking but that the banking industry is inherently not trusted by customers.

The lack of trust regarding e-banking affects both potential new users, such as unbanked seniors, as well as existing customers (Nguyen & Huynh, 2016). A myriad of factors cause customer's mistrust of e-banking, which affects their attitude (Malaquias & Hwang, 2016). The study by Das and Dhar (2014) found that the attitude among most customers in India towards e-banking adoption was based on the lack of trust that they will not fall victim to various fraud scams. Liao, Huang and Hsies (2016) found that trust, more than privacy, explained customer's reluctance to adopt e-banking.

Alwan and Al-Zu'bi (2016) studied the factors impacting the adoption of e-banking in Jordan and a simple regression analysis determined that trust was an important factor. For a new service that intermediates people's financial transactions e-banking should be premised on trust. This is important because higher customer's trust can increase e-banking adoption (Nguyen & Huynh, 2016). Banks should develop strategies to build customer trust because that will provide assurance and improve adoption (Popoola & Arshad, 2015).

Customer's security concern is a factor identified that is related to trust. More attention is needed on the security of e-banking for customers to realize the many benefits of these services (Abu-Shanab & Matalqa, 2016). Customers need secure and safe environments when transacting with their money (Fadare, 2016). The prospect of loss of confidential information to third parties (Abdou, English & Adewunmi, 2014) and actual material financial loss due to fraud (Bhasin, 2016) affect adoption.

When customer's information is kept safe and secure, the adoption of e-banking will improve, because that is factor important to banking customers (Alwan & Al-Zu'bi, 2016). Given the open nature of e-banking platforms, such as the Internet, transaction security will remain a concern for potential users, such as unbanked seniors, as well as existing bank customers. Security includes protecting customers from the risk of fraud and financial loss (Abu-Shanab & Matalqa, 2016).

According to Mishra, Alwal, Elijah and Rabi (2017), financial security threats are among the major threats of e-banking that should be mitigated by increasing customers' awareness. Virk (2013) cites authentication to avoid spoofing, preventing eavesdropping to ensure privacy, data security to avoid data alterations and non-repudiation to avoid denial of previous acts.

In addition, banks incorporate encryptions and verifications to ensure privacy and security. Furthermore, secure authentication through the use of One-Time-Password (OTP) is also used through tokens in certain markets or via a cellular phone in others. However, Alsaiani, Papadaki, Dowland and Furnell (2014) argue that there is a need for alternative authentication mechanisms to the OTP.

Moreover, privacy is found to be particularly important for seniors (Wang et al. 2019). The fear of losing personal and financial information leads customers (such as unbanked seniors) to view e-banking as risky (Musaev & Yousoof, 2015). Customers do not trust the security of e-banking, which is the reason they find it risky to use these services. Belás et al. (2016) established that only 78% of their study's respondents in Slovakia had trust in the security of their bank. The findings of the study conducted by Mwiya et al. (2017) in Zambia demonstrates that improving customers' perceptions of security and safety of e-banking would increase the adoption of the service.

The lack of customers' familiarity with e-banking is an important factor impacting the adoption of these services (Amutha, 2016). Banks have implemented customer awareness initiatives to promote e-banking, however, the lack of familiarity is still prevalent, especially among digitally unbanked seniors. Customers are not aware of the benefits of e-banking, which hampers adoption (Kariyawasam & Jayasiri, 2016). For e-banking to be appealing to the unbanked senior customers, the service's value proposition must surpass that of traditional banking and banks need to devise better measures of creating awareness.

It is the prerogative of banks to take initiative in providing customers compelling arguments to accept e-banking (Edwin et al. 2014). Mavetera et al. (2014) cite a lack of awareness of the benefits of e-banking among the most important factors impacting adoption. According to Mwiya et al. (2017), when promoting e-banking benefits among customers, banks will essentially be punting the services' usefulness, which is a proven convincing factor in technology adoption.

The study by Ramavhona and Mokwena (2016) focuses on e-banking adoption in rural South Africa and the findings show that, while customers' willingness to use the services exist, the lack of awareness of e-banking benefits impact adoption negatively. Awareness through the mass media, exhibitions and other forms that give individualised attention to customers are recommended as they create facilitating conditions for e-banking adoption (Kariyawasam & Jayasiri, 2016).

In their Brazil-based study, Malaquiua and Hwang (2016) found that creating awareness in promoting the security of e-banking improved customers' trust of these services. Oliviera et al. (2014) also established that facilitating conditions, such as awareness, directly influences e-banking adoption. Customers want to know more about e-banking, which will help them use these services (Alraja, Salim, Uddin & Yousoof, 2016).

The creation of e-banking awareness to increase adoption is not limited only to the benefits of these services. It is necessary to empower customers to deal with cybercrime, for example, as that impacts on whether they view e-banking as risky or not.

The table 3.3 below presents all the literature on the e-banking factors identified in the study.

Table 3.3: E-banking adoption factors.

Factor	Studies
Customer Involvement/Co-creation	Addai et al. (2015); Gruber et al. (2015); Olphert and Damodaran, (2013); Gupta et al. (2017); Nili et al. (2014); Vettelri et al. (2016); Sheth et al. (2000); Pedell et al. (2016); Lee and Benza (2015); Reilly (2011); Pirinen (2016); Bonacchi and Perego (2011); Bapat (2014); Scroggins (2014); Dhanamma and Yeddu, (2017); Mishra and Bisht (2013); Baroudi et al. (1986)
Customer Awareness/Customer Empowerment & education	Alraja et al. (2016); Amutha, (2016); Edwin et al. (2014); Malaquias & Hwang (2016); Oliviera et al. (2014); Mavetera et al. (2014); Ramavhona and Mokwena (2016); Dupas et al. (2018); Kariyawasam and Jayasiri (2016)
PEOU & PU	Abdullah et al. (2017); Alkailani (2016); Chen et al. (2017); Davis (1986); Gao and Bai (2014); Maduku (2014); Mavetera et al. (2014); Rafique et al. (2014); Nagaraj and Singh (2017); Brar et al. (2014); Shaikh and Karjaluo (2015); Phuong and Vinh (2017); Yousofzai (2012); Rafique et al. (2014)
Design	Andaleeb (2016); Bianchi et al. (2017); Olphert and Damodaran (2013); Nili et al. (2014); Vettelri et al. (2016); Sheth et al. (2000); Franco and Bulomine (2016); Isaias and Issa (2015); Ebubeogu (2015); Kaur, 2015; Omotayo and Adebayo (2015); Goumopoulos et al. (2017); Ezzi (2014); World Bank (2014); Dhanamma and Yeddu (2017)
Trust	Nguyen and Huynh (2016); Supriaddin et al. (2015); Maduku (2014); Bhatt (2016); Gautam & Khare (2014); Gao and Bai (2014)
Privacy & Security	Abdou (2014); Alwan and Al-Zu'bi (2016); Belás et al. (2016); Bhasin (2016); Fadare, (2016); Musaev and Yousoof (2015); Alsaiani et al. (2014); Virk (2013)
Costs	Christopher (2015); Kumawat (2014); World Bank (2014); Reddy and Reddy (2015); Federal Reserve (2015); Reddy and Reddy (2015);
Attitude	Ajzen (2002); Alwan and Al-Zu'bi (2016); Balabanoff (2014); Das and Dhar (2014); Popoola and Arshad (2015); Liao et al. (2016); Malaquias & Hwang (2016); Kumawat (2014); Kasim et al. (2014); Moons and De Pelsmacker (2015)
Unbanked senior customers	Biggs (2017); CIA World Factbook (2017); Garg (2015); Kelly et al. (2015); World Bank (2014); World Health Organization (2015); Morris et al. (2013); Gautam & Khare (2014); Sonnet et al. (2014); Sakergayen (2018); Shaikh and Karjaluo (2015); Omotayo and Adebayo, 2015; Kasim et al. (2014)

3.11 CONCLUSION

There is a global call for the need to extend financial inclusion to all people, including digitally unbanked seniors (Louis & Chartier, 2017; World Bank, 2014; Federal Reserve, 2015). Financial inclusion does not only relate to people taking part in the financial marketplace, but it also relates to the suitability of the products and services that the banks design and introduce to the markets (Banking Association of South Africa, 2014). The digitally unbanked seniors are one such market segment.

Existing models of e-banking seem to be predominantly targeted towards the conversion of the already banked customers from using branches rather than the acquisition of the unbanked senior customers. This generates the need for broad customer-focused approaches that incorporate systems co-creation in the e-banking SDLC's to increase usage and convert the unbanked. When the banks develop broad customer-focused approaches, they will achieve customer value from acquisition, conversion, retention and overall lifetime value (Mukerjee, 2013).

One of the merits of e-banking is that it accords the banks room to offer their customers a lot of personalised services in accordance with their requirements (Bala, 2015). E-banking provides the banks the opportunity to utilize these services to attain the financial inclusion of the digitally unbanked customers by creating tailored e-based solutions derived from the seniors' involvement in the systems creation. Placing a focus on, and being responsive to, customer's individual differences and needs is by its nature customer-centricity. Andaleeb et al. (2016) describes a customer-centric approach as the means of creating products and services meeting customers tangible and intangible satisfaction criteria.

Baroudi et al.'s (1986) User Involvement and Information Satisfaction Theory proves that users' co-creation involvement in the creation of information systems increases its eventual use. This model also demonstrates that user's satisfaction with the system improves. The users' involvement in co-creating in Baroudi et al.'s (1986) model pertains to the involvement of users in all activities in the SDLC, including system definition, system design and system implementation. The present study's customer involvement construct is framed on this model.

In this chapter (Chapter 3), existing literature on the history of e-banking was presented. Literature texts on the challenges experienced globally, as well as in South Africa

principally, in relation to the notion of financial inclusion were presented. In particular, the chapter provided findings on the financial exclusion of seniors and the juxtaposing of this aspect with this population segment's unwillingness to adopt new banking ICT's. The chapter also presented literature on the role of ICT's in financial inclusion. It is widely acknowledged that the financial exclusion of marginalised groups, including the poor, certain racial groups and seniors, can be bridged via many forms of e-banking technologies.

Chapter 3 also presented literature review on the notion of customers' involvement in the design of ICT's in the SDLCs as a business' customer-centricity measure to enhance use. These studies found that e-banking technology use can be improved when customers are involved the design of the services.

The following chapter (Chapter 4) presents the research method that was applied in the study. In Chapter 4, the study's universe, philosophical posture, research design as well as the sampling strategy that was used for the purposes of the study, are discussed. The contents of the questionnaire that was used to collect the study's data, together with the data collection methods and techniques that were deployed are also presented. The study's population is also discussed. In addition, the data analysis method that was applied is presented and justified.

CHAPTER 4

RESEARCH METHOD

4.1 INTRODUCTION

Existing literature that is relevant to the study was presented and discussed in the previous chapter. The literature review included studies on e-banking and the banking industry's investment rationale in this ICT platform, together with factors that influence customer adoption. The existing literature that was reviewed and analysed also focused on seniors as a customer segment.

Specifically, the discussion focused on literature regarding the notion of the growing seniors' segment due to global ageing trends. Studies that envisaged the role of e-banking in the financial inclusion of digitally unbanked seniors were also discussed. Chapter 3 also presented a discussion of literature on the notion of involving customers in the co-creation of this system in the SDLC as a means of increasing adoption.

Chapter 4 presents the study's research design and research method, as well as the justification for the choice of the research method. The present study sought to develop an empirical framework on how banks can extend their e-banking services to bank digitally unbanked seniors. Therefore, the main focus of the thesis is an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking.

In the study ten factors derived from existing literature in relation to direct and indirect relationships with the willingness to use e-banking among digitally unbanked seniors were examined. The data collection method and sampling scheme deployed are also discussed in this chapter. Chapter 4 commences by defining the study's universe and philosophical background.

4.2 DEFINING THE UNIVERSE

The current research study's focus is on comprehensive financial inclusion in the banking marketplace in South Africa, specifically on the inclusion of digitally unbanked seniors (as defined above) in banking via e-banking. Therefore, the universe is defined as digitally unbanked seniors in South Africa.

The size of the universe is not explicitly determinable in the literature, or otherwise. However, FinMark (2014) demonstrates that 14% of the adult population in South Africa is unbanked (lacking a banking account) and many more have limited access to formal banking (and are unable to access e-banking services). The digitally unbanked senior population is a part of this population.

4.3 PHILOSOPHICAL POSTURE

Scientific research is the systematic process of inquisition aimed at discovering or interpreting facts that are rooted in a certain reality (Queirós, Faria & Almeida, 2017). According to Antwi and Hamza (2015:217), all research is based on some underlying philosophical assumption about what constitutes valid research. As a result, each philosophy has a set of underlying assumptions about diagnosing a research process and provides a route to be followed when implementing research (Antwi & Hamza, 2015).

The selection of the research methodology for a research venture depends on the paradigm that guides the research (Moon & Blackman, 2014). A research paradigm refers to the approach to thinking about doing research, therefore signifying a research culture common to a community of researchers about how to conduct research (Khaldi, 2017). However, the preference of many researchers is to consider research within two common research methods of qualitative and quantitative research without understanding the main dimensions of research (Antwi & Hamza, 2015).

Research has three main dimensions, which are ontology (what is knowable), epistemology (views on truth and legitimate knowledge) and methodology (how the enquirer finds out knowledge) (Khaldi, 2017). A research paradigm is our way of understanding the reality of the world and studying it, therefore a basic belief system and theoretical framework with assumptions about ontology, epistemology, methodology and methods (Rehman & Elharthi, 2016).

A research paradigm is the researcher's worldview or the conceptual lens through which they examine the methodological aspects of the research project to determine the research method and the way data will be analysed in the process (Kivunja & Kuyini, 2017). Therefore, the framework that guides the research process, including the strategies deployed, the methods and analysis resides in the researcher's worldview.

Ontology has two contrasting positions: objectivism and positivism. A positivist paradigm maintains the belief that reality is out there to be studied, captured and understood (Kivunja & Kuyini, 2017). Constructionism's stance is of relativism, in that reality differs from person to person.

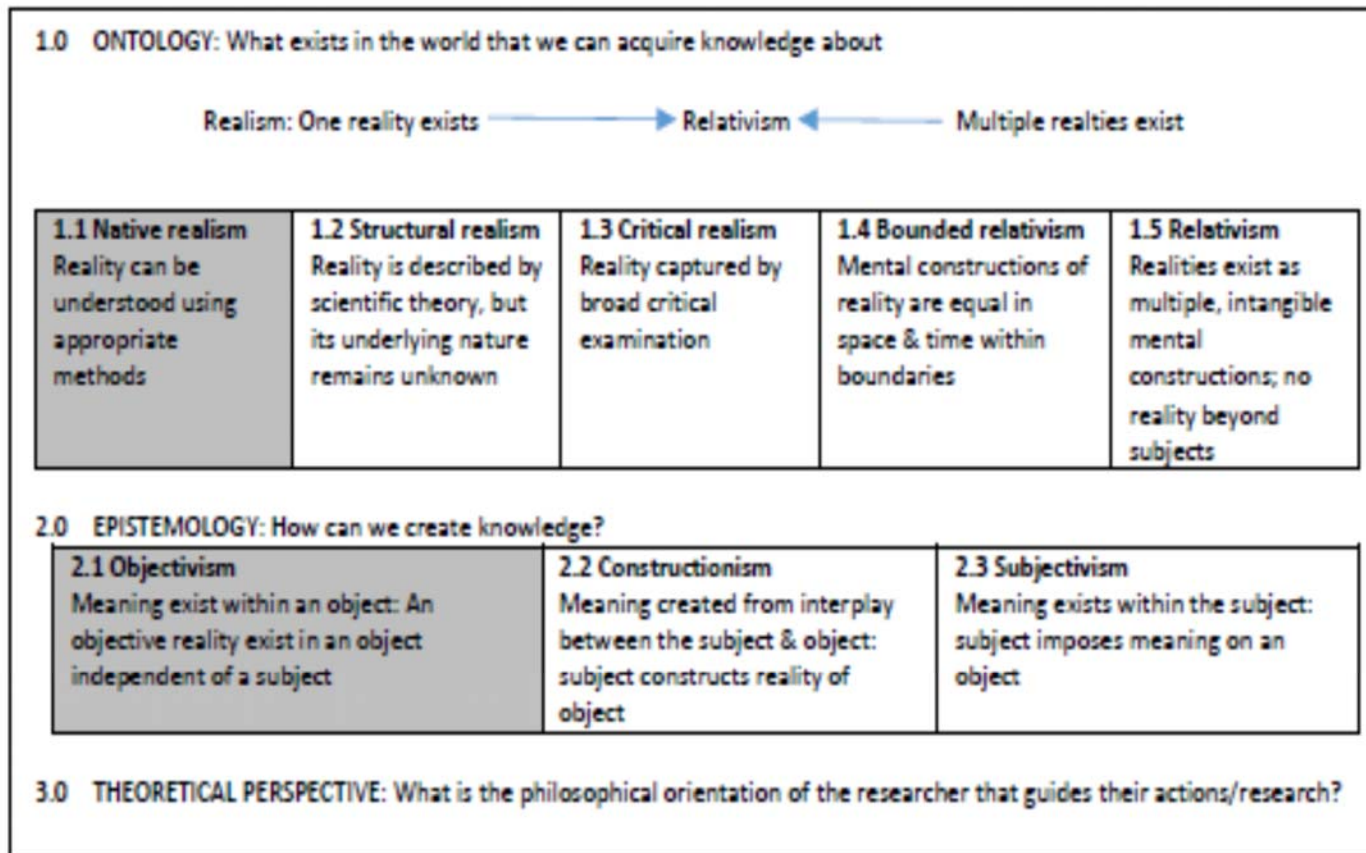
A positivist researcher takes an objective stance in the study (ontologically) and is detached epistemologically believing that people's statements and perceptions are either true or false (Khaldi, 2017). According to Antwi and Hamza (2015), epistemologically, a positivist sees social science as an organised method for combining deductive logic with precise empirical observations of individual behaviour in order to discover and confirm a set of probabilistic and causal laws that can be used to predict general patterns of human activity.

Methodology, on the other hand, is a strategy of how to conduct research based on ontological and epistemological principles (Rehman & Elharthie, 2016). Methodology is concerned with the "why", "what", "from where", "when and how" data is collected and analysed. Therefore, methodology is simply the science of finding out. Methods are specific techniques for collecting and analysing data.

The positivist paradigm underpins quantitative research, where the researcher maintains a detached stance and it is concerned with measuring variables and testing hypotheses that are linked to general causal explanations (Antwi & Hamza, 2015).

Rahman (2017) argues that the polarisation, and even competitive practices, of packing research neatly into distinct and mutually exclusive categories is counter-productive and negates methodological pluralism in research, whereas what is indeed exclusive is the philosophical perspectives. Irene (2014) states that the pragmatic purists' dogma should be rejected in favour of advancements for a hybrid model of undertaking research, because any quantitative approaches are underpinned by qualitative considerations and vice versa. Research philosophy addresses the assumptions that are made to support the research strategy and methods that are chosen as part of the paradigm. Therefore, the knowledge of the chosen research philosophy will help the researcher recognise which research designs will work for their study. The present study assumed a positivist philosophy. The shaded sections of Table 4.1 present this philosophy's ontology, epistemology and theoretical perspective.

Table 4.1: Research paradigms (Adapted from Moon and Blackman, 2014).



4.4 RESEARCH DESIGN

The objective of social science is to observe, verify and make conclusions on a phenomenon in a social context (Rahman, 2017). A research design is the specific method a researcher uses to collect, analyse and interpret data (Wright et al. 2016). The purpose of a research design in social science is to ensure that suitable methods are applied in research. Research design is the technique of investigation adopted by the researcher to find facts (Senam & Akpan, 2014). Therefore, the function of the research design is to form a blueprint of the research study to ensure that a research question is answered logically and as unambiguously as possible (Etikan, Musa & Ailemen, 2016).

The investigation of digitally unbanked senior customers' e-banking adoption is a complex process that can be approached in different ways (Gao & Bai, 2014). However, it is important to give most attention to the belief formation of senior customers, while also attempting to jointly understand their individual needs and wants and their personal, social, psychological influences, as well as resources and utilitarian factors (Effah & Nartey, 2016).

Contextual factors are important when it comes to understanding systems adoption and increasing usage (Gao & Bai, 2014). Therefore, to increase digitally unbanked seniors' use of e-banking requires the understanding of factors that are beyond the physical use of the system by considering other possible factors.

SEM with latent variables was applied in this study. Therefore, the measurement model was first estimated and then correlations, or covariance matrix, between variables served as an input to estimate the structural coefficients between constructs and latent variables.

SEM was deemed suitable because, based on the research question and the literature review, the study sought to establish a modelled empirical framework on how banks in South Africa can include digitally unbanked senior customers into the financial marketplace through e-banking. In this way, the study sought to establish the statistical relationship between latent (unobserved) and observed variables.

The current study's conceptual modelled empirical framework was defined based on existing literature that was reviewed, as well as e-banking theories wherein the proposed relationships between constructs are presented. SEM was also deemed suitable in the present study, because it allows for the testing of theoretical propositions in non-experimental data. SEM is also useful when it comes to theoretically testing relationships between constructs (Civelek, 2018).

4.3.1 Research Methodology

A research methodology is the strategy applied to conduct research, or the science of finding out. It is a way of systematically solving a research problem and the methodology to use in any research design (Senam & Akpan, 2014). Research methodology is important not only because it embodies philosophical assumptions, but also because it guides the selection of the research method (Long, 2014). According to Salvador (2016), research takes the form of a qualitative and quantitative research methodology in modelling and analysing different phenomenon.

A qualitative research methodology is inductive in nature and the researcher seeks subjectivity through in-depth collection of information and draws conclusions on the basis of their observation (Queirós et al. 2017).

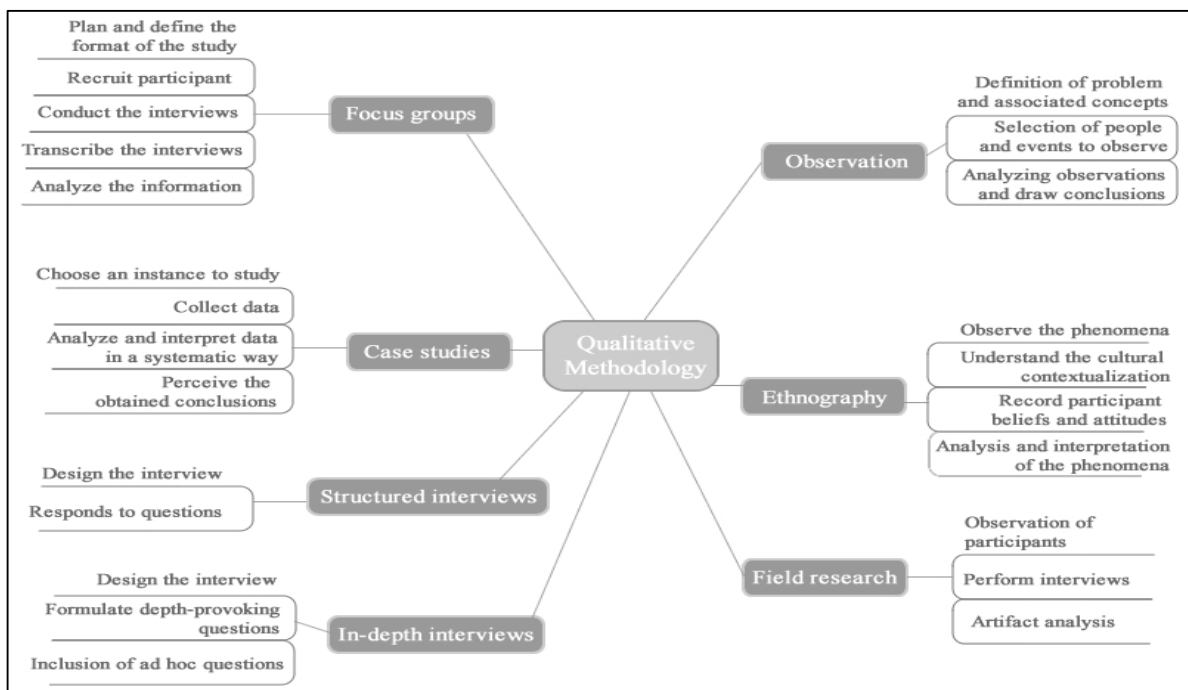


Figure 4.1: Qualitative research mind map (Queirós, Faria & Almeida, 2017)

Quantitative research focuses on fresh data collection in accordance with the problem from large populations and the analysis of data, but disregards the emotions and feelings of participants and environmental factors (Rahi, 2017).

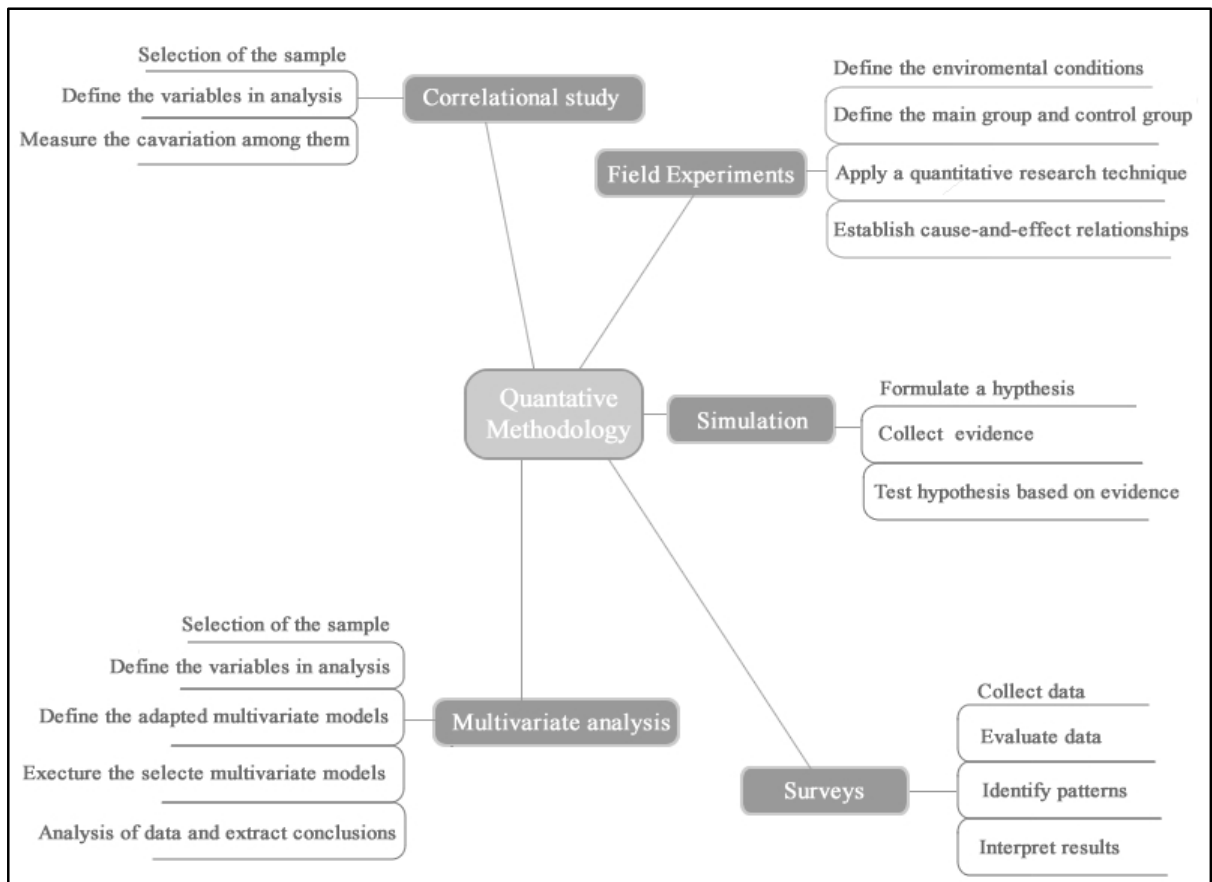


Figure 4.2: Quantitative research mind map (Queirós, Faria & Almeida, 2017)

The combined application of both quantitative and qualitative research without necessarily retaining walls of distinction is advocated in research (McKim, 2017). Other research from Fetters and Molina-Azorin (2017) go as far as calling this trend the development of a “new dawn of research”. Maxwell (2016) argues, however, that the combined use of the quantitative and qualitative methods without specifically labelling them as such predates social sciences, with this practice having been carried out in fields, such as astronomy by the likes of Galileo.

Table 4.2 presents the distinction between qualitative and quantitative research methods.

Table 4.2: Quantitative v Qualitative Research Methods

	Quantitative	Qualitative
Goal	Predict and explain	Understand
Knowledge sought	General, context independent	Specific, context dependent
Research	Step by step controlled experiment with statistical significance	Descriptive evolving design derived from the natural setting
Characteristics	Objective Nomethetic Quantitative Outsider Etic	Subjective Ideographic Qualitative Insider Emic
Criticism	Leave social context	Based on individuals experience and interpretations

4.3.1.1 Study's Research Methodology: Quantitative Research

The goal of the present study, as a result of the research problem, was to research how banks can use e-banking to include digitally unbanked seniors and by so doing contribute to resolving financial exclusion challenges. Therefore, the main focus of the study was an empirical analysis of problems experienced by unbanked seniors to conduct digital banking.

Profit persistence guided by market-related factors, such as large sustained consumption of services, informs the banks' investment decisions to target certain market sectors, such as digitally unbanked seniors (Pervan, Pelivan & Arneric, 2015). For that reason, to achieve its goals, the outcomes of the study should be generalisable and present a reliable reflection on digitally unbanked seniors as a market segment. Consequently, it was felt that quantitative research was the best suitable research methodology. The generalisability of results is a key characteristic of quantitative research (Salvador, 2016).

The study assumed a positivist philosophical posture and a natural scientist's approach was implemented. The quantitative research methodology, which finds its origins in the natural sciences, is concerned with social reality that can be observed and measured in some way (Antwi & Hamza, 2015). The social reality under observation and measured in the present study was the circumstances under which digitally unbanked seniors are willing to use e-banking.

In addition, quantitative research was deemed the suitable research methodology because, in its nature, it offers a research study some level of objectivity through testable hypothesis (Bonds-Raacke & Raccke, 2014). The present study's proposition derived from the literature review is that there is a correlation between a set of independent variables (including customer involvement, awareness, design, PEOU, trust, risk and security, attitude, PU) and the dependent variable (willingness to use).

Furthermore, testing theories or explanations is the methodological orientation of quantitative research (Salvador, 2016). The present study's aim was to contribute such an explanation in the form of an empirical framework on how digitally unbanked seniors can be banked. Quantitative research surveys are also an excellent method of studying behaviours, attitudes or opinions (Rahi, 2017) and this was found to be in sync with the aim of the study.

A survey questionnaire was designed as an instrument to measure the study's variables. Quantitative data was collected with a sample of digitally unbanked seniors. SEM was then used to analyse structural relationships and model specification.

4.3.2 Study's Latent Constructs and Hypotheses

The following were the present study's latent constructs based on the literature review:

- Customer involvement
- Bank initiative
- PEOU
- Design
- PU
- Security and risk
- Trust
- Costs
- Attitude
- Willingness to use

Consequent to the literature reviewed on models of e-banking adoption, a hypothesised conceptual model framework was developed for the study (Figure 4.3).

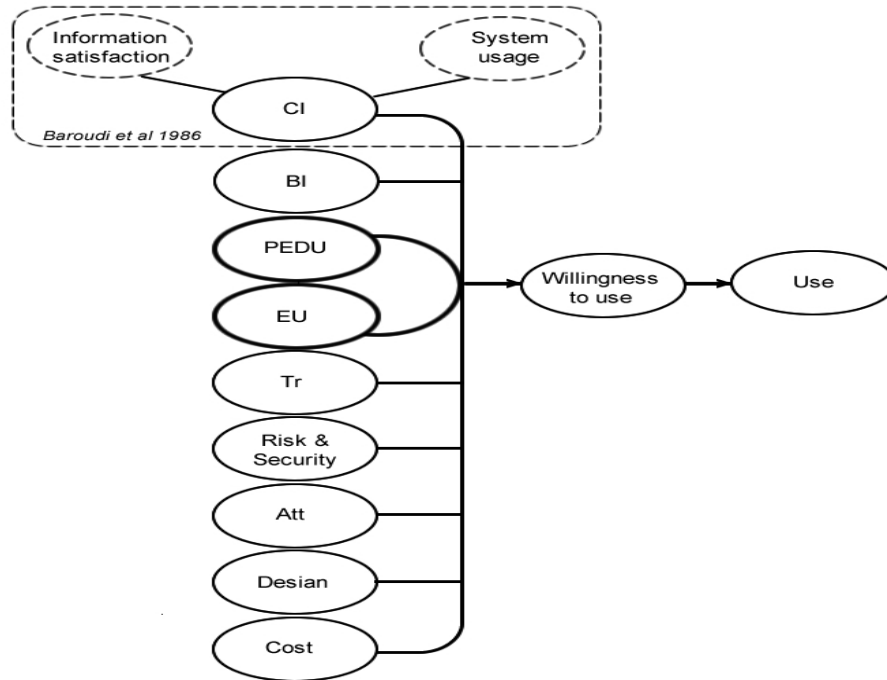


Figure 4.3: Present Study’s Conceptual Framework (depicting latent constructs)

Customer-centric approaches require all organisational activities to learn more about new and latent customers’ preferences by observing their behaviour and linking that to the organisation’s value proposition (Vettelri et al. 2016). The co-creation of services involving customers reflects this shift (Pirinen, 2016).

Customers’ co-creation of products and services is listed in various sources as a means of creating customer value, because co-creation allows for companies and customers to create value through interaction (Galvagno & Dalli, 2014). By involving customers in service creation, organisations can capture customer preferences and gain a competitive advantage (Ida, 2017). Various SDLC models acknowledge the importance of customer involvement in the development of the system.

The outcome of collaborations between a supplier and the customer is unique and focused services offerings. Based on findings in the literature (Ida, 2017; Nili, Tate, Johnston & Gable, 2014), this study propounds that digitally unbanked senior customers’ involvement in e-banking design will have a positive effect on their willingness to use these services (as seen in figure 4.4).

H#1: Digitally unbanked seniors' involvement in the system definition, system design and system implementation of e-banking will have a direct, positive effect on their willingness to use the services.

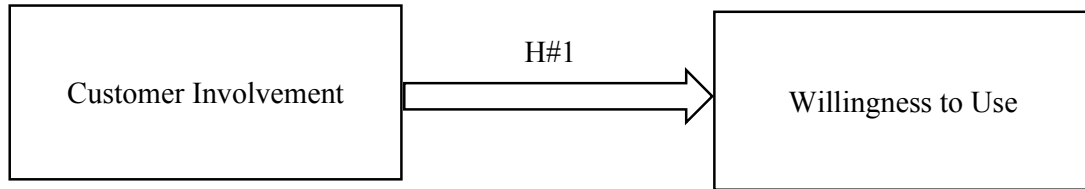


Figure 4.4: Customer involvement factor hypothesis

Customers' awareness of e-banking is important for the adoption of the system (Mavetera et al. 2014). Banks' initiatives in promoting e-banking benefits improve the adoption of the system (Malaquiuas & Hwang, 2016). Customers want to know more about e-banking and awareness will help them use these services (Alraja et al. 2016). Essentially, banks should make more information available about the benefits of e-banking in order to improve the adoption of these services (Jehan & Ansari, 2018).

Awareness programmes, including communication via the mass media improves adoption. Customers also need facilitating conditions that provide them support in order to adopt e-banking (Oliviera et al. 2014). Based on these findings, the present study states that the banks' initiatives in creating awareness of the benefits of e-banking among digitally unbanked senior customers and providing support to this segment will have a positive effect on their willingness to use these services (as seen in figure 4.5).

H#2: The banks' initiative in the creation of support and awareness of the benefits of e-banking among digitally unbanked senior customers will have a direct, positive effect on these customers' willingness to use these services.

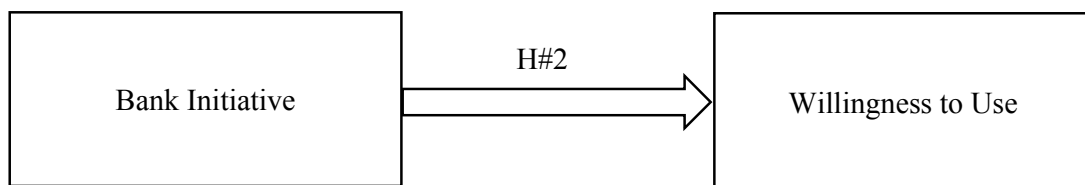


Figure 4.5: Bank initiative factor hypothesis

A system's compatibility with users is important when it comes to user adoption (Asami & Ishaya, 2012). Compatibility is the degree to which the design of the system can stick with the existing set of values and needs of the users. Given the centrality of the usability of the system, it is crucial to include users in the entire development lifecycle (Isaias & Issa, 2015).

Design aspects, including friendliness, interface quality and human factors, are important predetermining factors of adoption (Ojeniyi et al. 2015). The designs have to be customer-centric and suit the targeted customers (Ezzi, 2014). The quality of the design of the system's platform, as well as website content, affect adoption (Alwan & Al-Zu'bi, 2016; Maitlo et al. 2014).

The findings of a study by Fawzy and Esawai (2017) in Egypt indicate that the website characteristics, such as the quality of the displayed information had a direct effect on e-banking usage. Based on these literature findings, this study propounds that e-banking design that considers the compatibility needs and wants of digitally unbanked seniors, including their cognitive challenges, will have a direct positive effect on their willingness to use these services (as seen in figure 4.6).

H#3: e-banking services that are designed to suit digitally unbanked seniors, in terms of issues, such as their cognitive challenges, will have a positive, direct effect on these customers' willingness to use the services.

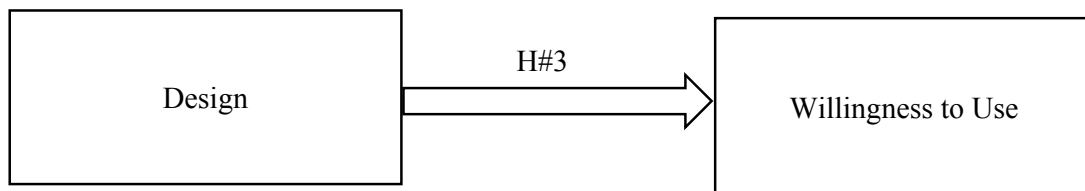


Figure 4.6: Design factor hypothesis

Davis (1986) defines perceived ease-of-use (PEOU) as the degree to which a person believes that the use of a system will be effortless. In addition, perceived usefulness (PU) is the degree to which a person believes that using the system would increase his or her performance. It was found that the TAM constructs of perceived ease-of-use and perceived usefulness are strong in predicting e-banking adoption (Nagaraj & Singh, 2017; Hajiyev, 2017).

Yadav (2016) identified PEOU and PU to be active drivers of e-banking adoption. Khurshid and Tasneem (2014) in their e-banking study focusing on customers in Pakistan found support to the predictive power of PEOU and EU on customers' attitude to use e-banking. The findings by Brar et al. (2014) confirm the predictive power of PEOU and PU on usage.

Shaikh and Karjaluo (2015) conducted a literature review on m-banking and established that most of the researchers in this area lean more on the usage of the TAM constructs. The study by Rafique et al. (2014) found that PEOU affects attitude towards customer-targeted electronic technology. Based on these findings, the present study propounds that PEOU and the PU of the e-banking system will have a direct positive effect on digitally unbanked senior's willingness to use these services (as seen in figure 4.7 and figure 4.8, respectively).

H#4: e-banking services that are perceived to be easy-to-use will have a direct, positive effect on digitally unbanked seniors' willingness to use the services.

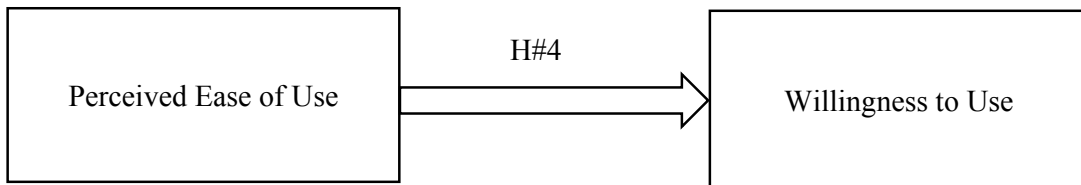


Figure 4.7: Perceived ease of use factor hypothesis

H#9: E-banking services that are seen as useful by digitally unbanked seniors will have a direct positive effect on their willingness to use these services.

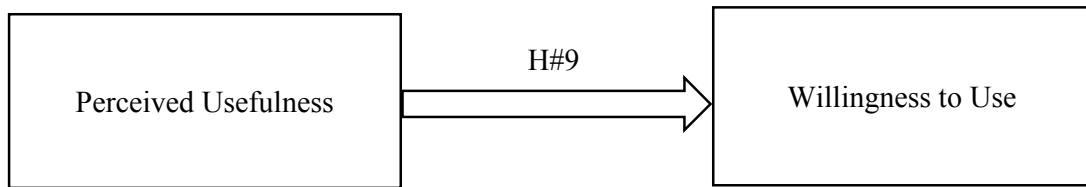


Figure 4.8: Perceived usefulness factor hypothesis

Customers do not trust e-banking (Maduku, 2014), meanwhile trust is important to online transactions, because of the uncertainty associated with banking services where physical presence is lacking. People also have an inherent distrust of banks (Supriaddin et al. 2015). Distrust of e-banking affects both existing and new users, such as unbanked seniors (Nguyen & Huynh, 2016).

Jehan and Ansari (2018) conducted a study to identify factors important to internet banking adoption in Saudi Arabia, as well as their relevance, and the findings demonstrated that trust was the most crucial factor. Higher customer's trust can increase e-banking adoption (Das & Dhar, 2014).

It is to the benefit of banks to develop strategies to improve customers' trust, because that will improve e-banking adoption (Popoola & Arshad, 2015). Based on these findings, this study propounds that trust will have a direct positive effect on digitally unbanked senior's willingness to use e-banking, and the actual use of the systems.

H#5: e-banking services that are seen to be trustworthy by digitally unbanked seniors will have a direct, positive effect on their willingness to use them.

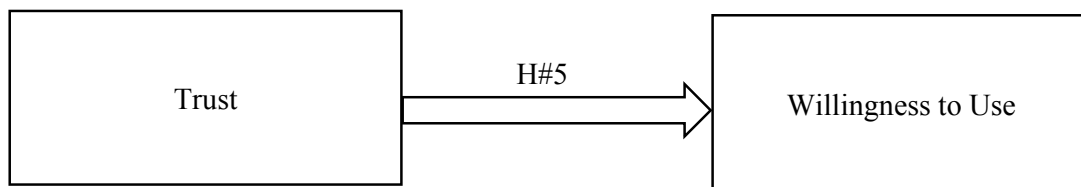


Figure 4.9: Trust factor hypothesis

Since e-banking platforms are web-based and the human interface that is synonymous with bank branch banking is removed, transaction security remains a user's concern (Mwiya et al. 2017). Customers get concerned with the time risk, financial risk and performance risk with regards to using e-banking services (Chavali & Kumar, 2018). Security includes protection from fraud-related financial loss (Virk, 2013) and privacy issues, such as loss of personal information (Musaev & Yousoof, 2015). Chavali and Kumar (2018) in their study focusing on customers in the United Arab Emirates found that the lack of privacy in internet banking was the major factor that negatively affected adoption. Other research by Belás et al. (2016) found that privacy, together with its close association with trust, has the biggest effect on the adoption of e-banking.

Fawzy and Esawai (2017) determined that to improve the adoption of e-banking, banks must deal with customers' perceived risk of using the services, which are associated with the lack of privacy and security of these services. Seniors are particularly not confident to use new technology (Kelly et al. 2015). Consequent to these findings, the present study submits that when senior unbanked customers have security and trust concerns about e-banking, it would have a direct negative effect on their willingness to use these services. (as seen in figure 4.10).

H#6: e-banking services that are not private and secure will have a direct, negative effect on digitally unbanked senior's willingness to use these services.

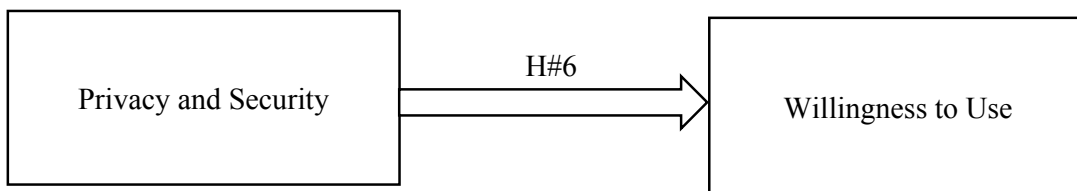


Figure 4.10: Privacy and security factor hypothesis

The main drivers of financial exclusion include low income and unemployment (Choudhury & Bagchi, 2016). As a consequence, the financially excluded find participation in the financial marketplace too costly and unaffordable. The costs of participating in technology services is one of the factors that affect customers' adoption of the services as they have to invest in equipment, such as computers and smartphones (Golsefid & Kiakalayeh, 2016).

However, Yadav (2016) did not find costs to be among the active drivers of the adoption of e-banking. Golsefid and Kiakalayeh (2016) also did not find perceived costs to be significant in e-banking adoption in their study focusing on Tetjaret Bank customers.

The costs of an Internet connection is a barrier to e-banking adoption (Shankar, 2016). The World Bank (2014) also elevates the cost associated with factors, such as travel distance and paperwork associated with opening a bank account as one of the main barriers of bringing the poor into banking.

The findings of Premarathne and Gunatilake (2016) demonstrate that the key determinants of e-banking adoption include the number of people having access to the Internet and costs. Thus, based on these findings the present study propounds that the costs of e-banking, in terms of factors such as its pricing, will have a direct positive effect on digitally unbanked seniors' willingness to use these services. (as seen in figure 4.11).

H#7: e-banking services whose fees and charges suit the pockets of digitally unbanked seniors will have a positive effect on digitally unbanked seniors' willingness to use them.

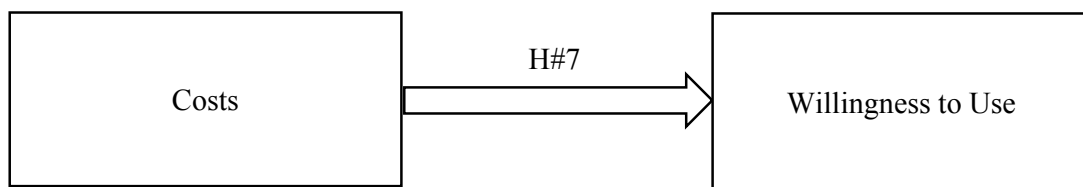


Figure 4.11: Costs factor hypothesis

Attitude strongly predicts the intentions of using e-banking systems (Nkoyi, Tait & van der Walt, 2019). When customers perceive that there is a benefit to using e-banking, then that positively impacts their attitude towards the service (Koenait, Chuchu & de Villiers, 2019). There is generally a correlation between customers' attitude and their intention to use technology. In a study focused in the Jordanian banking context, Alkailani (2016) established a positive correlation between attitude and intention to use e-banking.

Besides utility factors, compatibility with the e-banking system by customers which then leads to enjoyment when using it affects their attitude. Therefore, service quality issues, such as friendly designs are important to customers' attitude toward e-banking, impacting adoption (Puriwat & Tripopsakul, 2017).

A comprehensive literature review by Kasim et al. (2014) on studies focused on TRA and TPB found attitude to be the strongest predictor of technology adoption. The study by Chavali and Kumar (2018) found that customers that generally have a positive attitude towards e-banking turn to use it. Based on these finding, the present study propounds that digitally unbanked seniors' positive attitude to e-banking will have a direct positive impact on their willingness to use the services. (as seen in figure 4.12).

H#8: Digitally unbanked senior customers' positive attitude to e-banking will have a positive, direct effect on their willingness to use the services.

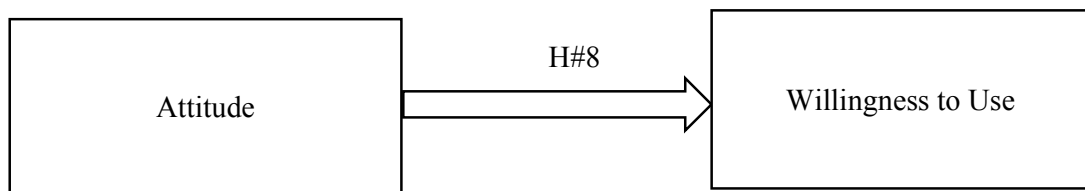


Figure 4.12: Attitude factor hypothesis

Table 4.3 (below) presents the present study's hypotheses.

Table 4.3: Variables and Hypotheses

Variable	Hypothesis	Figure #
Customer Involvement	H#1: Digitally unbanked seniors' involvement in the system definition, system design and system implementation of e-banking will have a direct, positive effect on their willingness to use the services.	Figure 4.4
Bank Initiative	H#2: The banks' initiative in the creation of support and awareness of the benefits of e-banking among digitally unbanked senior customers will have a direct, positive effect on these customers' willingness to use these services.	Figure 4.5
Design	H#3: E-banking services that are designed to suit digitally unbanked seniors, in terms of issues, such as their cognitive challenges, will have a positive, direct effect on these customers' willingness to use the services.	Figure 4.6
PEOU	H#4: e-banking services that are perceived to be easy-to-use will have a direct, positive effect on digitally unbanked seniors' willingness to use the services.	Figure 4.7
Trust	H#5: e-banking services that are seen to be trustworthy by digitally unbanked seniors will have a direct, positive effect on their willingness to use them.	Figure 4.9
Privacy and Security	H#6: e-banking services that are not private and secure will have a direct, negative effect on digitally unbanked senior's willingness to use these services.	Figure 4.10
Costs	H#7: e-banking services whose fees and charges suit the pockets of digitally unbanked seniors will have a positive effect on digitally unbanked seniors' willingness to use them.	Figure 4.11
Attitude	H#8: Digitally unbanked senior customers' positive attitude to e-banking will have a positive, direct effect on their willingness to use the services.	Figure 4.12
PU	H#9: E-banking services that are seen as useful by digitally unbanked seniors will have a direct positive effect on their willingness to use these services.	Figure 4.8

4.3.3 Population of the study, Sample and Sampling Methods

It is at times impractical and improbable for researchers to assess all the cases under their research, which results in the need for sampling. A sample is a small set of data in the form of persons, items or objects taken from a larger population using a predefined selection method (Rao & Fuller, 2017).

According to Taheerdost (2016), the following stages should be followed in the sampling process of a social research study:

1. Define the target population

2. Select sampling frame
3. Choose sampling technique
4. Determine sample size
5. Collect data

This process was also followed in this study and is explained below.

4.3.3.1 Target Population

A population in social research refers to a group of representative individuals, items or objects with relevant characteristics from which information can be collected (Alvi, 2016). Apart from understanding the population for the purposes of sampling, the researcher must be able to succinctly and clearly define it as that helps others appraise the study (Asiamah, Mensa & Oteng-Abvie, 2017).

The present study sought to develop an empirical framework on how banks can extend their e-banking services to bank digitally unbanked seniors. Consequently, the main focus of the study is an empirical analysis of the problems experienced by unbanked seniors to conduct digital banking. Therefore, in the context of the study, the target population is digitally unbanked seniors who are 60 years and older. The chosen pre-requisite for the target population's participation in the study, based on its aims and the problem statement as well as reviewed literature, was as follows:

- i. The person must be a senior citizen (60 years +);
- ii. The person (60 years+ senior citizen) must be digitally unbanked (not use e-banking), or fall within the classically unbanked persons category (not have a bank account); and
- iii. The person (60 years+ digitally or classically unbanked senior citizen) must have some form of frequent monthly income that enables them to partake in the financial markets (be bankable).

Based on the study's respondent participation criteria, senior citizens who receive monthly elderly social security grants in cash at the SASSA payments points were identified as the target population. SASSA pays elderly social security grants of R1, 675 cash every month to 3,408,994 senior citizens at various payment points throughout South Africa (SASSA Socpen, 2018).

The payments are made to the recipients in cash on presentation of a valid SASSA issued card and a valid identity document primarily because these individuals are unbanked, thus meeting the participation criteria of the study's population.

4.3.4 Sampling Design

Sampling refers to the process through which a sample, or a relatively smaller group of people selected for investigation purposes, is extracted from a population (Sharma, 2017). Rao and Fuller (2017) attribute the popularisation of sampling to Kiaer in 1897 when advocating the representative model, whose objective was for the sample to mirror the present finite population through purposive sampling or random selection methods.

There are two major categorisations of sampling techniques, namely, non-probability sampling methods and probability sampling methods. Non-probability sampling methods have limitations due to the subjective nature of choosing a sample that is not representative of the population and they are used often in cases where the population may not be well-defined (Etikan et al. 2016). Probability sampling, also called random sampling, is any sampling scheme whereby the probability of choosing each individual is the same (Sharma, 2017).

According to Etikan et al. (2016), probability samples mainly aims to achieve representativeness, which is the degree to which the sample accurately reflects the population. Non-probability samples, on the other hand, do not rely on the probability of elements in the universe taking part in the study as they are mostly purposive, such as quota sampling, expert sampling or modal instance sampling (Etikan & Bala, 2017).

Expert or judgement sampling method is a form of purposive sampling that involves choosing only people who are knowledgeable in the subject under research (Etikan et al. 2016). Modal instance sampling involves sampling the most typical members of the population, or the most frequently occurring cases (Etikan & Bala, 2017).

The present study applied a probability sampling method, because the study's population was well-defined and the research intended to derive results that are representative of the population. In particular, the study applied a multi-staged cluster sampling scheme. Multi-stage sampling divides a large population into stages to make the sampling more practical (Chaudhary & Singh, 2013).

Cluster sampling involves dividing the specific population of interest into geographically distinct groups (Henderson & Sundaresan, 1982). The benefit of the multi-stage cluster sampling is that it is economical (Nafiu, Oshungate & Adewara, 2012) and it is preferable for larger groups (Maskurul, Sharmin & Yasin, 2015).

The current study was granted unconstrained access to the social grants payment information by SASSA, in addition to the mechanisms and beneficiaries across South Africa's data. The SASSA data accessed by the study in relation to cash payments to seniors is demarcated according to South Africa's nine provinces. The demarcation variables within each province are:

- (i) The SASSA geographic district (which is aligned to South Africa's district municipalities' districts)
- (ii) SASSA cash payment point name (within each district)
- (iii) Payment point number
- (iv) Geo-location of the payment point
- (v) The number of social grants beneficiaries that the cash payment point services monthly

The majority of the SASSA payment points are located in community and municipality-owned buildings where senior citizen beneficiaries queue for their payments seated in rows of chairs in a "snake-like" queuing format. In addition, the accessed SASSA data showed that there is $n=3,408,994$ senior citizens in all nine provinces who receive social security grants as cash payments at pay-points throughout South Africa (SASSA Socpen, 2018). Given this large count and the geographic spread, it was felt that this would be too large a population to sample for the purposed of this study.

Equally to the deficiencies associated with smaller samples in studies, too large a sample can often lead to complexities and inaccuracies (Singh & Masuku, 2014). Therefore, for reasons of practicality and accessibility, the study eventually selected the Gauteng province as its data collection location and sampling base.

In terms of the SASSA data, the Gauteng province is demarcated into five SASSA geographic districts, including Johannesburg, West Rand, Ekurhuleni, Sedibeng and North Rand. The SASSA cash payments points in the five districts are well-defined and there is a total of $n=135$ payments points. The count of senior citizens paid in cash in all of the SASSA cash payment points in the Gauteng province is $n=149,715$. Based on this information, the study's sampling followed the cluster sampling process outlined below.

4.3.4.1 Study's cluster sampling

The five SASSA districts were considered to be naturally occurring geographic clusters. Within these district clusters, lies multiple SASSA payments points ($n=134$ payment points) which were treated as local clusters. Consequently, within each of the five district clusters, six local clusters were selected using the probability proportionate to population size (PPS) method. This means that the local clusters with more digitally unbanked senior citizens receiving social grant cash payments were more likely to be selected than those with fewer beneficiaries.

To achieve this, random numbers were generated for each local cluster and a total of 30 local clusters (six local clusters x five district clusters = 30) were eventually selected applying the PPS method. The PPS is a more precise estimator than simple random sampling (which accords each unit a chance to be selected), because it elevates the importance of the larger units (Paul, 2016). Table 4.4 (below) presents the present study's full sampling frame.

According to Maskurul et al. (2015), larger units have more apropos information than smaller ones and it is always ideal to select them. From the total 30 local clusters selected applying the PPS size method, the local cluster with the least number of senior citizen people (units) on the SASSA payment day equals $n=337$ and the local cluster with the most equals $n=4942$.

Systematic random sampling was used to identify 14 senior citizen people to participate in the study within each local cluster. Systematic random sampling is used when a sample can be drawn systematically rather than generating a simple random sample (Elsayir, 2014).

Upon arrival at the designated local cluster (payment point), the trained data collectors counted the number of senior citizens onsite, seated and queuing in a “snake-like” formation, awaiting their turn to collect their social grants payments, and divided the total count by 14 ($n/14=x$). This meant that every ‘xth’ senior citizen was sampled. This continued on every local cluster until a total number of 14 questionnaires were completed per site.

For example, on arrival at the Brakpan local cluster, which in terms of available data had a total of $n=337$ population, the data collector allocated to this local cluster divided the total population on site by fourteen ($n=337/14=24$) which totalled to 24. Thereafter, the collector proceeded to collect data from person number 24 in the queue, moving on to 48, 72 and so forth until a total of 14 questionnaires were completed.

Table 4.4: Study's Sample Frame

SASSA District Cluster	Area geo-ID	Sampled Local Cluster (Payment point)	Total # units	Sample units per local cluster	SASSA District Cluster	Area geo-ID	Sampled Local Cluster (Payment point)	Total # units	Sample units per local cluster
Ekurhuleni District Total # of local clusters = 26 Total # of district units = 45126	Springs	Bakerton	825	14	North Rand Total # of local clusters = 42 Total # of units = 24552	Bronhorspruit	Ekgangala	519	14
	Khathorus	DH Williams	4390	14		Mamelodi	Eersterus	328	14
	Germiston	Rabasothe	4868	14		Soshanguve	Falala	3089	14
	Benoni	Daveyton	4942	14		Ga-Rankua	Loate	381	14
	Springs	Tsakane	4816	14		Pretoria	Mus Park	2017	14
	Springs	Duduza	3293	14		Temba	Methodist	1136	14
Johannesburg District Total # of local clusters = 23 Total # of district units = 43949	Midrand	Diepsloot	337	14	West Rand Total # of local clusters = 30 Total # of district units = 23052	Kagiso	Kagiso	1681	14
	Soweto	Jabavu	4436	14		Dobsonville	Dobsonville	1905	14
	Joburg CBD	Hillbrow	1119	14		Roodepoort	Roodepoort	1115	14
	Lenasia	Lenasia	2660	14		Roodepoort	Coronation	422	14
	Soweto	Chiawelo	2049	14		Khutsong	Khutson	916	14
	Soweto	Mead Hostel	2289	14		Bekersdal	Bekersdal	448	14
Sedibeng District Total # of local clusters = 14 Total # of district units = 21036	Sebokeng	Bophelong	2631	14	Sample size = 420 (above minimum 250 recommended for SEM)				
	Vereeniging	Vaal Marina	1159	14	The 5 SASSA districts (Ekurhuleni, West Rand, Sedibeng, North Rand, Johannesburg) considered naturally occurring clusters				
	Sebokeng	Mpho-Sphiwe	6168	14	The 134 SASSA payments points considered local clusters				
	Mafatsane	Evaton	4881	14	PPS used to derive the 30 local clusters (6 per district)				
	Mafatsane	Residentia	1572	14	Systematic random sampling used to select participants per local cluster (n/14=x)				
	Heidelberg	Ratanda	1817	14					

The study's data collection within the local clusters did not proceed without challenges. In fact, challenges were experienced in approximately 60% of the local clusters where on certain data collection days, the number of senior citizens in the queues were insufficient to conclude the collection of all 14 questionnaires on a single day. This resulted in multiple data collection days being necessary in these local clusters in order to cover the required questionnaire count. SASSA allocates up to eight consecutive payment days per local cluster to complete payments at any given monthly payment cycle and this provision assisted the study to align the multiple data collection days at local clusters where insufficient questionnaires were completed.

In addition, in some local clusters the study experienced refusals from the sampled queuing senior citizens, which resulted in reduced numbers on certain data collection days. The refusals were predominantly driven by the sampled participants' refusal to provide their names on the consent forms, which resulted in data collection terminations.

It is possible that the sampled participants were concerned about unforeseen consequences that may befall them if they provided their personal details to the study, despite the confidentiality assurances that were provided. Given that the payments run for eight consecutive days in the first two weeks of the month in each site SASSA pay-point, data collection was rescheduled for alternative days in the areas affected by refusals or when fewer than expected completed questionnaires were obtained.

4.3.5 Sample Size

Sample size plays an important role in every statistical technique applied in practice (Marcoulides & Saunders, 2006). However, estimating a sample size in research studies remains a noticeable challenge (De Carvalho & Chima, 2014; Lacobucci, 2010). There are varying literature recommendations for sample size requirements in SEM studies.

Wolf, Harrington, Clark and Miller (2013) found the requirement of a sample sizes to range from 30 cases for a simple Confirmatory Factor Analysis (CFA) with four indicators and loadings of around 80, and up to 460 cases for mediation models. According to Hu and Bentler (1999) the minimum required sample size is 250, because there may be the tendency for combination rules of absolute and relative fit indices to over-reject models if the sample size is equal to, or less than 250.

The net required sample size that was calculated by this study's designated statistician was $n=383$. However, the sample size was adjusted to $n=420$ to allow for any situations that could arise from incomplete data stemming from the collected questionnaires. Therefore, the sample size that was utilised was $n=420$. As described below, in the data collection section of the thesis, the present study's data collection returned a 100% success rate.

In summary, the present study's sample size was calculated sufficiently above the 250 minimum recommendation for SEM studies (Hu & Bentler, 1999). The study's sample size also falls in the upper end of the range identified by Wolf et al. (2013) using the Monte Carlo data simulation techniques to evaluate sample sizes for common applied SEMs.

4.3.6 Data Collection Instrument

The present research proposes, as its main contribution, an empirical framework on how the banks can extend their e-banking services to bank digitally unbanked seniors, as conceptualised following the literature review. The thesis then empirically researched challenges that seniors experienced with digital banking. The philosophical posture of the study was positivist and the study utilised a quantitative research method. Therefore, the study's data was collected via a structured questionnaire.

The study's questionnaire was divided into two parts: Part A, which focused on the demographic information of the participants and Part B: that collected data on e-banking factors aligned to the research questions and the study's objectives. The questionnaire applied statements relating to ten e-banking latent constructs on a 5-point Likert scale reflecting a favourable ("strongly agree") or unfavourable ("strongly disagree") position at each extreme end.

Stemming from the reported existing literature, the questionnaire consisted of 45 self-reported items for all the measures. Existing literature was also referenced to ensure that the questionnaire consisted of comprehensive measures for each construct. Therefore, except for minor adaptations to suit the objectives of the study, all the items in the measures have been previously empirically tested.

The measures each for PEOU and PU consists of four items (adapted in the present study from the original TAM measures by Davis (1986) and as used in subsequent studies [for example, Phuong & Vinh, 2017]).

PEOU measure statements:

As a senior customer, I would be willing to use e-banking if:

- *It was easy for me to use*
- *It did not require a lot of effort from me*
- *It was easy for me to become skilful in using it*
- *Using it enabled me to manage my money affairs more easily*

PU measure statements:

As a senior customer, I would use e-banking if:

- *It was useful in my banking*
- *It improved my banking experience*
- *It helped me complete my banking tasks more quickly*
- *It increased the effectiveness of my banking*

To measure the e-banking “trust” factor, four items were adapted from, and as validated in prior research by, the study conducted by Dixit (2010). The items contain statements that related to the population’s willingness, or not, to use e-banking based on the items measuring the effect of their trust of the system, as well as the banks providing it. This is contained in a statement on ‘trust’ stated in a positive phrasing.

Trust measure statements:

As a senior customer, I would be willing to use e-banking if:

- *I could trust it*
- *If I could trust the bank providing it*
- *If I was given sufficient protection to ensure that I would not fall victim to fraud scams and lose money*
- *If it (e-banking) always provided accurate, up-to-date results*

The measure for the effect of cost of e-banking on digitally unbanked seniors' willingness to use it, applied three items adapted from measures used in prior research (Mukthar, 2015; Wu & Wang, 2005). The prior validated items contain positive statements on whether digitally unbanked seniors would be willing to use e-banking as a result of barriers associated with costs.

Cost measure statements:

As a senior customer, I would be willing to use e-banking if:

- *If it cost me less to use it compared to traditional 'in the bank' banking*
- *If I was not required to spend money on upgrading/purchasing equipment in order to use it*
- *If the bank didn't charge me high fees to use it*

The six validated items for the measurement of "attitude" were also gained from Wu and Wang (2005) and three items were adapted from Dixit (2010).

Attitude measure statements:

When it comes to using e-banking, as a senior customer my attitude is:

- *I like the idea of using it*
- *I think that using e-banking is a good idea*
- *Using e-banking appeals to me*
- *e-banking could be exciting*
- *e-banking could be advantageous for me*
- *I could enjoy the challenge of e-banking and find it stimulating*

E-banking platforms are IT-based and the design of the front-end interface for users is usually similar to a normal computer interface, irrespective of whether the user is banking via the ATM, mobile smartphone or home computer. Consequently, the study selected five items to measures for "design", which were adapted from Ling, Ferna, Boona and Huat (2016) regarding web interface design measures in their study of customer satisfaction with Internet banking in Malacca.

Design measure statements:

As a senior customer, I would be willing to use e-banking if:

- *It was designed such that information is easily accessible*

- *It was designed such that information is displayed in a readable way*
- *It was designed such that information on the system interface is understandable for me*
- *It was designed such that the banking steps that I must follow were quick for me to do my banking*
- *It was designed such that it was simple for me to do my banking using it*
- *It was designed specifically for people like me in terms of its features (e.g. large clear font), as I have different needs to younger people*

Measures for “privacy and security” were adapted from the measures by Ndlovu and Sigola (2013) in terms of the risks associated with the use of e-banking, and the measures applied by Lia and Chueng (2002).

Measures statements for privacy and security:

As a senior customer, I would be willing to use e-banking if:

- *It was sufficiently secure to bank with it*
- *The bank providing it had the expertise to ensure that my banking information is kept private*
- *My banking behaviour remained confidential*

Customer involvement in the co-creation of products and services is listed in previous studies as a means of creating customer value (Sheth, Sisodia & Sharma, 2000). The outcome of collaborations between the supplier and the customer is a unique and focused customer solution (Vettelri et al. 2016).

The five items to measure customer involvement in the questionnaire were adapted for the study from the measures developed by Baroudi et al. (1986). The original measures were not necessarily designed for users in the services context of consumers of ICTs, such as e-banking.

Baroudi et al. (1986) conducted empirical research of the impact of user involvement on systems’ usage and information satisfaction and tested the measures utilised for CI in the present study. Describing the rigorous process of developing the measures, the authors resolved on items that measure involvement in a number of activities and stages in the SDLC (Baroudi et al. 1986), which included – system definition, system design, and system implementation.

The items measuring customer involvement in the study related to measures of seniors' involvement in the e-banking SDLC insofar as their user requirements are concerned. Five items were used with positive statements.

When finally implemented, a system, such as e-banking must serve specific requirements of the intended user. The third statement in the questionnaire regarding CI measures sought to gather responses that answer this factor from a system implementation standpoint. The fourth and fifth statements were moderating statements of the first and third statements.

Customer involvement measure statements:

As a senior customer, I would be willing to use e-banking if:

- *The bank involved me in its creation before it is developed*
- *I was able to have input into the system development regarding the required banking steps*
- *I was able to share my insights about my specific needs and wants as a senior customer in the banking process*
- *I was able to make it suitable to my needs*
- *I was part of the process of developing it*

Creating awareness and support around e-banking as a bank initiative has been identified as an important adoption factor (Mavetera et al. 2014). The measures for the “bank initiative” (BI) factor that were selected are five in total (adapted from similar measures used in other research that include Dixit (2010) (packaged under his Innovativeness and Awareness factors), as well as items applied by Arenas-Gaitánt et al. (2015) to measure customer awareness of the benefits of e-banking.

The present study's questionnaire items for the collection of data on BI contained a total of five positive statements. While the selling point of e-banking for the banks is reduced operating costs (Ndlovu & Sigola, 2013), benefits such as convenience are proven to serve customers' appeal and these aspects are also punted by the banks in their marketing communication.

Bank initiative measure statements:

As a senior customer, I would be willing to use e-banking if:

- *The banks created awareness about its existence*

- *The banks went out of their way to work on promoting its benefits to people like me*
- *The banks convinced me that e-banking was better*
- *The banks provided me training on how to use it*
- *The banks made available someone that I could contact on how to use it*

A total of five items were utilised to measure the “willingness to use” factor. The items were adapted from the items used by Alexander, Lynch and Wang (2008) that they utilised to evaluate 22 electronic consumer products. Similar to the present study, the participants were asked to illustrate their level of agreement or disagreement with statements that measured their willingness to use from both their behavioural aspects and incentive.

Willingness to use measures:

When it comes to my preparedness to use e-banking:

- *I am willing to try e-banking*
- *I am willing to start using e-banking services in the future*
- *I am willing to try e-banking for my basic daily banking needs*
- *I am willing to change my present banking behaviour so that I can enjoy the benefits that e-banking offer*
- *I am willing to move to e-banking if I am assured of help from the bank*

4.3.6.1 Validation of the Questionnaire Content

The validity of the content of the questionnaire was undertaken on four inter-related levels, which was deemed necessary. The first level of the instrument’s content validity was undertaken by the study’s dedicated statistician. The purpose of this level of content validity was to answer as to whether, from a statistical perspective, the questionnaire measures covered all the relevant factors sufficiently to answer the research questions (Agariya & Singh, 2012). This was deemed an indispensable pre-emptive data quality management measure.

In addition, a panel of two academic experts who were not associated with the study, but who had professional expertise in the technology diffusion and adoption topic were invited to ensure content validity of the questionnaire. This level of validation was necessary for ensuring that the data collection instrument was relevantly associated with the study’s area of research and the stated research gap that was identified prior to the undertaking of the study.

Furthermore, a random sample of three digitally unbanked seniors who fit the profile of the study’s target population were used to conduct a test of ensuring that the instrument was valid from a practical implementation perspective. This exercise also confirmed the validity of the interview-driven data collection method and the face-to-face administration of the questionnaire (as discussed in section 4.3.7 below).

In addition, a pilot study was undertaken and the outcomes were used to make necessary adjustments to the questionnaire and the data collection strategy. The aim of the pilot was to ensure that any ambiguities pertaining to the data collection instrument and strategy were ironed out prior to a full-scale data collection exercise being implemented. A total of ten digitally unbanked seniors participated in the pilot study.

Table 4.5: Illustration of the instrument validity population

# of Instrument validators	Description	Purpose
n2	Academic experts with subject matter expertise in the technology diffusion and adoption topic.	Content validity
n1	Statistician	Statistical applicability
n10	Pilot study	Assessment of the reliability of the questionnaire measures

4.3.7 Data Collection Method

In this study, a structured questionnaire survey was used as a data collection method. Structured questionnaire survey methods of data collection can differ from the means used to reach respondents, the medium of delivering the questionnaire or even the manner in which the questions are administered. Questionnaire-based data collection can be self-administered, interview-driven or conducted via the telephone, cellular, postal or with advances in technology, they can be web-based self-administered or sent via email or text message (Miller, 2017). These data collection methods can be applied individually or in a mix-mode depending on the circumstances informing the design of the study.

For the purposes of this study, a paper-based, structured questionnaire survey was used. A face-to-face interview-driven mode of structured questionnaire survey data collection was used specifically. Trained data collectors read out the questionnaire questions as well as response options from the structured questionnaire to each respondent and completed the questionnaires on the respondents' behalf. This data collection method was adopted in order to accommodate the special circumstances relating to the cognitive and literacy challenges that are generally faced by digitally unbanked seniors in developing countries.

Ahmed et al. (2018) argue that data collection using a paper-based questionnaire can be time-consuming and return errors compared to a smartphone-based questionnaire format. However, some research studies have not found fundamental differences in relation to the quality of the data collected, or the time spent collecting data, applying different survey data collection modes. For example, Ortiz et al. (2016) found no differences in terms of time and data quality when comparing face-to-face and telephone versions of the Brazilian Dental Health survey questionnaire.

Alshenqueeti (2014) argues that the face-to-face interviewing of respondents as a data collection method for quantitative research has the potential for inconsistencies as the interview with any one party can be different with that with another. According to Adhabi and Anozie (2017), the training of data collectors is an important mediator of data quality in interview-driven data collection modes. Therefore, the detailed training of data collectors was incorporated as an important data quality mitigation in this study.

Bianchi, Biffignandi and Lynn (2017) guide that the selection of any one version of the available data collection methods in research is generally the study's choice guided by its design, complexity and practicality. Therefore, based on the current study's objectives and to mitigate any challenges associated with the targeted population, a structured questionnaire-based interviewer-administered survey was applied, because it was deemed the optimal choice under the circumstances of the study.

In addition, securing effective respondent participation was one of the primary motivating factors for the selection of the interviewer-administered mode of data collection. The study applied systematic random sampling when collecting data inside the sampled SASSA local clusters.

This ostensibly meant that the data collectors had to apply a set method of identifying participants standing in the queues, introduce the study and request the respondents to participate. The study anticipated that the quality of the data and extent of the commitment of the participants in answering the questionnaire questions as accurately as possible would be compromised if a self-administered approach was utilised.

According to Miller (2017), face-to-face, structured questionnaire surveys, among other survey data collection modes, have been providing valuable data for conducting social research for decades, because they provide quality data. The benefit of the interviewer-administered questionnaire method stems from the intervening role that the interviewer plays in the perceptual process, as well as ensuring that all the questionnaire questions are completed (Jenkins & Dillman, 1995). The interviewer is able to identify non-verbal cues on the side of the respondents and quickly clarify the question under consideration.

The onus of perception is placed on the respondents in a self-administered questionnaire, and is often associated with errors (Ponto, 2015). This risk of these kinds of errors was deemed too high to ignore, considering the underlying assumptions about the target population. The chosen data collection method was also decided upon to eliminate the potential of missing data emanating from participants' lapse in concentration or interest during the study's data collection due to their other pressing demands on the day, had a self-administered questionnaire mode been adopted.

Data was collected at the SASSA pay-points (local clusters) on the day on which the targeted population received their monthly social grants cash disbursements. The study envisaged that the participants' primary concerns on their pay-day at the pay-points will be (i) to receive their social grant money in full, and (ii) heading off to get the basic necessities for their households that would most likely be depleted at that stage. Thus, without the mediating effect of an interviewer that would have gained affinity with them, their level of concentration on the research would likely be diminished by these personal interests.

Furthermore, according to Sakshaug, Hülle, Schmucker and Liebig (2017), research in Germany and the US found that interviewer-administered studies received better consent return from respondents for sensitive topics. The present study dealt with the financial management affairs of digitally unbanked seniors and their challenges with e-banking, which was deemed a sensitive topic.

Initially, the study appointed a data collection service provider to assist with data collection. A group of ten data collectors attached to the service provider were trained by the researcher in all aspects of the study and the data collection methodology. The training of the data collectors covered aspects, such as the aims of the study, administering the questionnaire, capturing the responses on the questionnaire, and administrative issues, such as obtaining respondents' signed consent, the safe keeping of completed questionnaires, as well as the confidentiality and assurances to participants.

In addition, the data collectors were prepared to anticipate the challenges that they could experience when engaging the study's population given their age. For example, it was anticipated that most digitally unbanked seniors would possess minimal knowledge of the latest banking trends, such as e-banking and the data collectors were empowered with information to unpack this notion in a simplified manner.

Furthermore, data collectors were trained in the application of the probability sampling method in relation to the participants in the queues in line with the sample frame on each data collection site. The latter was singled out and emphasised as a data credibility issue requiring strict adherence. However, the returned questionnaires were deemed to have collated unusable data by the study's dedicated statistician.

Consequently, a second round of data collection was undertaken by the researcher in person, assisted by ten trained university post-graduate students. The data collectors were also selected on their ability to speak the predominant languages used in each of the 30 data collection sites. The data collectors were trained in the same format as the first group that conducted the unsuccessful round of data collection. The second round of data collection returned a 100 percent rate of completed questionnaires. The collected data was deemed to be of good quality by the study's statistician and it was analysed and utilised to compile the study's findings.

4.3.8 Internal Validity of the Research Design

The focus of internal validity is to determine whether the relationships within a particular data-set are causal. Internal validity measures causal relationships between dependent and independent variables and rules out alternative explanations for the dependent variable. The study utilised ten latent constructs.

CFA was used to test for the validity of all the study's latent constructs. As reported in Chapter 5, all of the study's latent constructs met the required construct composite validity and reliability thresholds.

4.3.9 External Validity of the Research Design (Generalizability)

External validity refers to the extent to which the findings of a research study can be generalised to, and across, different settings, persons and times. The study applied probability sampling to obtain a representative sample for the generalisation of the results within its population of digitally unbanked seniors.

In this regard, multi-cluster sampling was applied and this was followed by systematic random sampling. Consequently, this approach enhanced the generalisability of the study's findings.

4.3.10 Ethical Considerations

Ethical issues are a critical component of social research. According to Madushani (2016), research ethics refers to the set of values, standards and institutional schemes that help constitute and regulate research. Consequently, it is compulsory for researchers involving humans to obtain ethical clearance and this rule is enforced strictly by the UNISA School of Business Leadership.

The focus of the present research study is to investigate how the banks can utilise e-banking to bring digitally unbanked seniors into the mainstream financial marketplace, thus contributing to financial inclusion. Therefore, the study involves human participation in the form of digitally unbanked seniors – who, according to the literature, can be categorised as falling within the “vulnerable persons” category.

As a result, ethical clearance was applied for with UNISA's School of Business Leadership Ethical Clearance Committee. After interrogating the application, the Ethical Clearance Committee granted the study the requisite ethical clearance prior to any field work being conducted as it was deemed to meet the set values, standards and institutional schemes (the ethical approval letter is attached as Annexure 9).

Informed Consent

An informed consent form was developed that received institutional approval from UNISA and every respondent consenting to their participation signed it. The consent form declared the intentions of the research to the participants, addressed issues relating to the voluntary nature of participation and that there were no direct incentives, as well as the approximated length of time required to complete the questionnaire. In addition, participants were assured of their anonymity and confidentiality of their personal information, together with the manner in which they would be able to access the research findings.

The function of the informed consent form is to provide detailed information about the study to the participants so that they are empowered to make informed decisions about their participation. In addition, the informed consent provides participants with information and assurance about their rights when choosing to participate in the study.

The purpose of attaining informed consent is basically to ensure that the people who are participating in the study are well informed about what the research entails, as well as their rights in relation to their participation. This was achieved in the study and copies of the consent forms were signed by the individual participants. These signed consent forms were attached to each questionnaire for record keeping and stored according to UNISA's guidelines for storing research records.

No Harm

The national statement on research harm states that all research involving human participation should be conducted ensuring that participants are respected, benefits are maximised and harms minimised, harm is not done, and subjects in the research are treated equally (Akpabio & Esikot, 2014). The present study posed no potential risk or harm, either directly or indirectly, to its human participants and no harm was experienced whatsoever.

Institutional Approval

Given that the study's population primarily constituted senior citizens receiving social security disbursements from SASSA, and that data collection took place at SASSA payment points in Gauteng that were sampled as local clusters, permission was sought from, and granted by, SASSA to carry out the study. The Letter of Permission granted by SASSA to the study is attached as Annexure 8.

Confidentiality and Anonymity

The confidentiality and anonymity of human participants in social research is an important ethical consideration for all researchers. In studies involving vulnerable groups such as the elderly, as in this case, issues of confidentiality and anonymity are even more important. Vulnerable groups refer to human participants in social research that are generally susceptible to harm and exploitation and who should be protected (Surmiak, 2018).

The anonymity of the participants and their confidentiality was guaranteed during all the phases of the research. The introduction of the participant consent forms in the study's data collection made explicit the participants confidentiality and anonymity, especially given that the questionnaire did not record any personal information of the participants. Furthermore, the participants' identity were protected through the non-usage of personal information.

Compensation

Participation in the present study by its human subjects was not accompanied by any form of material incentive or compensation and that was made explicit in the study's consent form. Compensation usually occurs when respondents incur direct costs to offer their opinions in relation to the study. Data was collected from participants queuing at the sampled SASSA data collection local clusters and, as a result, there were no costs incurred by the participants that were directly related to their participation in the study, as they were already on-site to collect their monthly social grants payments.

4.4 DATA ANALYSIS

The aim of study was to develop an empirical framework on how banks can bank digitally unbanked seniors. Scores gathered from the survey questionnaires were used to analyse the study's data. Each response from the participants on the questionnaires was manually recorded on an Excel spreadsheet.

The Statistical Package for Social Sciences (SPSS) was then used to describe data through frequency distributions, means and percentages. Inferential statistics in the form of hypotheses testing were used to test the study's hypothesised modelled conceptual framework using the SEM technique. The measurement model in SEM technique was used for CFA using Analysis of Moment Structures (AMOS) version 5, followed by the specification and estimation of the model.

SEM has become the most commonly social science research technique (Rahman et al. 2015). In Chapter 5, the use of SEM in the study is explained in more detail and this discussion incorporates the criteria for model specification, fit indices deployed by the study and the results of the SEM analysis. The following are the advantages associated with the usage of SEM that informed the choice of this method in the present study:

- SEM is powerful in examining the cause-and-effect relationships between a number of independent and dependent variables (Ong & Puteh, 2017)
- SEM helps a researcher identify which models fit and can pinpoint what particular aspects of the model are in conflict with the data (Rahman et al. 2015)
- SEM measures and reveals relationships among hidden structures that are not directly measured (Civilek, 2018)
- SEM is useful in social sciences in that it is powerful in theory development and its capability in answering different questions through its quantitative techniques (Shaheen et al. 2017)
- SEM is more suitable for testing hypotheses than any other model, as it confirms the correspondence of the data of the relations in the theoretical model (Civelek, 2018)
- Unlike other regression approaches, the possible mistakes of the measurements of observed variables are considered (Jeon, 2015)
- Multiple statistical methods are applied in one model with SEM (Civelek, 2018)

There are some limitations of SEM, however:

- It can be incorrectly applied (Jeon, 2015)
- The best supported model can depend on sample size, wherein simple models are favoured when sample size is small (Jeon, 2015)

Despite the limitations of SEM, this analysis technique was applied in the present research study, because its advantages were deemed to be beneficial when the study's aims and objectives were considered.

4.5 CONCLUSION

Chapter 4 defined the universe and the study's philosophical posture. The chapter also presented the study's variables and hypotheses. In addition, the study's research methodology was presented and explained as quantitative research, which finds its origins in the natural sciences.

The study's population and sampling methods, as well as its data collection procedures were explained in Chapter 4. The population comprised of digitally unbanked seniors collecting their social grants payments in cash at SASSA payments points nationally and the payment points constituted local clusters in the study's multi-stage sampling frame. A multi-stage sampling procedure was utilised by the study and data was collected from a total of 30 local clusters that were spread across five district clusters through a systematic random sampling technique.

The study's data collection instrument and data capturing methods were also discussed. A structured questionnaire with a 5-point Likert scale comprising statements measuring the study's constructs was administered by trained data collectors. Chapter 4 concluded by outlaying the study's ethical considerations, validity and reliability as well as briefly describing the advantages of the usage of SEM as the study's data analysis technique.

The following chapter (Chapter 5) presents and discusses the study's findings. In Chapter 5, the utilisation of SEM is discussed in more detail, including criteria for model specification, fit indices, as well as the results of the SEM analysis. Chapter 5 also discusses the CFA findings for each latent construct, the testing of the path model and the study's empirical results, including the interweaving of the results with existing theory.

CHAPTER 5

SAMPLE DEMOGRAPHICS, DATA SCREENING, STRUCTURAL EQUATION MODEL TESTING & FINDINGS

5.1 INTRODUCTION

The previous chapter (Chapter 4) discussed the present study's research methodology and research design in detail. The present chapter (Chapter 5) has the following goals immediately after this introduction:

- Briefly describe the survey method, sample response rate, demographic characteristics of the study's respondents as well as the key features of their financial circumstances (5.2);
- Discuss data management procedures in relation to missing data and data entry (5.3); and
- Structural Equation Modelling (SEM) (5.4).

These discussions include:

- The Use of SEM (5.4.1), Criteria for Model Specification (5.4.1.1), Fit Indices (5.4.1.2);
 - Results of SEM Analysis (5.5), including CFA Results for Individual Constructs (5.5.1), Measurement Model Fit (5.5.2), Testing for Reliability and Validity (5.5.2.1); and
 - Testing of Path Model (5.5.3).
 - Discussion of results findings (5.5.4)
-
- Findings entwined with theory (5.6);
 - The extent to which the empirical results enabled answering the research questions (5.7);
 - Results verified by expert group (5.8);
 - Conclusion (5.9).

Klopper's (2009) research problem-solving approach that was followed in this study, emphasises alignment throughout the research phases. In terms of this approach, a research problem is unpacked into various sub-problems that are inter-related and aligned to the study's aims and objectives after which research questions aligned with each objective are formulated (Klopper, 2012).

Thereafter, data sources with appropriate measures are aligned to the research questions to ensure that the outcomes of the analysis adequately resolves the study's problem (Klopper, 2012). Given that the study adopted a single method of data collection, via a survey questionnaire, then that survey questionnaire was the single source of data. Table 5.1 provides the links established according to Klopper's (2009) research problem-solving approach.

Table 5.1: Research problem, aim, questions and questionnaire links.

General Problems	General Aim	Research Question	
Digitally unbanked seniors are reluctant to adopt banking Information Technology (IT)	To identify ways that banks can convince digitally unbanked seniors (as defined in the study) to use e-banking.	What e-banking usage and system development process factors should the banks consider to convince digitally unbanked seniors to bank electronically, thereby assisting the achievement of financial inclusion goals?	
Sub-problems	Objectives	Sub-questions	Questionnaire Link
The effect of involving digitally unbanked seniors in the e-banking system development lifecycle regarding their willingness to use it is unknown	To determine the effect on willingness to use e-banking of involving digitally unbanked seniors in system development cycle of these services	What is the effect of involving digitally unbanked seniors in the system development cycle on their willingness to use e-banking?	Part B: Q1 and Q10
The e-banking design requirements of South Africa's digitally unbanked seniors are still to be established	To specify South Africa's digitally unbanked seniors' e-banking design requirements	What are South Africa's digitally unbanked seniors' design requirements of the banks' e-banking system?	Part B: Q4
The support that digitally unbanked seniors require from the banks, from e-banking benefits awareness and empowerment in using the services, is still to be determined.	To determine the effect of banks' e-banking awareness and empowerment efforts on digitally unbanked seniors use	What is the impact of the bank's e-banking awareness and empowerment strategy on digitally unbanked seniors' use of the system?	Part B: Q2
Factors that are important to South Africa's digitally unbanked seniors' e-banking use are still unknown	To specify factors that are important to South Africa's digitally unbanked seniors' use of e-banking	What are the adoption factors to motivate digitally unbanked seniors' use of e-banking?	Part B: Q3 (PEOU) Part B: Q5 (TRU) Part B: Q6 (PRIV) Part B: Q7 (COST) Part B: Q8 (ATT) Part B: Q9 (PU) Part B: Q10 (WTU)

5.2 SURVEY

A summary discussion of the study's survey method, the sample response rate, demographic characteristics of the respondents as well as features of the respondents' financial affairs management is presented in this section. The study's data was collected by means of a structured questionnaire. As discussed in Chapter 4, the current study applied an interviewer-administered, structured questionnaire survey, data collection method. This method was preferred against the self-administered structured questionnaire data collection survey method, given the unique circumstances of the study, especially the dynamics associated with the population.

The present study primarily targeted digitally unbanked senior citizens, some of whom it was anticipated would have cognitive, or other challenges, as noted in existing literature (Iancu & Iancu, 2017). As a result, these factors could present a barrier if a self-administered questionnaire was applied. Therefore, an interviewer-administered survey was selected.

5.2.1 Demographics and characteristics of respondents

The respondents' demographics in terms of age, race, gender and level of education are presented in this section. This demographical data has no material impact on the level of analysis, but it is considered to be relevant information for providing a generalised view of the study's population.

Since the range of age seniority adopted in the study is 60 years, or more, in line with the World Bank's (2014) age categorisation, it is an important aspect of this research to understand the population in terms of the frequencies of the various other general seniors' age categories. For example, the fact that seniors experience cognitive challenges at different age levels (Iancu & Iancu, 2017; Olphert & Damodaran, 2013). Consequently, seniors' cognitive challenges often tend to impact their attitudes towards technology innovations negatively (Camilleri & Grech, 2017). Thus, knowing precisely which senior age categories the study's population generally belongs to, helps with contextualisation.

In addition, the respondents' levels of education is also important because it has an impact on technology adoption. Highly educated people, and those skilled in using technology applications, have higher thresholds in their propensity to adopt e-banking (Alwan & Al-Zu'bu, 2016; Izogo, Ogbuji, Onucha & Kalu, 2012). Therefore, a global view of the

education levels of the respondents serves as a useful insight into the findings based on the study's population.

Respondents' Gender

The split between males (56.3%) and females (43.5%) was almost even among the study's survey participants. Even though this demographic data is not material to the analysis, it is an interesting observation that they are in line with reported global ageing trends between males and females (Golant, 2017; World Health Organization, 2015; Kelly et al. 2015).

Respondents' Age

A majority of 63.4% of the study's surveyed respondents were between the ages of 60 and 70 years old. Persons aged 71 years to 75 years constituted 25% of the participants, while those that are 76 years+ constituted 11.5% of the respondents.

Respondents' Race

The study did not specifically target any particular racial groupings by design. As a result, part of the demographic data collected included the racial identification of the respondents. The frequencies of the demographic profiles data shows that Black Africans constituted the majority of the survey respondents (94.7%), followed by Coloured (3.8%), Indians (1.2%) and Whites (0.2%). The study's respondents were constituted by elderly recipients of SASSA social security grants, whose primary beneficiaries are the previously disadvantaged, poor black communities. Therefore, this could be the explanation of the study's racial demographic data finding as it parallels South Africa's inequality history.

Respondents' Level of Education

The participants were required to indicate an option that best described their level of education in the structured questionnaire. The options included "no formal education", "some/all primary schooling", "some high schooling", "matric", "post matric qualification in the form of a degree/diploma", and "higher degree".

42.6% of the respondents have no formal education, while 28.2% completed some or all of their primary schooling, 16.5% have some high school education. Of the respondents, 11% of the respondents completed matric, 1.4% are educated to degree level and only

0.2% have a post degree qualification. The finding that just under half of the respondents (42.6%) have no formal education are not contradictory to financial inclusion literature in terms of education being one of the barriers to banking. The process of opening a bank account often requires the completion of forms, which becomes impractical for applicants who do not have formal education. Park and Mercado (2015) found that demographic characteristics, such as education had an impact on financial inclusion in developing Asia. Therefore, the study's results confirm on the general profiles of the global unbanked as primarily constituted by the poor and less educated people (World Bank, 2014). Table 5.2 presents the frequencies of the respondent's demographics.

In addition, the individual's level of education defines their access to opportunities. The higher number of participants that have no formal education could demonstrate that they did not enjoy heightened exposure to opportunities in their lifetime and that is the reason they rely on monthly government's social security assistance as income.

Table 5.2: Respondents' Demographics

Demographic feature	Frequency	Percent
Gender		
Male	236	56.5
Female	182	43.5
Total	418	100.0
Age		
60-65	129	30.9
66-70	135	32.5
71-75	104	25
76+	48	11.5
Total	416	99.5
Missing	2	.5
Race		
Black	396	94.7
Coloured	16	3.8
Indian	5	1.2
White	1	.2
Total	418	100.0
Level of education		
No formal education	178	42.6
Some/all primary school	118	28.2
Some high school	69	16.5
Matric	46	11.0
Degree/ diploma	6	1.4
Higher degree	1	.2
Total	418	100.0

5.2.2 Key features of the respondent's financial affairs

In order to be considered bankable, digitally unbanked senior citizens must possess some form of consistent and frequent income. The survey participants were asked to provide this information in the structured questions. Income options including “pension”, “monthly stipend from family”, “monthly SASSA social grant pay-out” and “other” income sources not specified were provided.

A binomial test was applied to test if a significant proportion of participants responded “yes” or “no” to any of these options. A significant number of 417 (nearly 100%) of the study's respondents indicated that they received income in the form of the state social security stipend from SASSA, $p < .0005$. This finding is unsurprising given that, for practical reasons, the study narrowed its population focus to digitally unbanked seniors receiving their social security grants in cash at various payment points.

However, the finding also proposes support of general literature findings that there is a link between financial exclusion and poverty, or the financially excluded peoples' levels of income. The World Bank (2014) notes the impact of financial inclusion in poverty reduction. Rajasekaran (2018) found that in India, income is positively related to financial exclusion.

Significant numbers of the present study's respondents do not receive income from: monthly pension pay-outs (89%, $p < .0005$); stipends from family (97%, $p < .0005$) and other means (97%, $p < .0005$). Twelve (3.3%) respondents received income from other sources that included business (Tuck/Spaza shop [4], loan shark [1], small business [2]), employment (4) and rental income (1). Figure 5.1 presents the frequencies of the various sources of income identified by the study's participants.

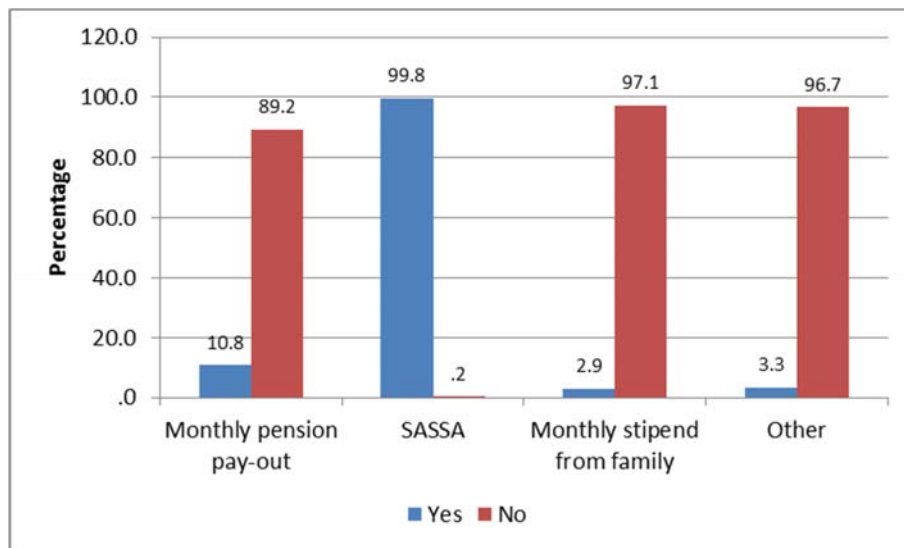


Figure 5.1: Sources of monthly income

Personal benefits of e-banking for the individual, include access to all-hour banking all-day, remotely from anywhere for a person with an Internet connection. Therefore, the beneficiary can manage their financial affairs much better and conveniently. Consequently, it becomes important to understand the financial affairs' management circumstances of digitally unbanked seniors as that will become a determinant of their enjoyment of e-banking benefits.

The study's participants were asked to indicate who is responsible for the management of their financial affairs. The structured questionnaire provided the following options: "I manage my own financial affairs", "I receive assistance from a family member", "a neighbour/friend assists me to manage my financial affairs", "a social worker helps me", or "other" source, which they had to list.

A binomial test was applied to test if a significant proportion of participants responded "yes" or "no" to these options. As can be seen from Figure 5.2 (below), a significant 330 (nearly 80%) of digitally unbanked seniors indicated that they managed their financial affairs in person, $p < .0005$. Significant numbers indicated that they do not receive assistance with the management of their financial affairs from: "a family member" (83%, $p < .0005$); "a neighbour/friend" (98%, $p < .0005$) "a social worker" (98%, $p < .0005$) or "other" sources of assistance (100%, $p < .0005$).

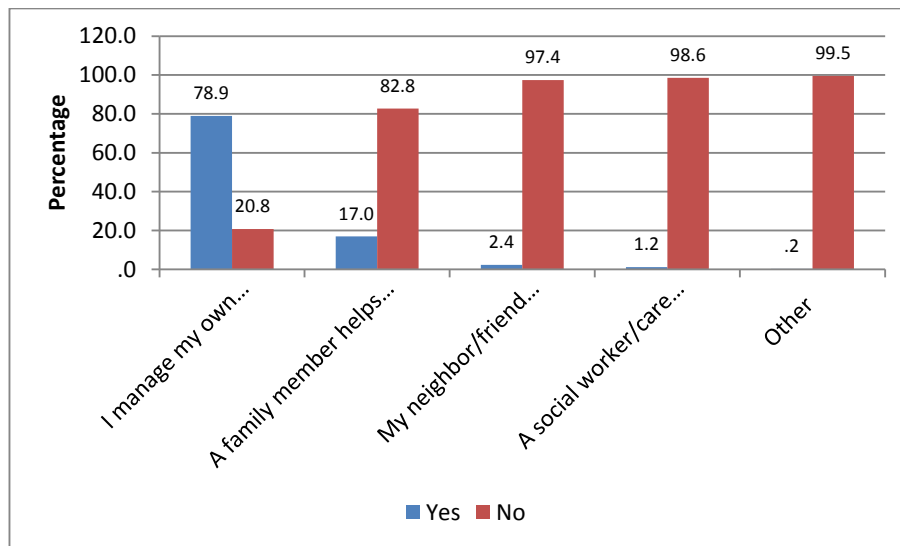


Figure 5.2: Digitally unbanked seniors' financial affairs management

5.3 MISSING DATA AND EXAMINING DATA ENTRY

The data that was collected in the study was captured in an Excel spreadsheet. Prior to the data analysis however, an examination of the data entry was undertaken to gain insights into the precision of the data capturing process and the handling of missing cases. Captured data represents raw facts in research and it is important to manage the precision in which it was inputted, especially given that the manual capturing of data is prone to human error (Hamzah, Yatin, Ismail & Ghazil, 2018). The first process involved the manual screening of each individual case on the Excel spreadsheet to identify glaringly obvious data capture errors, such as typing mistakes.

The second screening process involved composing descriptive statistic frequencies, mean and standard deviations. These data quality screening processes revealed a total of 28 data entry error cases (subject number: 30, 33, 34, 35, 36, 41, 56, 57, 58, 59, 64, 67, 68, 72, 79, 84, 87, 95, 98, 126, 132, 150, 163, 194, 234, 242, 404 and 409).

To effect corrective measures, the hard copies of the questionnaires were revisited to manually moderate the value errors. The evaluation of the questionnaires for the data error cases also revealed that three questionnaires (for subjects 59, 64 and 79) needed to be excluded from the analysis, because the data collectors did not complete any sections of the questionnaire after Part A (demographics section). This then left the study with 418 subjects who were included in the analysis.

5.4 STRUCTURAL EQUATION MODELING

In the present section (section 5.4) an overview of the SEM technique that was applied in the present study is provided, together with an explanation of the use of SEM to validate the study's measurement model and to test the causal relationships between the constructs and associated hypotheses. Therefore, the following section provides a description of the nature and objectives of SEM, including the advantages of this technique over other techniques.

CFA is also described in this section jointly with the CFA conducted in the study's model. Additionally, in the discussions of the CFA, the reliability and validity of the measurement model was confirmed. Furthermore, the outcomes, modifications and estimations of path analysis together with the outcomes of the SEM are tabled (below).

The basic approach of performing an SEM analysis involves the following steps, according to McQuitty and Wolf (2013:62-63):

- (i) Specify a conceptual model that typically uses diagrams to summarise the proposed relationships between constructs “based on theory” derived from literature and ideas regarding extension to existing models
- (ii) Determine how to measure the constructs
- (iii) Collect data
- (iv) Input the data into the SEM software package
- (v) Software fits the data to the specified model and produces the results, which include overall model fit statistics and parameter estimates.

Wang, Hefetz and Liberman (2017) reiterates these five steps as the basic steps of applying SEM cited in literature.

5.4.1 The Use of Structural Equation Modelling (SEM)

The use of SEM is steadily increasing in social sciences research and the technique has now become the most favoured in the field (Shaheen et al. 2017). There are three types of use of SEM that are identified. SEM is used commonly in literature for measurement models, structural models and a form combining both measurement and structural models (Wang et al. 2017; Hooper, Coughan & Mullen 2008). The present study assumes the use

of SEM in line with the third type that incorporates both the measurement and structural model testing. SEM is applied with AMOS for the purposes of this study.

SEM is a general framework for statistical analysis that involves some constructs, such as beliefs, that are latent and cannot be directly observed or measured (Wang et al. 2017). According to Shaheen et al. (2017), the earlier development of SEM models was thanks to Karl Jörksog, Ward Kiesling, David Wisely and it was originally known as the JKW model, later called the Linear Structural Relations model.

The basic SEM model consists of two sub-models, the measurement model and the structural model. The purpose of the SEM model is to explain why variables are correlated in a particular manner (McQuitty & Wolf, 2013). The SEM approach starts with model specification (Wang et al. 2017).

The present study deployed the SEM analysis with latent variables. Latent variables (also known as constructs) are theoretical factors that are assumed to underlie one or more directly observed variables, and cannot be directly seen themselves (Jeon, 2015). In this study, there were ten latent variables: 1) Customer involvement, 2) Bank initiative, 3) Design, 4) PEOU, 5) PU, 6) Privacy and security, 7) Trust, 8) Costs, 9) Attitude, 10) Willingness to use.

In order to test the accuracy of the conceptual model, a two-stage process comprising the measurement model and the structural model is commonly applied in many SEM studies (Civelek, 2018). The two-stage process was also followed in this study, focusing on a theoretical model for e-banking digitally unbanked seniors. Anderson and Gerbing (1998) advocates for the use of the two-stage approach applied in this study, because it provides a particularly useful framework for formal comparisons of the substantive model of interest with the next most likely theoretical alternatives.

In the first stage, the measurement model is tested and in the second stage, the structural model is tested (Civelek, 2018). However, discussions on the criteria for model specification (5.4.2) as well-fit indices (5.4.3) precede the two-stage process of model testing that was undertaken in the present study.

5.4.2 Criteria for model specification

Existing literature, as well as other information sources and theories, form the basis for a researcher's model specification, since this is basically one's expression of their beliefs about the causal relationships and their outcomes (McQuitty & Wolf, 2013). The hypothesised conceptual model in the present study has been specified on the basis of e-banking theories in the extent literature, as well as ideas regarding extensions to existing models.

In particular, the model is premised on the TAM (including ideas regarding its extension) and Baroudi et al.'s (1986) theory of users' involvement in system design. The model is specified with ten latent constructs, each with a set of measure items on a 5-point Likert scale, as well as hypothesised relationships. The measurement instrument applied statements relating to each of the ten latent constructs on a 5-point Likert scale reflecting favourable ("strongly agree") or unfavourable ("strongly disagree") on each end point.

The data that was collected in the present study was analysed during a two-stage process. This data analysis process first considered, according to recommendations by Chen, Chen and Lee (2018), the measurement model, which specifies the relationships between the latent constructs and the observed measures, overall model fit, data reliability, convergent validity and discriminant validity via CFA to ensure that the model accurately reflects the study's constructs.

Secondly, data was analysed according to Chen et al. (2018), by means of testing the structural model, which reflected the relationships between latent constructs measurement variables to determine overall model fit, path coefficient significance (or hypotheses testing) and explanatory power.

As per Schrieber et al. (2006), fit statistics were evaluated throughout this process, to see if the proposed model fits the data or not. The section below provides the fit indices applied in the present study.

5.4.3 Fit Indices

SEM has no single statistical test that best describes the strength of a model's prediction (Chen et al. 2018). According to Shadfar and Malekmohammadi (2013), researchers have devised a number of measures, fit indices, which are used in combination as statistical

tests to assess the SEM results (Shadfar & Malekmohammadi, 2013). Fit indices can be absolute fit indices, incremental or composite fit indices, or indices of model parsimony (McQuitty & Wolf, 2013). Chen et al. (2018) recommend that, as a basic minimum, researchers should use common fit indices for reporting.

For the purposes of this study, the following common fit indices were used, as per Intana and Chansa-ngavej (2014) to evaluate the model fit:

- Chi-square/DF
- Comparative Fit Index (CFI)
- IFI
- Root Mean Square Error Approximation (RMSEA)

The Chi-square/DF is the traditional value for evaluating model fit. This index falls into the category of absolute indices in SEM. The Chi-square does not use the alternative model as a basis for comparison (Chen et al. 2018).

The Chi-square is however affected by sample size (i.e. it lacks power with low sample sizes whereas large sample sizes are more likely to produce significant Chi-square, therefore resulting in models where large sample sizes are used being rejected), model size (larger models usually produce large Chi-square) and highly skewed variables (result in high Chi-square). The Chi-square requirement is: <5.

CMIN/DF is also referred to as the relative Chi-square. A value of between 2 and 5 is acceptable.

CFI, or Bentler's CFI is within the non-centrality-based indices. The CFI considers sample size and retains its power even when the sample is low (Chen et al. 2018). The CFI assumes that all latent variables are uncorrelated and compares the sample covariance matrix with these uncorrelated latent variables (Hopper et al. 2008). The formula for the CFI is:

$$\frac{d(\text{Null Model}) - d(\text{Proposed Model})}{d(\text{Null Model})}$$

The CFI has been normed (guaranteed) that its values cannot be below 0 or above 1. The CFI requirement is: $\geq .95$ since anything closer to 1 is considered a very good fit.

Bollen's IFI falls into the category of relative fit indices, because it compares the model's Chi-square with that of the independent model. The IFI is also relatively unaffected by sample size (Shadfar & Malekmohammadi, 2013). The IFI requirement is: $\geq .9$ (Shadfar & Malekmohammadi, 2013).

The RMSEA is the degree of falseness of the null hypothesis. It is essentially the square root of the difference between the residuals of the sample covariance matrix and the hypothesised covariance model (Hopper et al. 2008). The formula for the RMSEA is:

$$\frac{\sqrt{(\chi^2 - df)}}{\sqrt{[df(N - 1)]}}$$

The RMSEA is the most popular measure for model fit in SEM studies. Its requirement is: $< .08$ and values closer to zero represent a good fit (Chen et al. 2018).

Table 5.3 presents the fit indices reported in the present study and the requirement for each.

Table 5.3: Fit Indices Reported in the Present Study

Fit Indices	Requirement
CFI	$\geq .95$
IFI	$\geq .9$
RMSEA	$< .08$
CMIN/DF	< 5

5.5 RESULTS OF THE SEM ANALYSIS

The previous section provided an overview of the SEM and its application in the study. This section presents the results of the statistical analysis of the collected data. The CFA results are presented first. Thereafter, the presentation of the results of the measurement model, including all the constructs follows. Then, that discussion is followed by the results of the SEM to test for hypotheses.

5.5.1 Confirmatory Factor Analysis Results

The first component of an SEM is the testing of the measurement model conducted using CFA (Schrieber et al. 2006). CFA is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs (Schumacher & Lomax, 2010).

According to Chen et al. (2018), CFA is also a tool that is used to confirm or reject the measurement theory, testing the reliability of the constructs and evaluating factor invariance across time and groups. The primary rationale for CFA is to seek to statistically test the significance of the hypothesised factor model, thereby assessing whether the sample data confirms the model (Schumacher & Lomax, 2010).

Prior to CFA testing of the measurement properties of the full measurement model in the present study, a CFA was conducted on each of the individual constructs (for example, Customer involvement, Bank initiative, Design, PEOU, Trust etc.) to check the reliability and validity of the indicators. Fit indices were utilised to verify fit. Where fit was found to be unacceptable, the modification indices and residuals were examined, and re-specifications of the constructs were made to increase model fit by deleting items that had large residuals (and/or those that wanted to load to another construct). The results of the present study's individual constructs' CFA follow below.

5.5.1.1 Initial Findings (CFA): Customer Involvement

The five items that were used to measure the customer involvement factor were subjected to CFA. Item 1, which dealt with the digitally unbanked seniors' personal involved in e-banking creation before it is developed had a standardised loading of .907, item 2, which dealt with digitally unbanked seniors' input into the system development (.906), item 3 (the contribution of digitally unbanked seniors about their specific requirements) was .762, item 4 ('if I was able to make it suitable for my needs') was .516, and the loading for item 5 dealing with being part of the process of development was .650. The standardised loadings for each of the items and the achieved fit indices are reflected in Table 5.4 below. Table 5.4 also presents the achieved fit indices.

Since the initial achieved fit indices indicated that the fit was poor, upon examination of standardised loadings and MIs, item 4 (CustInv4) was removed in order to improve fit, as it had a low loading (.516) in comparison to the other four items. According to Hooper

et al. (2008), the removal of weak items is unlikely to affect the theory behind a factor. The removal of item 4 does not appear to negatively affect the theory behind the factor, because item 4 is concerned mainly with digitally unbanked seniors' involvement in the system process at the level of customisation to the individual needs, while the other four retained measured involvement in e-banking creation.

The adjusted fit indices values achieved, CMIN/DF 2.746 (requirement: <.5), RMSEA .066 (requirement: <.08), IFI .996 (requirement: ≥.9) and CFI .996 (requirement: ≥.95) all demonstrated a good fit. The normed Chi-square (CMIN/DF) illustrates a good fit (2.746) as it is within the acceptable value of between 2 and 5. The construct composite reliability for this factor is .882, which is acceptable according to Fornell and Bookstein (1982). The required construct reliability is >.7.

Table 5.4: Summary of Initial Findings (CFA): Customer Involvement

Question. Item	Item wording	Initial Standardized Loadings	Final Standardized Loadings	
CustInv1	The bank involved me in its creation before it is developed	.907	.905	
CustInv2	I was able to have input into the system development regarding the required banking steps	.906	.922	
CustInv3	I was able to share my insights about my specific needs and wants in the banking process	.762	.743	
CustInv4	I was able to make it suitable to my needs	.516		
CustInv5	I was part of the process of developing it	.650	.641	
Achieved Fit Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	24.508	.242	.900	.900
Final	2.746	.066	.996	.996
Composite Construct Reliability .882				

5.5.1.2 Initial Findings (CFA): Bank Initiative

Bank initiative was measured with five items. All the five items were subjected to CFA and the results are presented in Table 5.5 below.

Table 5.5: Summary of Initial Findings (CFA): Bank Initiative

Quest. Items	Item wording	Initial Standardized Loadings	Final Standardized Loadings	
BankIn1	The banks created awareness about its existence	.799	.862	
BankIn2	The banks went out of their way to work on promoting its benefits to people like me	.826	.910	
BankIn3	The banks convinced me that e-banking was better	.919		
BankIn4	The banks provided me training on how to use it	.871	.807	
BankIn5	The banks made available someone that I could contact on how to use it	.786		
Achieved Fit Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	21.584	.222	.945	.945
Final	-	.000	1.00	1.00
Composite Construct Reliability .882				

The examination of the standardised loadings and MIs illustrated that there was not one good fit and it was required that the model is adjusted by the removal of item 3 (BankIn3) and item 5 (BankIn5) to improve fit.

The final achieved RMSEA fit of .000 (requirement: <.08), IFI (1.00 – requirement: ≥.9) and CFI (1.00 – requirement - ≥.95) demonstrated that the model is adequately saturated, and there was a good fit. The factor has a composite construct reliability of .882, which is adequate against the requirement of >.7.

5.5.1.3 Initial Findings (CFA): Perceived Ease of Use (PEOU)

The measures of the PEOU factor were all adaptations of the original TAM's (Davis, 1986) four items. The measures were subjected to CFA. The table below presents the initial and final loadings for these measures as well as the achieved fit indices.

Table 5.6: Summary of Initial Findings (CFA): Perceived Ease of Use

Quest. Items	Item wording	Initial Standardized Loadings	Final Standardized Loadings	
PEOU1	It was easy for me to use	.844	.814	
PEOU2	It did not require a lot of effort from me	.830		
PEOU3	It was easy for me to become skilful in using it	.943	.945	
PEOU4	Using it enabled me to manage my money affairs more easily	.916	.934	
Achieved Fit Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	79.947	.443	.899	.899
Final	-	.000	1.00	1.00
Composite Construct Reliability .926				

The initial loading for PEOU1, dealing with the ease-of-use of e-banking was .844, PEOU3 relating to the acquiring of skills to use (.943), PEOU4 (relating to e-banking making the management of use's money affairs more easily) had a loading of .916 and PEOU2 relating to effort required to use had a loading of .830.

The examination of the standardised loadings and MIs illustrated that there was not a good fit and it was required that the model is adjusted by the removal of Item 2 (PEOU2) to improve fit. It is good practice when conducting CFA to assess the fit of each individual factor to identify and remove items that are particularly weak (Hooper et al. 2008).

The final achieved RMSEA fit of .000 (requirement: <.08) demonstrated that the model is adequately saturated, and there was a proper fit as well as perfect fit values for the IFI and CFI (all at 1.00 against the requirements of $\geq .9$ and $\geq .095$, respectfully). An RMSEA closer to zero demonstrates a good fit (Hooper et al. 2008) and IFI as well as CFI values of 1 illustrates a good fit as well (Shadfar & Malekmohammadi, 2013). The composite construct reliability for this factor is .926, which is beyond adequate (the requirement is >.7).

5.5.1.4 Initial Findings (CFA): Design

Design in the proposed model of the study was measured by six items. Item 1 (Design1) pertained to design that ensures information accessibility, Design2 dealt with information display and readability and Design3 related to information being understandable. Design4 and Design5 dealt with the functional nature of the design (quickness of the steps followed using, as well as the simplicity aspects, respectively) and Design6 dealt with the features of the e-banking interface. All the items were subjected to CFA and the results are summarised in Table 5.7 below.

Table 5.7: Summary of Initial Findings (CFA): Design

Quest. Items	Item wording	Initial Standardized Loadings	Final Standardized Loadings	
Design1	It was designed such that information is easily accessible	.870		
Design2	It was designed such that information is displayed in a readable way	.874	.855	
Design3	It was designed such that information on the system interface is understandable for me	.916	.913	
Design4	It was designed such that the banking steps that I must follow were quick for me to do my banking	.933	.945	
Design5	It was designed such that it was simple for me to do my banking using it	.848	.859	
Design6	It was designed specifically for people like me in terms of its features (e.g. large clear font), as I have different needs to younger people	.870	.863	
Achieved Fit Indices				
	CMIN/DF X ² /DF	RMSEA	IFI	CFI
Initial	8.535	.137	.974	.973
Final	2.455	.060	.996	.996
Composite Construct Reliability .949				

The CFA results indicated that there was poor fit, because the ranges of fit levels for the CMIN/DF - 8.535 (requirement: <.5) and RMSEA - .137 (requirement <.08) were far apart from the recommended scales. The results that demonstrated good fit levels were IFI - .974 ($\geq .9$) and CFI - .973 ($\geq .95$).

The inspection of the regression loadings and MIs indicated that Item 1 should be removed in order to improve model fit. Upon the deletion of Item 1, the model was re-run and this exercise returned improved a model fit with the value of CMIN/DF of 2.455 (requirement: <.5), RMSEA of .060 (requirement <.08) and the IFI increased closer to 1 (.996, from previous fit level of .974 [requirement, \geq .9]), as well as the CFI (.996, from .973 [requirement, \geq .95]). The composite reliability for this 5-item factor is .949, which is more than adequately above the required minimum of .7.

5.5.1.5 Initial Findings (CFA): Trust

Trust was measured using four items. All four items were subjected to CFA and the standardised loadings and the achieved fit indices are summarised in Table 5.8 below.

Table 5.8: Summary Findings (CFA): Trust

Quest. Items	Item wording		Initial Standardised Loadings	Final Standardised Loadings
TRUST1	I could trust it		.886	.815
TRUST2	If I could trust the bank providing it		.920	
TRUST3	If I was given sufficient protection to ensure that I would not fall victim to fraud scams and lose money		.898	.940
TRUST4	If it (e-banking) always provided accurate up to date results		.852	.889
Achieved Fit Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	43.812	.326	.943	.943
Final	-	.000	1.00	1.00
Composite Construct Reliability .913				

The model fit was poor when fit indices were considered, despite the relatively good IFI (.943 against the requirement of \geq .9) and CFI (.943 [requirement, \geq .95]).

The inspection of regression loadings and MIs resulted in the removal of Item 2 (TRUST2) in order to improve model fit. This resulted in improved model fit as the RMSEA was perfect fit (.000 [requirement: <5]) as were the IFI (1.00 [requirement: ≥.95]) and the CFI (1.00 [requirement: ≥.9]). The composite reliability for this factor is .913, which is adequate against the requirement of >.7.

5.5.1.6 Initial Findings (CFA): Privacy and Security

Privacy and security was measured with three items. The correlations of the items demonstrated strong inter-item correlations (all above .50). The items were subjected to CFA and the findings are presented in Table 5.9 below.

Table 5.9: Summary Findings (CFA): Privacy and Security

Quest. Items	Item wording			Standardized Loadings
P&S1	It was sufficiently secure to bank with it			.912
P&S2	The bank providing it had the expertise to ensure that my banking information is kept private			.944
P&S3	My banking behaviour remained confidential			.881
Achieved Fit Indices				
CMIN/DF X ² /DF	RMSEA	IFI	CFI	
-	.000	1.00	1.00	
Composite Construct Reliability .937				

As the findings in the table show, initial CFA findings demonstrated that all the items had sufficient high loading scores and the model fit with the data without any necessary modifications. The model's RMSEA (.000 [requirement: <5]) index demonstrates a perfect fit, as is the IFI (1.00 [requirement: ≥.9]) and CFI (1.00 [requirement: ≥.95]). The composite construct reliability of this factor is also beyond adequate (.937) against the requirement of minimum greater than .7.

5.5.1.7 Initial Findings (CFA): Cost

Three items were used to measure the cost factor in relation to e-banking as composed in the study's model. The items used in the present study to measure cost have been validated in prior research (Mukthar, 2015; Wu & Wang, 2005), therefore there is assurance for their content and face validity as a measure for costs in e-banking adoption.

The inter-item correlation inspection revealed strong correlations between these items (all above .800). The items were subjected to CFA and the Table 5.10 below presents the summarised results. The initial CFA analysis of the cost factor demonstrates that the model was acceptable without any modifications and had a good fit with the data. However, when a measurement model was done with all the retained cost items after the individual construct CFA, the analysis demonstrated that Item 2 (COST2) was a cross loader with PU1 and the items had to be removed to improve model fit. The composite construct reliability of the factor is .895 (adequate against the requirement of $>.7$).

Table 5.10: Summary Findings (CFA): Cost

Quest. Items	Item wording		Standardized Loadings
COST1	If it cost me less to use it compared to traditional 'in the bank' banking		.885
COST2	I was not required to spend money on purchasing/upgrading equipment		.839
COST3	If the bank didn't charge me high fees to use it		.855
Achieved Fit Indices			
CMIN/DF X²/DF	RMSEA	IFI	CFI
-	.000	1.00	1.00
Composite Construct Reliability .895			

5.5.1.8 Initial Findings (CFA): Attitude

Attitude was measured with six items. All the items were subjected to CFA and the summarised results are presented in the table below. The initial model fit was not good as seen in Table 5.11 below. The loadings analysis after initial regression revealed the need to add covariance indicators between Items 1 and 2 to improve model fit. The model was re-run and the results are summarised below. The adjustments, as demonstrated by the achieved fit indices in Table 5.11, shows an improved model fit.

The final CMIN/DF achieved is 2.351 (from the original 8.411 and the requirement is: <5), RMSEA .058 (from the original .136, the requirement is: $<.08$), IFI .995 (closer to 1, from .968 and the requirement is $\geq.9$) and CFI .968 (requirement is: $\geq.95$). The composite construct reliability of this factor is .937, which is acceptable against the requirement of $>.7$.

Table 5.11: Summary Findings (CFA): Attitude

Quest. Items	Item wording	Initial Standardized Loadings	Final Standardized Loadings	
ATTITUD1	I like the idea of using it	.769	.745	
ATTITUD2	I think that using e-banking is a good idea	.812	.791	
ATTITUD3	Using e-banking appeals to me	.907	.908	
ATTITUD4	E-banking could be exciting	.894	.902	
ATTITUD5	E-banking could be advantageous for me	.850	.852	
ATTITUD6	I could enjoy the challenge of e-banking and find it stimulating	.857	.860	
Achieved Fit Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	8.411	.136	.968	.968
Final	2.351	.058	.995	.995
Composite Construct Reliability .937				

5.5.1.9 Initial Findings (CFA): Perceived Usefulness

Table 5.12: Summary Findings (CFA): Perceived Usefulness

Quest. Items	Item wording	Initial Standardized Loadings	Final Standardized Loadings	
PU1	It was useful in my banking	.867	.881	
PU2	It improved my banking experience	.938	.944	
PU3	It helped me complete my banking tasks more quickly	.925		
PU4	It increased the effectiveness of my banking	.848	.825	
Achieved Fir Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	8.629	.138	.990	.990
Final	-	.000	1.00	1.00
Composite Construct Reliability .915				

The Perceived Usefulness (PU) factor was measured with four items. The items were mainly the study's adaptations of items measuring this factor in the original TAM model (Davis, 1986). The items were subjected to CFA and Table 5.12 (above) presents the results.

Initial CFA results indicated that there was poor fit, because the ranges of fit levels were far apart from the recommended thresholds (CMIN/DF - 8.629 [requirement: <5], RMSEA - .138 [requirement: <.08]). The inspection of regression loadings and MIs indicated that Item 3 should be removed in order to improve model fit. Upon the removal of Item 3, the achieved fit indices demonstrated an improved model fit. The composite construct reliability of the factor is .915, which is adequate (requirement: >.7).

5.5.1.10 Initial Findings (CFA): Willingness to Use

The willingness to use factor was measured with five items. The five items were subjected to CFA and the results are presented in the Table 5.13 below.

Table 5.13: Summary Findings (CFA): Willingness to Use

Quest. Item	Item wording		Initial Standardized Loadings	Final Standardized Loadings
WTU1	I am willing to try e-banking		.962	.965
WTU2	I am willing to start using e-banking services in the future		.978	.979
WTU3	I am willing to try e-banking for my basic daily banking needs		.919	.914
WTU4	I am willing to change my present banking behaviour so that I can enjoy the benefits that e-banking offer		.819	.811
WTU5	I am willing to move to e-banking if I am assured of help from the bank		.651	
Achieved Fit Indices				
	CMIN/DF X²/DF	RMSEA	IFI	CFI
Initial	9.705	.147	.981	.981
Final	.010	.000	1.00	1.00
Composite Construct Reliability .955				

Initial standard regression analysis, as viewed from the initial fit indices, demonstrated a poor fit. The inspection of regression loadings and MIs demonstrated that there was a need for covariance indicators between Item 3 and Item 4, which then required that Item 5 be removed. The final achieved fit indices then demonstrated a good fit. CMIN/DF = .010 (requirement: <5), RMSEA = .000 (requirement: <.08), CFI = 1.00 (requirement: \geq .95) and IFI = 1.00 (requirement: \geq .9).

In this section, all the individual measurement models were subjected to CFA and initial statistical analysis. The individual measurement models with the retained items were then combined together into a full measurement model and tested for reliability, validity and fit.

5.5.2 FULL MEASUREMENT MODEL FIT

The next step in the analysis was the CFA undertaken to confirm the measurement scale properties of the full measurement model containing all the factors, which ensued immediately after the CFA that was conducted for the individual constructs in the previous section. The measurement model depicts the pattern of observed variables for those latent constructs in the hypothesised model (Civelek, 2018). The study also used the measurement model to examine the extent of the inter-relationships and covariance among latent variables.

5.5.2.1 Full Measurement Model Fit to the Data

The initial measurement model contained the original 45 measure items. The CFA of the initial full measurement model testing did not produce a good fit as the results were mixed. While the model's Chi-square/DF was calculated as adequate (3.853, requirement <5), the CFI was computed as too low (.867, requirement \geq .95). The IFI was also computed as low (.868) against the required threshold of \geq .9. In addition, the model's RMSEA was found to be too high (.084) as against the rule of thumb reasonable error approximation of between .05 and .08. This then meant that the model required modification to improve its fit.

5.5.2.2 Initial Full Measurement Model Revision

In order to improve the fit of the Initial Full Measurement Model, some covariances were added to error terms of measured items. Indications were to remove some items from the

45 items of the initial full measurement model to attain minimum fit indices requirements. A total of eight items affecting seven factors were removed from the model (CUSTINV5, BANKIN, 3 &5, PEOU2, DESIGN1, TRUST2, WTU5, PU3). These fit improvement modifications resulted in the full measurement model remaining with a total of 37 items, as seen in Table 5.13.

The 37-item model was re-run and the following were the results: CMIN/DF - 2.175 (required: <5); CFI - .935 (required: $\geq .95$); IFI - .935 (required: $\geq .9$), RMSEA - .064 ($< .08$). Accordingly, the model fit was still not satisfactory. In addition to this, minimum standards/conditions of validity and reliability of the measurement model were required to be attained.

The model (37 item model) was re-run and the following were the results: CMIN/DF - 2.175 (required: <5); CFI - .935 (required: $\geq .95$); IFI - .935 (required: $\geq .9$), RMSEA - .064 ($< .08$). Accordingly, the model fit was not satisfactory. In addition to this, minimum standards/conditions of validity and reliability of the measurement model were required to be attained.

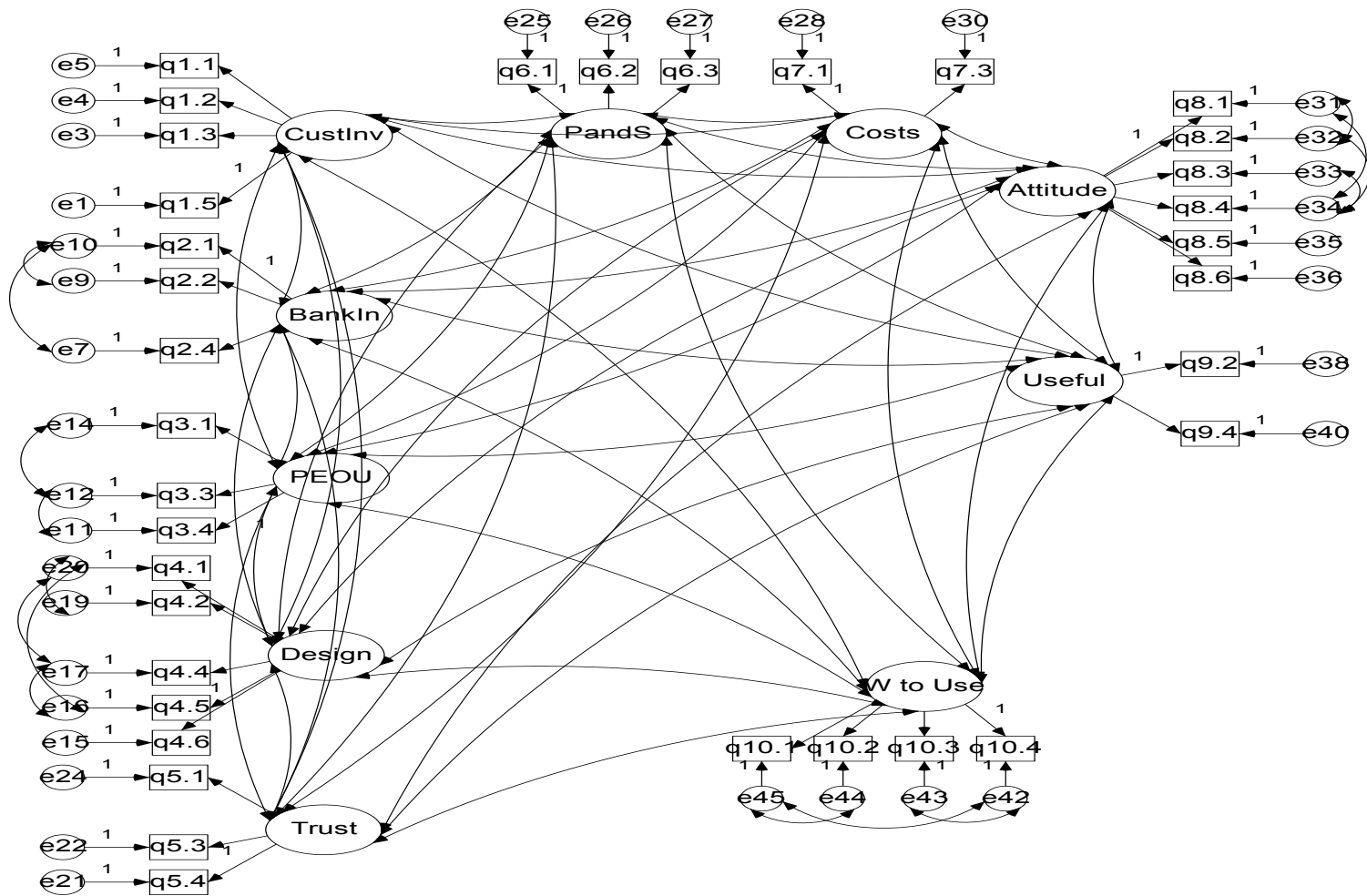


Figure 5.3: Study's Measurement Model (37 Item Model derived from SEM results)

5.5.2.3 Second Revision of the Measurement Model

The inspection of regression loadings and MIs of the revised full measurement model, for the purpose of improving model fit, as well as validity and reliability, resulted in the dropping of a further two items that were identified as cross loaders. The dropped items affected two factors, PU (PU1) and Cost (COST2). This modification meant that only 35 items were retained in the full measurement model.

The modified full measurement model (with 35 items) was re-run and the results demonstrated that a good fit was attained. Table 5.14 presents the attained fit indices.

Table 5.14: Summary of overall (Initial and Final) measurement model (35 items).

Fit Indices	Measurement Model		
	Requirement	Initial Model (45 Items)	Final Model (35 Items)
Min/df	<5	3.853	2.280
CFI	≥.95	.867	.951
IFI	≥.9	.868	.951
RMSEA	<.08	.084	.056

Intana and Chansa-ngavej (2014:130) state the following basic values of goodness of fit indices:

1. Chi-square/DF is also known as the likelihood ratio chi-square, or generalised likelihood ratio, must be between 1.0 and 3.0 – the Chi-square/DF of the present study’s final measurement model is 2.280, therefore demonstrating a good fit.
2. RMSEA is the degree of falseness of the null hypothesis. A rule of thumb is that RMSEA of between .05 and .08 suggests reasonable error approximation – the RMSEA of the present study’s final measurement model is .056, which demonstrates a good fit.
3. CFI assesses the relative improvement of fit of the researcher’s model compared to the baseline model. A rule of thumb is that the value is greater than ≥.95 – the CFI of the study’s final measurement model is .951, therefore demonstrating a good fit.

4. IFI requirement is that the value should be greater than $\geq .90$. The IFI of the present study's final measurement model is .951, demonstrating a good fit.

Therefore, it can be concluded that the study's model fits well and represents a close approximation with the population.

The results of the test for the model's reliability and validity are presented next.

5.5.2.4 Testing for Reliability and Validity

CFA was performed to calculate the final measurement of the model's validity and reliability. The table below presents the results.

5.5.2.4.1 Construct Reliability

Construct Reliability measures whether a set of items measuring a construct are consistent in their measurement. Reliability is computed as follows (Hair, Anderson, Tatham & Black, 1998):

(sum of standard loadings)² / [(sum of standardized loadings)² + sum of indicator measurement error].

The rule of thumb for construct reliability is that it should be $> .06$ or higher, ideally $> .07$ to mean that reliability is good with internal consistency (Fornell & Bookstein, 1982). The results presented in Table 5.15 demonstrate that all the constructs are $> .07$ which indicates that the construct reliability of the final measurement model was attained for all the constructs. The estimated loadings, which reflect the validity of each observed variable as a measure of the latent variable, are all high ($> .5$), which held true for all the factors.

5.5.2.4.2 Convergent Validity

Convergent validity denotes overlaps between alternative measures that are intended to measure the same construct, which should share a good deal of variance (should converge together). In line with recommendations by Hair et al. (2006), convergent validity was assessed by means of the following:

- Factor Loadings (regression weights in Amos)
- Reliability
- Average Variance Extracted (AVE)

Hair et al. (2006) recommends that Factor Loadings should be $>.05$ (ideally $>.07$) and at a minimum statistical significance. As seen in Table 5.15, Factor Loadings are $>.05$ for all factors. In relation to reliability, Hair et al. (2006) recommends that a value of $>.07$ should be attained.

The results in Table 5.15 indicate that all the constructs are $>.07$, which demonstrates that construct reliability of the final measurement model was attained for all the factors (as reported prior). In terms of AVE, Hair et al. (2006) recommends that the value of $.05$ or higher be attained. Table 5.15 indicates that all the constructs are $>.07$, which indicates that construct reliability of the final measurement model is attained for all the factors (as reported previously).

In terms of AVE, Hair et al. (2006) recommends the value of $.05$ or higher, which is said to indicate convergence and that the scale higher has distinct validity. As can be noted in Table 5.15, AVE equals $>.5$ holds for all factors. In addition, Construct Reliability is greater than AVE ($CR > AVE$) for all the constructs, therefore convergent reliability was attained for all the measurement model's constructs.

5.5.2.4.3 Discriminant Validity

Discriminant validity essentially addresses the concept that the items used to measure the different constructs in the model should yield different results (Hair et al. 2006). Therefore, the overlaps between alternative measurements that are intended to measure the same construct should also not be too large. A too large overlap of the measures could indicate the violation of discriminant validity.

The other recommended approach for discriminant validity is to compare the squared correlation between two constructs with either of their AVE estimates (Hair et al. 1998). For discriminant validity, the AVE estimates should be greater than the squared correlation estimates.

The values in Table 5.15 below demonstrates that $AVE > MSV$ holds for all constructs. In addition, discriminant validity is concerned with cross-loaders in that the presence of cross-loaders is an indication of discriminant validity challenges. $AVE > ASV$ holds for all, therefore, discriminant validity was achieved.

Table 5.15: Standardized regression weights

	Estimate	AVE	CR	MSV	ASV
q1.5 <--- CustInv	.641	.658	.883	.180	.047
q1.3 <--- CustInv	.743				
q1.2 <--- CustInv	.922				
q1.1 <--- CustInv	.905				
q2.4 <--- BankIn	.807	.740	.895	.419	.201
q2.2 <--- BankIn	.910				
q2.1 <--- BankIn	.862				
q3.4 <--- PEOU	.934	.733	.892	.419	.186
q3.3 <--- PEOU	.945				
q3.1 <--- PEOU	.814				
q4.6 <--- Design	.863	.788	.949	.252	.167
q4.5 <--- Design	.859				
q4.4 <--- Design	.945				
q4.2 <--- Design	.855				
q4.3 <--- Design	.913				
q5.4 <--- Trust	.889	.779	.914	.178	.107
q5.3 <--- Trust	.940				
q5.1 <--- Trust	.815				
q6.1 <--- PandS	.915	.833	.937	.228	.132
q6.2 <--- PandS	.942				
q6.3 <--- PandS	.879				
q7.1 <--- Costs	.890	.756	.861	.304	.156
q7.3 <--- Costs	.855				
q8.1 <--- Attitude	.752	.719	.939	.627	.135
q8.2 <--- Attitude	.798				
q8.3 <--- Attitude	.907				
q8.4 <--- Attitude	.896				
q8.5 <--- Attitude	.854				
q8.6 <--- Attitude	.861				
q9.2 <--- Useful	.930	.781	.877	.373	.198
q9.4 <--- Useful	.829				
q10.4 <--- W to Use	.811	.842	.955	.627	.125
q10.3 <--- W to Use	.914				
q10.2 <--- W to Use	.979				
q10.1 <--- W to Use	.965				

In conclusion, the results of the revised final measurement model (with 35 items) confirmed the model's fit with the data and its reliability was confirmed, meaning that the model is admissible. Therefore, the results from the CFA supported the further use of

the final measurement model as part of a larger SEM model, hypothesising causal links among latent variables.

5.5.3 STRUCTURAL MODEL

Since the measurement model with confirmed reliability and validity was conformed through CFA, the measurement model was converted into a structural model showing causal relationships between the constructs. The hypothesised structural model was analysed using the SEM technique. The below figure presents the study's structural model.

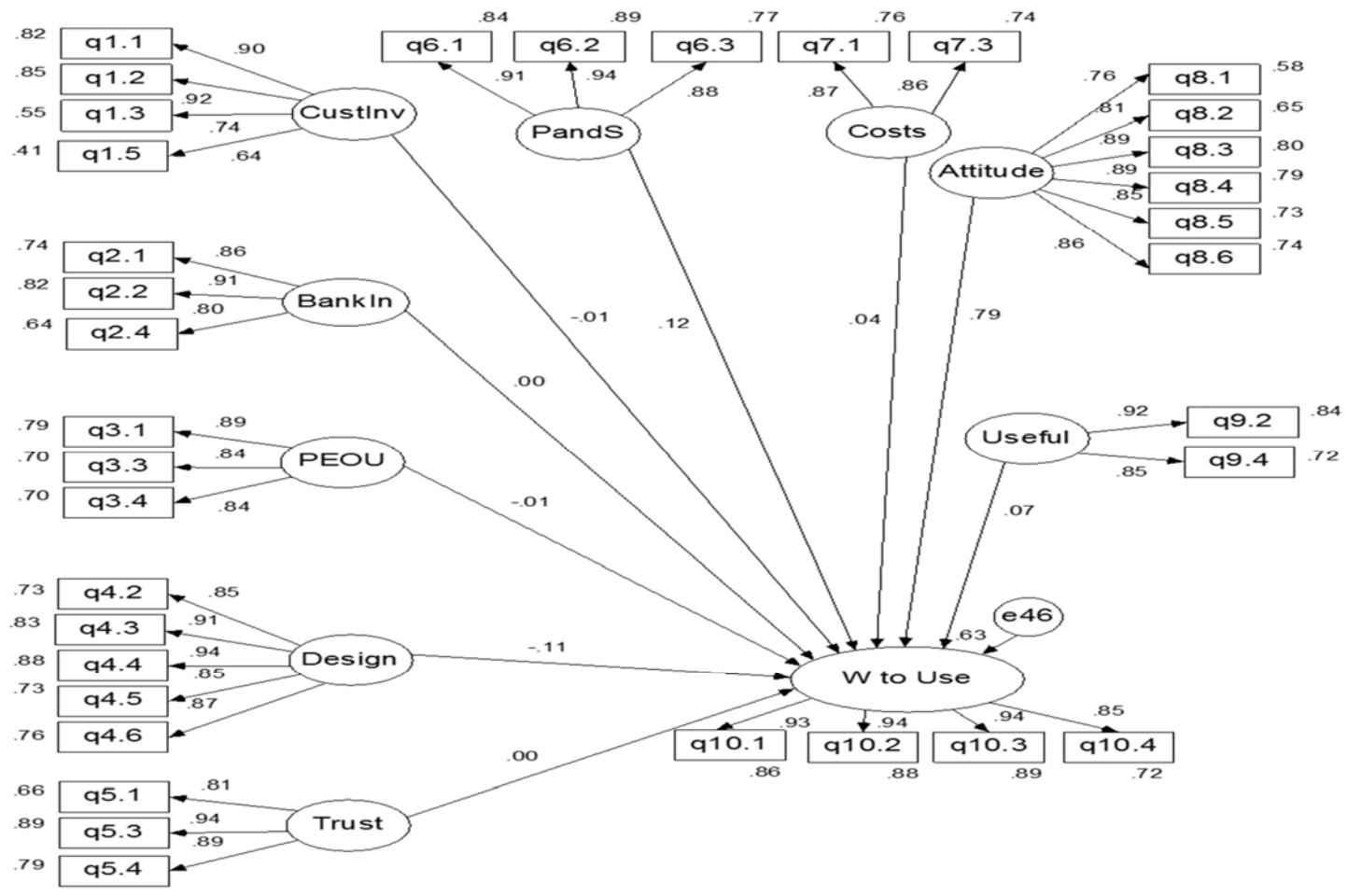


Figure 5.4: Structural model showing causal relationships derived from the researcher's own data.

5.5.3.1 Structural Model Fit to the Data

The structural model demonstrates an overall good fit with the data and represents a close approximation with the population. The model fit indices are presented in Table 5.16 below. The model's Chi-square/DF (2.280, against the requirement of between 1.0 and 3.0) indicates a good fit. The rule of thumb requires that the RMSEA be between .05 and .08 and the structural model's achieved RMSEA was .056, which illustrates a good fit. The model's CFI ($\geq .951$) is also a good fit against the requirement of $\geq .95$. The IFI requirement is that the value should be $\geq .90$ and the structural model's IFI (.951) demonstrates a good fit.

Table 5.16: Structural model fit with data.

Fit Indices	Structural Model	
	Requirement	Structural model fit
Min/df	<5	2.280
CFI	$\geq .95$.951
IFI	$\geq .9$.951
RMSEA	<.08	.056

The estimated standardised path coefficients of the structural model are presented in the table below. In summary, not all the hypothesised paths in the model were significant at a 0.05 probability level. As shown in the table below, the following estimated standardised paths were statistically significant: the estimated standardised path coefficients for the path from "Design" to "Willingness to Use" was $-.114$ ($p < 0.01$). The estimated standardised path coefficients for the path from "Privacy and Security" to "Willingness to Use" was $.120$ ($p < 0.01$). The estimated standardised path coefficients for the path from "Attitude" to "Willingness to Use" was $.789$ ($p < 0.01$).

The estimated standardised paths from "Trust" to "Willingness to Use" (.005), from "PEOU" to "Willingness to Use" ($-.014$), from "Bank Initiative" to "Willingness to Use" (.001), from "Customer Involvement" to "Willingness to Use" ($-.012$), from "Cost" to "Willingness to Use" (.040) and from "PU" to "Willing to Use" (.065) were not found to be statistically significant.

Table 5.17: Estimated standard coefficients of the structural model.

Estimated Path	Est. St Coeffs
W to Use <--- Trust	.005
W to Use <--- Design	-.114
W to Use <--- PEOU	-.014
W to Use <--- BankIn	.001
W to Use <--- CustInv	-.012
W to Use <--- PandS	.120
W to Use <--- Costs	.040
W to Use <--- Attitude	.789
W to Use <--- Useful	.065

The model's significant paths are presented in the Figure 5.5 below (with the red lines indicating significant paths). As can be seen from the diagram, the paths from "Attitude" to "Willingness to Use", from "Privacy and Security" to "Willingness to Use" and from "Design" to "Willingness to Use" are all significant.

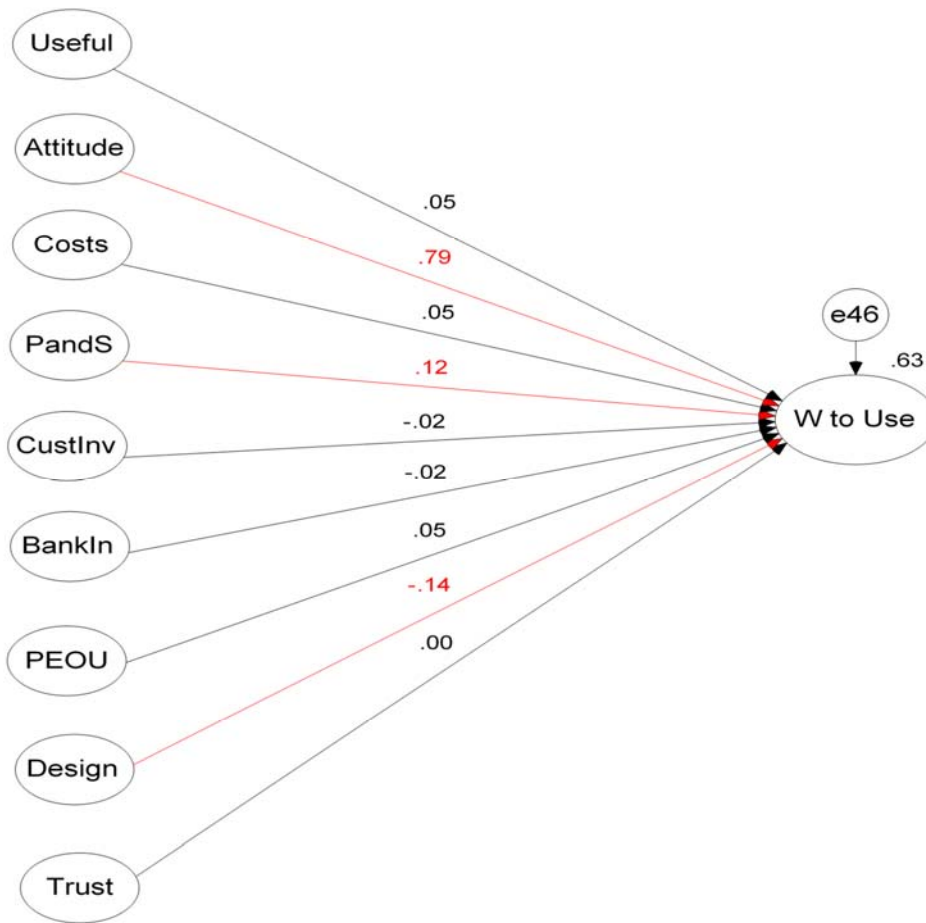


Figure 5.5: Model's Significant Estimated Standardized Significant Paths (*Red line = significant)

5.5.4 DISCUSSION OF THE RESULTS FINDINGS

This section discusses the study's results and the possible reasons for the findings in line with the reviewed literature. The results findings are discussed clustered under the individual relevant research question. Thereafter, a table presenting the study's hypotheses testing is provided. The demographics of the study's participants were presented in the previous chapter and summarised in section 5.2 to afford the reader a view of their characteristics.

5.5.4.1 *What is the effect of involving digitally unbanked seniors in the system development cycle on their willingness to use e-banking?*

Customers are no longer passive bystanders, but active co-creators and co-producers who consciously engage in behaviours that strengthen their relationship with a particular service or product. The present study's findings, when considering the descriptive statistics, indicate overall agreement among digitally unbaked seniors that involving them in the e-banking SDL would have a positive effect on their willingness to use these services.

The findings support prior research relating to involving customers in co-creating value as a means of satisfying personal demands and gaining competitive edge. Fernandes and Remelhe (2016) observe that customers actually become co-creators of value voluntarily and involving them positively affects their association with the service.

He and Yan (2013) found that consumer brands, such as Domino Pizza, have been able to create customer value and customisation from, for example, allowing customers to co-create their own pizzas online prior to ordering. Basil and Weistroffer (2011) in their research findings on user's co-creation involvement conclude that further stages must be added to the traditional SDLCs so as to elicit user's acceptance determinants as that will ensure post-development usage and adoption.

Additionally, the study's findings demonstrate significant agreement among digitally unbanked seniors that there would be a positive effect on their willingness to use e-banking if the banks involved them in the processes prior to the system being developed ($p < .0005$). Therefore, the present study's findings demonstrate that involving digitally unbanked seniors during the ideation phase of e-banking will have a positive effect on their willingness to use these services.

The findings align with literature findings that demonstrate that today's consumers are empowered by advances, such as technology to actively find products and services that are compatible with their requirements (Soltani, Jandaghi & Shahraki, 2017). As a result, involving customers prior to the creation of the services would give the businesses an advantage, as that would help in meeting customers at their point of need. For example, Vittelri et al.'s (2016) findings demonstrate that when the banks involve customers in the conception of a system, they deepen their own customers' understanding and the outcome is an improved alignment between the ICT system, the customers and the bank.

Kumar et al. (2013) found that the banks should seek to stretch the bounds of whichever SDLC model they opt for in e-banking implementation to warrant more customer involvement in the creation of the output as a customer attraction measure. He and Yan (2013) noted that customer value co-creation can be attained in various forms, including virtual forms of co-creation.

The study's population, digitally unbanked seniors, are traditionally financially excluded and the findings demonstrate that the majority (56.2%) agree that they will use e-banking if they are able to give input into the system design. Inputting into the e-banking system design include giving information on issues, such as banking steps and sharing insights on their individual needs and wants, which then impacts the usability of the system from their personal perspectives. These findings support earlier research on this aspect, which essentially pertains to customisation.

Customisation is a direct productivity gain of involving customers (Tereblanche, 2014). During their study in India, Mishra and Bisht (2013) found that when end-users gave input into the e-banking design, then sustainable e-banking services were achieved for financial inclusion purposes. The findings of Isaias and Issa (2015) demonstrate that usability is very central to the adoption of the system. Consequently, users should be included in the entirety of the SDL.

The reason for the co-creation approach is that the user is able to provide their insights with regards to the system's usability during its development. When users contribute to the system, they are essentially determining the system's characteristics to meet their own needs. A technology system that meets users' needs has a positive effect on their attitude towards it (Ahmed et al. 2017).

Damkuviene, Dijunaitiene, Petukiene and Bersenaite (2012) found that before participating in co-creation, the user is considering all the factors that are important to him and makes a trade-off between perceived costs and perceived benefits. In this way, their input stemming from this thought process ensures that the system is usable according to their own specific requirements.

Summarily, the study's findings demonstrate the following as having an effect on the users' willingness to use e-banking when involving digitally unbanked seniors in the system's co-creating in the SDLC: seniors become willing to use e-banking; customer-centric e-banking services are developed; the e-banking services that are developed are compatible to users in terms of steps in completing tasks and the e-banking services that are developed become customised to the needs and wants of digitally unbanked seniors. Finally, involving digitally unbanked seniors in e-banking co-creation can impact financial inclusion positively as this population demonstrates willingness to use e-banking if they are involved in creating it.

5.5.4.2 *What are South Africa's digitally unbanked seniors' design requirements of the banks' e-banking system?*

The present study's findings indicate that the system design of e-banking is an important determinant of digitally unbanked seniors' willingness to use the services. The system design factor essentially encompasses the components of the system characteristics, which literature, for example, Ahmed et al. (2017) have found to be important to users' attitude towards the system. The findings indicate significant results that it is a system design requirement of the digitally unbanked seniors that the information of the e-banking system is easily accessible ($p < .0005$).

Of the study's respondents, 93% strongly agree with the information accessibility aspect and the findings are consistent with previous research regarding the effect of system design on willingness to use e-banking (Masouda & Taqa, 2017; Goudarzi et al., 2013). Figure 5.6 illustrates the study's descriptive findings on design.

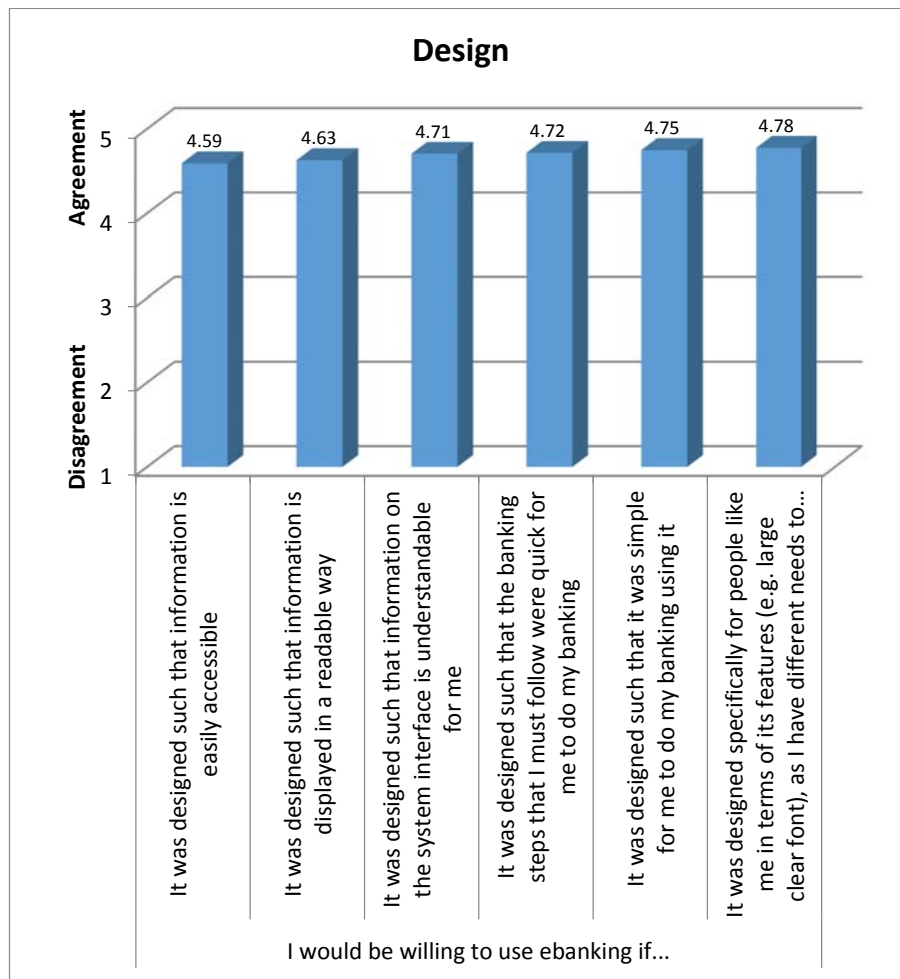


Figure 5.6: Design factor

These findings highlight the need for banks to focus on the design of e-banking. It is a requirement of adoption that the customer interface platforms of e-banking systems are designed in a way that ensures that information is accessible to digitally unbanked seniors.

Ling, Fern, Boon and Huat (2016)'s findings demonstrate that website design and content were among the top customer satisfaction factors with regards to e-banking, therefore affecting the use of these services. Therefore, if the information of the e-banking interface is accessible to digitally unbanked seniors, they will be willing to use it (Ling et al. 2016).

The current study's findings also demonstrate statistical significance ($p < .0005$) that digitally unbanked seniors require that the information on the e-banking customer interface systems is displayed in a readable way, as that will have a positive effect on their willingness to use these services. The findings of Olphert (2013) demonstrate that seniors have specific technology requirements, because as people age, they experience challenges, such as loss of the quality of their sight. Therefore, the e-banking system should be compatible with these users' specific circumstances.

Compatibility denotes the degree to which the design of the system can stick with the existing set of values and needs of the users. Therefore, it is required as a result of the needs of seniors that e-banking platforms are designed in such a way that information is displayed in a readable way for it to be usable given their special circumstances (Olphert, 2013). The findings in the current study that indicate that it is a system compatibility requirement of the digitally unbanked seniors that information on the e-banking system is displayed in a readable way, therefore supports existing literature (Gopal & Murale, 2018)

In addition, the study's findings demonstrate that it is a statistically significant ($p < .0005$) design requirement of digitally unbanked seniors impacting their willingness to use e-banking that the information displayed on the system is readable. The readability of the information relates to issues, such as the language used, the size of the letters and the quality of the content in relation to the banking tasks that are being undertaken.

Therefore, similar to prior research findings, the quality of the information has to be of high standard to ensure that it is easy to decode. For example, the findings of Punyani (2015) were that information quality and interaction quality have an effect on e-banking users' perceptions in relation to their understanding of the system and the required tasks.

The study's findings also demonstrate that a further statistically significant ($p < .0005$) design requirement of digitally unbanked seniors is that e-banking should be easy-to-use and the steps are quick. These findings are supported by prior research. Gatsou, Politis and Zevgolios (2017) conducted a seniors' user experience of two online banking sites and their findings were that most seniors were interested in learning e-banking, but they did not experience the bank's websites as easy-to-use or user-friendly.

The other essential requirement of digitally unbanked seniors is that e-banking systems be designed in such a way that the banking tasks can be completed timeously. The notion of timeous completion of tasks is related to the concepts of effectiveness and efficiency of e-banking websites, where effectiveness refers to how well the systems does what it is supposed to do and efficiency relates to how quickly and efficiently the system supports the user in what they want to achieve.

Similar to the current study's findings, the findings by Gopal and Murale (2018) are that the ease of the use of the Internet and the usability of the website influence the Generation X intention to use e-based platforms.

In summary, the study's findings in relation to system design requirements of digitally unbanked seniors are: that the information is easily accessible; information is displayed in a readable way; information on the system interface is understandable; the banking steps are quick; it is simple to use it for banking; and it was designed specifically for people like them as they have different needs to young people.

5.5.4.3 What is the impact of the bank's e-banking awareness and empowerment strategy on digitally unbanked seniors' use of the system?

The findings of the current study demonstrates that the impact of creating awareness about the benefits of e-banking and empowering digitally unbanked seniors in using these services is important to their willingness to use the system.

Figure 5.7 below illustrates the current study's findings on the effect of the bank's initiative in creating awareness and empowerment on digitally unbanked seniors' use.

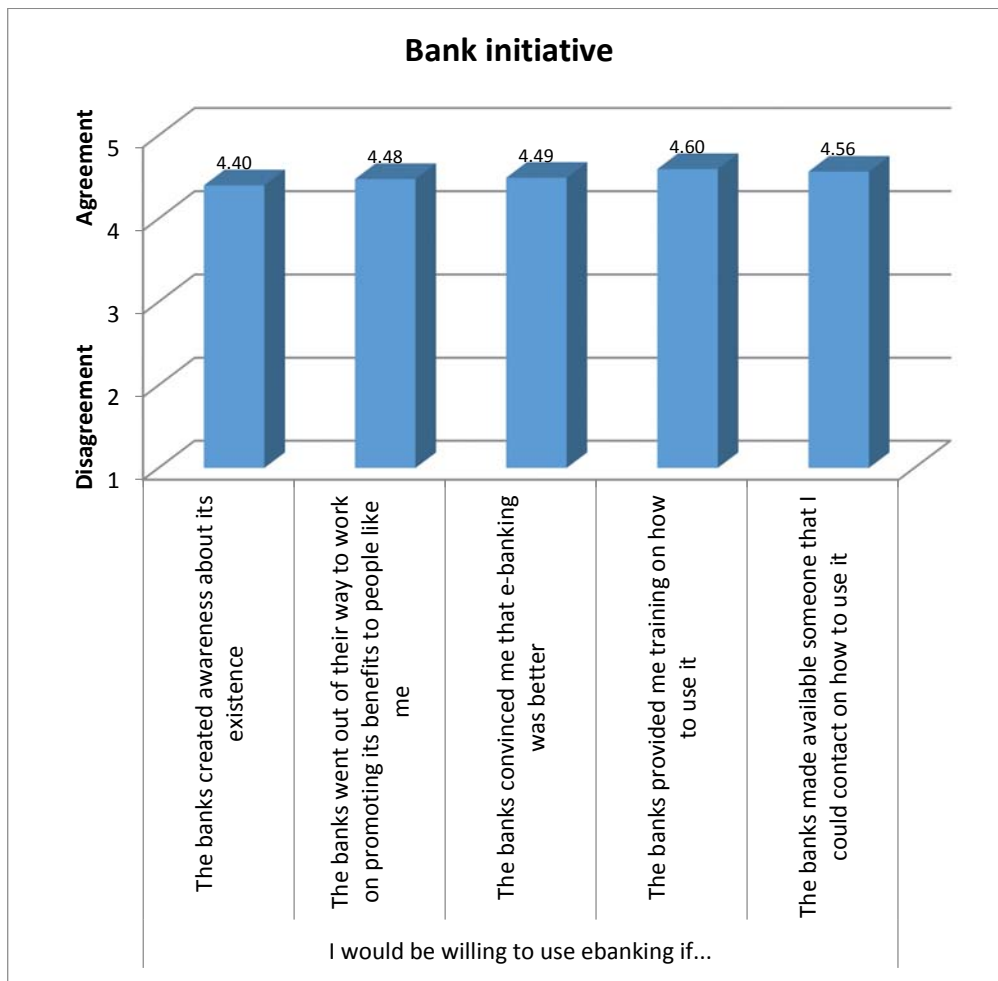


Figure 5.7: Bank initiative factor

Therefore, when digitally unbanked seniors know about the benefits of e-banking and they are empowered, they will be willing to use these services. The current study demonstrates that the majority of digitally unbanked seniors (94.36%) agree that the creation of awareness about the benefits of e-banking will have a positive effect on their willingness to use these services.

As soon as seniors are aware of the benefits of e-banking, they will be motivated to learn to use it, which will eliminate the barriers associated with the complexity of using these services. These findings also support existing literature. Gatsou et al. (2017) found that while seniors were willing to learn how to use e-banking, the complexity of e-banking systems was an adoption barrier.

With these barriers removed, then willingness to use will be increased. Gatsou et al. (2017) found that seniors' taking part in their study thought it was exciting to learn about e-banking as it would save them time and money, but they did not have anyone to teach them about how to use it. Therefore, the current study's findings demonstrate that the banks need to go out of their way to work on promoting the benefits of e-banking among digitally unbanked seniors to convince them to use the services.

The study's findings also reveal that it is statistically significant ($p < .0005$) that digitally unbanked seniors are convinced that e-banking is better and that it is secure. These findings find support in existing literature. Ramavhona and Mokwena (2016) found that the lack of awareness creation and empowering customers with information about e-banking security negatively impacts adoption.

The findings of the current study further demonstrate that providing training on how to use e-banking, as well as dedicated personal support in using it are determinants of digitally unbanked seniors' adoption of these services. These findings support existing literature on the effect of empowerment on value co-creation in other disciplines. For example, Russo, Tartaglione and Cavacece (2019) found that the empowerment of patients enhanced their value co-creating behaviours in the medical sector.

The creation of awareness and empowerment of customers on the benefits of e-banking is even more necessary for those customer segments that have not used e-banking before, such as digitally unbanked seniors. The people who have not been exposed to using e-banking generally have no information on how to access the services, its benefits and how to use it (Lusaya & Kalumba, 2018).

5.5.4.4 *What are the adoption factors to motivate digitally unbanked seniors' use of e-banking?*

The current study's findings demonstrate that e-banking adoption factors for motivating digitally unbanked seniors to use e-banking are: ease-of-use; usefulness; trust; costs; privacy and security; attitude; customer co-creation involvement; bank's initiative in creating awareness and empowerment and, design. These were the determinants that were first identified by the study in the conceptual model and the reliability analysis shows that all the dimensions were reliable.

Attitude (.79), privacy and security (.12) as well as design (.14) were found to be statistically significant and therefore predominant, in motivating digitally unbanked seniors' willingness to use e-banking. In particular, the study's findings demonstrate that attitude (.79) is the strongest determinant of digitally unbanked seniors' willingness to use e-banking. The current study's findings support previous research findings relating to the determinants of e-banking adoption.

Users' attitude towards technology has been identified broadly in adoption literature as a strong adoption determinant. Therefore, the current study's findings that digitally unbanked seniors' attitudes affect their willingness to use e-banking, supports prior findings in relation to the attitude factor (Kumawat, 2014).

Generally, seniors are resistant to change, which results in their negative attitude towards e-banking (Arenas-Gaitán et al. 2015). Prior research (Rafique et al. 2014) established that attitude is a strong functional variable that has an effect on people's future intentions to use technology. Therefore, findings suggest that banks should devise programs that would influence the formation of the attitudes of digitally unbanked seniors towards e-banking to increase usage. Camilleri and Grech (2017) state that when people have a positive attitude towards e-banking then that turns to improve their willingness to use these systems. As a further research focus, it would be interesting to understand the roadmap of the actual process steps that banks should undertake to change the attitude of seniors towards e-banking. The findings in relation to privacy and security in the current study support available literature on the notion that privacy and security is important to motivate digitally unbanked seniors' willingness to use the services. In terms of the findings, when digitally unbanked seniors find e-banking services secure and they are assured of their privacy when using them, they will be motivated to use the system. The prospect of loss of confidential information to third parties and actual material financial loss due to fraud has a negative effect on users' willingness to use e-banking services (Abdou, 2014).

Belás et al. (2016) note that privacy and security are closely related to trust. Consequently, the effect of trust as a motivating factor in the digitally unbanked seniors' willingness to use e-banking can be inferred in the findings on privacy and security although the study did not find trust to be a significant factor. Others, such as Liao et al. (2016) found trust to explain customers' willingness to use e-banking much more than privacy.

The current study's findings also illustrate that the design of e-banking is a factor that motivates digitally unbanked seniors' willingness to use the services. The aspects of design that the findings highlight as important to motivate digitally unbanked seniors' willingness to use e-banking, include: information accessibility, fonts and sizes of icons on the website displays, the ease-of-use of the website, the quickness of completion of banking tasks and that the steps to follow should be understandable. The current research's findings about the importance of design in motivating digitally unbanked seniors' to use e-banking support prior research (for example, Gopal & Murale, 2018; Gatsou et al. 2017; Punyani, 2015).

The results revealed in the current study did not find statistical significance for the ease of use, usefulness, trust, as well as costs constructs. It can however be argued that despite these findings, these constructs remain important to e-banking adoption based on prior research findings, due to their power in predicting use (Nkoyi, Tait & Van der Walt, 2019). PEOU and PU, for example, find their origins in the TAM and they are noted in literature as the most used constructs in understanding e-banking adoption (Ahmad, 2018). The TAM itself has been extended many times and has consistently been proven to be strong in detecting users' willingness to use e-banking (Lin et al. 2015).

For example, Safeena, Date, Hundewale and Kammani (2013) found that perceived usefulness was the most important factor in motivating the use of e-banking. When considering the findings on the various aspects of design as a factor that the study finds to be statistically significant in motivating use, one of the noted aspects is that the e-banking steps should be quick and easy to follow. Quick and easy steps relate significantly to the PU factor, because if the steps are not quick and easy to follow then digitally unbanked seniors will not perceive e-banking as being useful to them.

While trust has not been found to be statistically significant, it remains a notable factor for motivating e-banking use, especially when considering its close association with privacy and security, which have been found to be a significant motivator. Trust has also been found to be significant in motivating users' willingness to use e-banking in previous research (Alwan & Al-Zu'bi, 2016).

In relation costs, the World Bank (2014) cites it as one of the major barriers of financial inclusion, globally. Therefore, cost is one of the factors that influence the motivation of people to use e-banking. When considering access to banking in general, costs as a barrier, especially in developing economies, include the costs of travel distances to access a bank and the loss of productive time.

Naturally, it would be expected that the convenience brought about by e-banking will circumvent these traditional banking costs. However, Lusaya and Kalumba (2018) note that the costs that customers, such as digitally unbanked senior, have to incur to use e-banking can include the cost of equipment, connection charges to access e-banking, charges per usage, incomplete transactions and defective services.

5.5.5 Hypotheses Testing

Hypotheses were developed to test for the causal effect in the relationships between constructs. The table below presents the results.

Table 5.18: Hypotheses testing.

Hypotheses	Outcome
H#1: Digitally unbanked seniors' involvement in the SDL e-banking will have a direct, positive effect on their willingness to use the services.	Not supported .02
H#3: e-banking services that are designed to take into account the needs and wants of the digitally unbanked seniors, in terms of their cognitive challenges, will have a direct, positive effect on this segments' willingness to use the services.	Supported .14
H#2: The banks' creation of support and awareness of the benefits of e-banking to digitally unbanked seniors will have a direct, positive effect on their willingness to use the services.	Not supported .02
H#4: e-banking services that are easy-to-use will have a direct positive effect on digitally unbanked seniors' willingness to to use the services.	Not supported .05
H#5: e-banking services that are seen to be trustworthy by digitally unbanked seniors will have a direct, positive effect on this segment's willingness to use the services.	Not supported .00
H#6: e-banking services that are not private and secure will have a direct, negative effect on digitally unbanked seniors' willingness to use the services.	Supported .12
H#7: e-banking services whose fees and charges suit the pockets of digitally unbanked seniors will have a direct, positive effect on their willingness to use the services.	Not supported .05
H#8: Digitally unbanked seniors' positive attitude to e-banking will have a direct, positive effect on their willingness to use the services.	Supported .79
H#9: e-banking services that are seen as useful by digitally unbanked seniors will have a direct, positive effect on their willingness to use the services.	Not supported .05

In summary, the study's findings around hypotheses testing demonstrate that there is a causal relationship towards users' willingness to use e-banking from the following constructs: e-banking design, attitude as well as privacy and security.

5.6 FINDINGS INTERTWINED WITH THEORY

The theoretical framework chapter (Chapter 2) presented the various technology adoption theories that informed the framing of the current research study. According to Hajiyev (2017), the following are the theories that are commonly used in the conceptualisation of e-banking research: Innovation Diffusion Theory, TRA, TPB, TAM, UTAUT, TIR and TPR. Discussions on these theories, which find their origins in psychology and sociology (Arenas-Gaitan et al. 2015) were presented in the Chapter 2.

Saeed et al. (2015) are of the opinion that e-banking research is typically based on the theoretical assumption that there are factors that are important to believe formations of people toward ICTs that influence use. This is true for both technology diffusion and technology resistance theories. Therefore, consequent to the evaluation of the noted theories, the study chose the TAM as its framework for answering its questions and achieving its objectives.

The TAM has been tested and validated in various ways in e-banking adoption studies (Alkailani, 2016). However, the model proved inadequate in addressing all the study's objectives (for example, the notion of customer co-creation of e-banking adding value). Consequently, to achieve the study's stated objectives, the TAM was infused with constructs originating from the TPB and the TPR, as well as the construct of users' co-creation in SDLC originating from Baroudi et al.'s (1986) User Involvement and Information Satisfaction Theory.

The attitude construct used in the study finds its origins from the TRA (Ajzen, 2002). In addition, the willingness to use construct, which is parallel to the TRA's behavioural intention, was also included. Elements of these theories formed the basis for the study's framework model.

Construct reliability testing confirmed the reliability of all the study's constructs (all the constructs are $>.07$) and there was adequate convergence and higher distinct validity of the scale (AVE $.05$) in accordance with literature recommendations (Hair et al. 2006). The present study's conceptual model in its original form did not fit with the data and was therefore insufficient. Therefore, 12 items were removed following CFA to achieve fit.

The study's results showed that there is willingness amongst South Africa's digitally unbanked seniors to use e-banking and their e-banking system design requirements were also identified. In addition, the findings demonstrated that privacy and security, design and attitude are the statistically significant motivating factors of e-banking use of digitally unbanked seniors in South Africa. The results also demonstrated the following paths as significant: The paths from attitude to willingness to use, from privacy and security to willingness to use and from design to willingness to use are all significant.

5.7 EXTENT TO WHICH THE EMPIRICAL RESULTS ENABLED ANSWERING THE RESEARCH QUESTIONS

The adoption of e-banking by all customer segments is an important area of focus for the banks given their increasing investment in the digitization of banking services. The seniors' customer segment is particularly reluctant to adopt new technologies (Golant, 2017), meanwhile they are the single growing population group globally. E-banking is also seen envisaged to play an important role in facilitating financial inclusion. Consequently, seniors stay digitally unbanked.

Extent literature on e-banking adoption (for example, Vittelri et al. 2016) increasingly point to the need for the banks to involve customers, from a value co-creation perspective, in the design of e-banking systems to increase adoption. Olphert (2013) opines that firms should consider customizing technology services in accordance with the needs of seniors which are often consequence of old age. It was the aim of the present study to answer four research questions concerning the e-banking of digitally unbanked seniors.

Research question 1:

Research question 1 of the study aimed to find out the effect of involving digitally unbanked seniors in the SDL on their willingness to use e-banking. The research question was answered through responses to items in a Likert Scale in the survey questionnaire.

The responses confirmed that the majority of digitally unbanked seniors were willing to use e-banking if they were involved in the SDL.

The findings of earlier research by Gatsou et al. (2017) on seniors' e-banking intentions established that seniors are enthusiastic about learning to use e-banking, which demonstrates alignment. Therefore, when they are involved in the service's co-creation their levels of customer satisfaction will be improved. The findings of Malik and Ahsan (2019) research demonstrate a strong correlation between customer satisfaction and co-creation in banking. The present study's findings adds its support to the extent notion that value is not solely created within the confines of the boundaries of the firm.

When CFA was conducted on the factor attached to this question, upon the examination of the standardised loadings and MIs, Item 4 (CustInv4) was removed, as it had a low loading (.516) in comparison to the other four items in order to improve fit. The factor was tested as reliable.

Research question 2

Question 2 of the present study pre-empted digitally unbanked senior's willingness to use e-banking. Therefore, the research question sought to establish the e-banking system design requirements of South Africa's digitally unbanked seniors. Responses to the questionnaire section in a Likert scale on the measures via the conducted survey were utilised to answer the question. The findings indicate that the system design requirements of the digitally unbanked seniors are that: the information of the e-banking system should be easily accessible, information should be displayed in a readable way, information displayed should be understandable, e-banking should be easy-to-use, and, the banking steps should be quick.

The findings support earlier research by Ling et al. (2016) that established e-banking system design quality as an important customer satisfaction aspect that impact on whether customers are willing to use the system. In particular, web design and content have been established to be among the top three important factors in determining e-banking usage (Ling et al. 2016).

The present study's positive findings on system design are predominantly focused on these two aspects relating to the design of the system and the web content. The research by Domeher, Frimpong and Appiah (2014) also recommended that banks should design and deploy banking innovations that are easy to use for customers after establishing this factor as important to customer's adoption of banking technology.

Item 1 of the design construct was removed upon examination of loadings and MIs when CFA was performed, and construct reliability was also positively tested.

Research question 3

The objective underpinning research question 3 of the study was to understand the impact of e-banking awareness and empowerment on digitally unbanked seniors' willingness to use e-banking. Given that the survey was the only data source for the study, the research question was answered through the answers collated via the structured survey questionnaire.

The findings demonstrate support for the notion that empowering customers with knowledge on the benefits of e-banking and the know-how on how to use these services affect their willingness to use it positively. The study's findings are aligned to research findings of Amutha (2015) that demonstrated that banks have to take additional steps to educate their customers about the technology services offered to increase adoption. In particular, the present study argues that the awareness of e-banking is amongst the available solution to bring unbanked seniors into the financial market space.

The findings of Khandre (2015) demonstrate that the creation of more awareness of e-banking will ensure the penetration is not isolated to the high-end market segments, and actually benefit the unbanked. Similar to the present study's findings, Noreen (2015) found that once people have been empowered with e-banking knowledge they tend to use these services and find that the services improve their lives. The findings of the present study in relation to this research question when aligning it with the results of research question pertaining to co-creation, appear to support the results of Maria, Dimitris and Dafni (2014) whose findings were that co-creation is also influenced by marketing.

In the findings of the research study by Jehan and Ansari (2018) it is argued that the banks should make more information available about the benefits of e-banking in order to improve the adoption of these services. The present study's findings support the findings of these existing studies in relation to improving the awareness of e-banking services and their benefits as a means of banking digitally unbanked seniors and attaining financial inclusion goals. The examination of the standardised loadings and MIs when CFA was performed illustrate that two items should be removed from the factor (Item 3 and 5).

Research question 4

The fourth research question aimed to establish what the e-banking adoption factors for motivating digitally unbanked seniors' use of these services are. The present study's findings demonstrate that e-banking adoption factors for motivating digitally unbanked seniors to use e-banking are: easy-to-use, usefulness, trust, costs, privacy and security, attitude, customer co-creation involvement, banks initiative in creating awareness and empowerment, as well as design.

Notably, the findings demonstrate that privacy and security, design and attitude were the strongest determinants of South Africa's digitally unbanked seniors' willingness to use e-banking. Security has been found to be one of the factors influencing e-banking adoption and the present study's finding support extent literature on this aspect. The finding of Kujur and Shah (2015) demonstrates that security risks are among the most important factors impacting e-banking adoption. Security concerns of e-banking also impacts on trust, therefore this reaches further as a factor.

The present study's finding on security support extent literature that to improve the adoption of e-banking, banks must address concerns regarding the privacy of their information (Chavali & Kumar, 2018) as well the risks relating to the potential loss of their money or time lost using the services (Virk, 2013). Customers get concerned about loss of personal information (Musaev & Yousoof, 2015) and the faceless nature of e-banking poses even increased risks fears for potential new customers such as the digitally unbanked seniors.

Attitude as a factor influencing e-banking adoption is grouped in the individual users' attributes category. The present study's findings support existing literature findings of Alkailani (2016) demonstrating a positive correlation between attitude and intention to use e-banking. Similar to the present study, prior research by Nkoyi et al. (2019) that attitude strongly predicts the intentions of using e-banking systems. Therefore, when customer's attitude to e-banking is positive then they will use the services (Koenait et al. 2019).

The study's measurement model was evaluated, adjustments were undertaken to achieve fit and, when good fit was attained, it was converted into a structural model. This was achieved through the empirical research conducted in the study.

5.8 RESULTS VERIFIED BY AN EXPERT FOCUS GROUP

The study's results were discussed with a focus group of experts in the banking industry as a verification measure. In preparation for the focus group, the researcher identified and sourced a transcriptionist who took minutes and recorded the discussions of the focus group participants. The researcher approached the South African Banking Risk Information Centre (SABRIC) and requested that SABRIC contact banking industry senior officials who are responsible for the e-banking channel and products to participate in the focus group. SABRIC is an industry body of the banking industry in South Africa that has a depository and access to banking industry officials.

Given that the study's topics intercedes banking technology adoption and the notion of financial inclusion, and that the findings demonstrates statistical significance of the privacy and security construct, the expert group included participants from commercial banks (Standard Bank, FNB, ABSA and Nouvobanq), the Banking Association of South Africa, the Reserve Bank of South Africa and SABRIC. SABRIC afforded the study a boardroom where the focus group was held. A total of six of the focus group participants physically attended the focus group discussions while one participant, based in Madagascar, joined the session via Skype. The participants took part in the focus group consequent to their professional interest in the topic.

Table 5.19: Distribution of focus group participants and their profiles

Title	Years of Experience in Position	Gender
Head: Digital Banking	10	M
Head: Fraud Risk Management	15	F
Senior Manager: Programme Office	10	M
Senior Manager: Digital Banking Crime	8	M
Manager	5	M
Group Senior Manager	7	F
Head: Internal Audit	13	M

Study objective 1 sought to determine the effect on willingness to use e-banking of involving digitally unbanked seniors in the SDL of these services. The expert group were generally in concurrence with the study's findings pertaining to this objective. The general view of the expert group is that, as a principle, involving customers in banking systems development is important to eventual usage.

The discussion then ventured into the practical means with which customer involvement could be implemented, including the consideration of open-source platforms by the banks. In this regard, the participants expressed their surprise that there was willingness to use e-banking by digitally unbanked seniors given the low diffusion of technology applications and access to data in South Africa in general.

In addition, the expert participants expressed their uncertainty as to what could be the factors that could have caused this aspect not to be statistically significant as they concurred that it was important to adoption. Therefore, from the feedback of the expert group discussion, the study's findings empirically demonstrate the effect on willingness to use e-banking.

Study objective 2 aimed to define the e-banking design requirements of South Africa's digitally unbanked seniors. The expert group discussion was aligned with the study's findings that the design of an e-banking system should cater for the specific needs of the digitally unbanked in terms of the website's accessibility in relation to the displays, information simplicity and the quickness of the steps of the banking tasks performance. However, the participants were surprised that there was willingness among digitally unbanked seniors in the study's population to use e-banking given their low literacy levels.

The expert group discussion also agreed with the findings of objective 2 in that, due to available advanced technologies, the banks should be able to customise e-banking at an individual level, especially with regards to applications. In addition, the expert group agreed with the study's findings in relation to e-banking customisation that is specific to the senior market with regards to design aspects, such as website features, layout and icon sizes. The findings aligned with the experts' views with regards to e-banking, which demonstrates that the study's findings empirically align to the objective.

The expert group concurred with the study's findings in relation to Study objective 3 that sought to determine the effect of banks' e-banking awareness and empowerment efforts on digitally unbanked seniors' use.

The expert group further indicated that empowerment and awareness of senior customers should address the technology usage issues that may emanate from the users' different literacy levels. In this regard, the expert group advanced that in their field experience, lower levels of literacy are some of the causes of cybercrime in the banking sector.

Study objective 4 in the current study determined factors that are important to South Africa's digitally unbanked seniors' use of e-banking. The expert groups concurred with the study's factors, as listed in the findings. In particular, the privacy and security factor, which was established as statistically significant, was singled out by the expert group as important, given that it is a risk to the banks and the e-banking product.

Additionally, the experts in the focus group were surprised that the findings did not demonstrate statistical significance for the costs factor. The World Bank (2014) identifies cost as amongst the most notable barriers to access to e-banking. However, the expert group concurred with the study's findings in relation to the statistical significance of attitude in the adoption of e-banking by digitally unbanked seniors.

5.9 CONCLUSION

Today's global trends demonstrate that seniors are the single most growing population, globally. While most technology is increasingly being used for many daily activities, seniors are noted to be reluctant to use it, which poses a challenge for business. In banking, technology is increasingly becoming the main means of providing services to existing and new customers, including digitally unbanked seniors.

Technology-driven banking is also poised to be important in bridging the financial inclusion gap, globally. The current study's results provided empirical results on South Africa's seniors' e-banking willingness to use motivating factors and the effect of involving this segment in the e-banking SDL to ensure that the design of the systems cater for their needs, thereby improving their willingness to use and their inclusion into the financial marketplace.

The study's findings demonstrate the development and confirmation of a theoretical framework, in the form of a roadmap of how the banks can bank digitally unbanked seniors. The findings also depict the causal relationships among digitally unbanked seniors' e-banking adoption factors. The strength of the attitude factor on the digitally unbanked seniors' willingness to use e-banking was depicted in the study's findings. In particular, the study's findings demonstrate the importance of ensuring that e-banking designs are customised to the needs and wants of digitally unbanked seniors to improve use.

Therefore, the findings of the study demonstrate that the current study met its research aim and answered the initially set research questions. The research study also provided insights that could be beneficial to banks in South Africa when it comes to banking digitally unbanked seniors, thereby contributing to financial inclusion.

Chapter 5 described the results of the study's survey method, the sample response rate and the demographic characteristics of the respondents, as well as the key features of the respondents' financial circumstances. The findings of the SEM analysis and the hypothesised model testing were also presented, as well as the study's criteria for model specification and the fit indices deployed. The hypothesised theoretical model and proposed hypotheses tested using AMOS 10 were also presented in the chapter. In addition, a discussion of how the study's empirical results entwined with theory was presented, as well as the outcomes of the focus group of banking industry experts were presented.

The following chapter provides the recommendations drawn from the current research study. Chapter 6 also illustrates the current study's contribution to the literature. The limitations of the study are also discussed and areas for further research emanating from the present study's findings are presented.

CHAPTER 6

RECOMMENDATIONS

6.1 INTRODUCTION

The preceding chapter presented the data analysis and findings of the present research study. In particular, Chapter 5 presented the study's measurement and structural model, as well as a discussion of the statistical findings. The findings of this research study are utilised in this chapter to propose recommendations.

In the following section, a discussion of the proposed strategies and recommendations to the banks stemming from the study's findings are presented. This discussion focuses on the banks' possible technology considerations in relation to the adoption requirements of digitally unbanked seniors. Furthermore, the study's possible contribution to knowledge is presented in this chapter as well as the study's limitations. Thereafter, a discussion on the possible areas of further research is presented.

6.2 RECOMMENDATIONS

The most important finding of this research study is that digitally unbanked seniors are willing to use e-banking. Therefore, this indicates that there is an opportunity for banks to digitally bank unbanked seniors and contribute to financial inclusion. As such, the research findings demonstrate that there is no misalignment in intentions between digitally unbanked seniors and the banks' continued deployment of banking technology.

Based on the research findings, it is recommended that banks should proactively take advantage of the growing global seniors' population to increase their technology banking market shares. Another benefit of digitally banking seniors is the resultant increase in the number of financially included persons given that, as a vulnerable group, seniors are among the people excluded from full participation in the financial marketplace. Consequently, this lays down the first principle outcome of this body of research: *The banks can utilise e-banking to bank digitally unbanked seniors and contribute towards financial inclusion.*

The findings of this research study also demonstrate that seniors have specific requirements in relation to e-banking, which inform their willingness to use these services. There is ample existing literature findings that indicate that the requirements of seniors for many types of technologies generally differ to those of younger users. Generally, the seniors segment's requirements divergence is a consequence of changes due to age seniority that include vicissitudes in health, lifestyle and psychographic needs, which results in unique marketplace needs. It is this research study's recommendation that the banks consider specific e-banking requirements of seniors before deploying the services as a means to appeal to their usage. In particular, the usability of the channel platforms providing e-banking to the specific user groups targeted is significantly important to their usage.

The findings of this study and the available literature demonstrates that many businesses are able to satisfy the requirements of various customer segments through users' involvement in co-creation. In relation to e-banking, digitally unbanked seniors and the banks can achieve this through various forms of customer co-creation measures that have proven productive in attaining customer affinity to products and services.

First, it is recommended that banks deploy technology to facilitate seniors' e-banking virtual co-creation. In this regard, digitally unbanked seniors are enabled to virtually co-create e-banking value to meet their customised requirements. Therefore, seniors are enabled to co-create and customise the front-end of the e-banking channel platform according to their needs and requirements.

In this regard, algorithms could be activated in the back-end system of the single customer-facing platform for the purposes of directing the senior customers to their segment-specific platform after verifying the logon details that they have keyed-in. In this way, the log-on details would be the verifier for linking every customer to their customer segment-specific e-banking services offering.

Traditional mechanisms of customers' input collation, such as surveys and qualitative data sourcing can also be used to gather the specific requirements of digitally unbanked seniors in the various SDL phases of e-banking design. The study's structural model confirmed the customer involvement path to willingness to use and eventual usage of e-banking by digitally unbanked seniors.

The second principle outcome of the research materialises here: *The banks can increase the digitally unbanked seniors' customer segment's adoption of e-banking by involving them in various ways in the design stages of these services.*

In this study, it was found that the design of e-banking is an important factor that is statistically significant when it comes to convincing digitally unbanked seniors to use e-banking. The e-banking system aspects, such as website usability, information accessibility and the ease of the banking steps involved are among some of the listed design factors that influence usage. Just as customers cannot purchase a product they do not see on the shop floor, digitally unbanked seniors cannot use e-banking if they cannot access the functions they need to do banking in terms of the designs that are not suited to them.

The study recommends that, as a measure to increase digitally unbanked seniors' use of e-banking, the banks deploy age-appropriate e-banking designs that are accessible to this customer segment which consider their perceptual and motor skill challenges. The current one-size-fits-all approach (Mujinga et al. 2018) impedes wider usage by other customer segments, such as digitally unbanked seniors.

Customer engagement metrics should be utilised for the purposes of identifying seniors' design requirements and preferences. In this regard, e-banking services will be found to be more usable to the seniors' customer segment.

The third principle outcome of the research study from its findings is that: *The banks should undertake measures to ensure that the e-banking platforms are designed to cater for the seniors' customer market in terms of factors, such as the display of information, icons and fonts.*

The findings of this research work also demonstrate that digitally unbanked seniors' attitude towards e-banking is the strongest factor in their decision-making of whether to use these services or not. As many factors contribute to digitally unbanked seniors' attitude, such as the perceptual factors accompanying the deployment of the services and the general lack of awareness of the e-banking benefits for those who are yet to use the services.

It is therefore recommended that the banks deploy tailored awareness and marketing communications campaigns empowering digitally unbanked seniors about the benefits of e-banking and addressing perceptual issues around factors, such as costs and risks to improve these users' attitude.

The banks should ensure that seniors access information that change their perceptions that e-banking services are designed to serve only the needs of younger mobile customers. Amongst the factors that banks should address is the perceptions risk associated with e-banking to build serves' confidence and positive attitude of potential new users, such as digitally unbanked seniors.

The fourth principle drawn from the study's findings is that: *The banks should deploy measures that ensure that the attitude of seniors towards e-banking is positive as that will confidently impact this customer segment's adoption of these services.*

The findings in Chapter 5 also demonstrate that privacy and security are important when it comes to convincing digitally unbanked seniors to use e-banking. The findings illustrate that privacy and security are more important to digitally unbanked seniors' willingness to use e-banking than the costs of these services. It is therefore recommended that the banking industry puts more emphasis on the privacy and security dimensions of e-banking to attract digitally unbanked seniors' use of these services and bridge the financial inclusion divide. The study also recommends that the banks create customer awareness initiatives showcasing the privacy and security dimensions that the services offer customers.

The further recommendation for banks is that they should ensure the effective holistic management of fraud incidents affecting existing e-banking users given the rise in cybercrime. In this regard, banks should robustly continue fraud awareness and education programs to educate customers about measures of detection of possible fraudulent activities. As a result, heightened visibility of less e-banking fraud incidents in public media platforms will have a positive effect on digitally unbanked seniors', and other bottom of the pyramid customers' concerns about the safety and security of e-banking.

The fifth principle outcome of the research study is that: *The financial inclusion of digitally unbanked seniors utilising e-banking will be improved via e-banking when banks ensure that this customer segments' concerns about the privacy and security factors on these services are cause for no apprehension.*

Banks should provide customers with appropriate advice on scams and ensure the speedy resolution of fraud-related incidents affecting their existing e-banking users. As a consequence of these measures, banks will impact the overall public's perceptions about the privacy and security of e-banking positively. Therefore, there may be improved confidence in the e-banking services by all the non-users, including digitally unbanked seniors.

The study's findings and literature review demonstrate that digitally unbanked seniors are willing to use e-banking. Therefore, these findings illustrate that there are opportunities for banks to improve financial inclusion using e-banking platforms. However, attitude is a significantly important determinant of the digitally unbanked seniors' willingness to use these services and this market segment generally does not have a positive attitude towards technology.

The banking industry in South Africa must collectively measure the drivers of digitally unbanked seniors' attitude on a continuous basis, instead of the individual banks undertaking their own market studies. Attaining financial inclusion objectives is a national imperative that affects the banking industry as a whole. For example, annual surveys assessing the attitude of the e-banking attitude formations of the digitally unbanked seniors will assist the banks to have a barometer and employ versatile strategies for this market.

6.3 CONTRIBUTION TO KNOWLEDGE

Although e-banking is a widely discussed topic, there is still a paucity of research that focuses on the financial inclusion of digitally unbanked seniors in developing countries utilising e-banking. In particular, literature is limited in discussing the e-banking of digitally unbanked seniors wherein these customers' co-creation involvement of these services' value is a consideration. Therefore, the present research study contributes to this specific area of the e-banking adoption body of work.

The research study's main contribution is an empirical framework on how South African banks can e-bank digitally unbanked seniors. Therefore, the practical implications of the research findings for banking practitioners, scholars and policymakers are that the findings of the current study are applicable in South Africa for assessing, monitoring and increasing the adoption of e-banking among digitally unbanked seniors. It is envisaged that the practical benefit of the study's outcomes to banking practitioners and policymakers is that the study will improve their efforts of attaining universal financial inclusion.

The study also assists the banking practitioners and policymakers in understanding the factors that are important to digitally unbanked seniors' use of e-banking. In this regard, the bank practitioners and policymakers will be empowered with empirical information to implement interventions that will possibly increase digitally unbanked customers' uptake of e-banking. Consequently, information from the research will possibly help the banks achieve their objective of reducing the operating costs of servicing brick-and-mortar branches. The findings of this research study will also help the banks and other financial services role players better understand the drivers of digitally unbanked seniors' willingness to use e-banking through relevant empirical research work.

In particular, banking practitioners will benefit from the insight that the use of e-banking by digitally unbanked seniors will increase if the design of the service platforms meet their requirements in terms of information quality, displays and usability. Additionally, practitioners and policymakers will benefit from the insight that when digitally unbanked seniors trust that the e-banking services are safe and there is security provided for their information and money, it would lead to their willingness to use these services.

Finally, the findings of the study will help banking practitioners and policymakers understand the importance of the role of digitally unbanked seniors' attitude towards e-banking and its effect on their intention to use these services. Seniors' attitude towards e-banking is the most statistically significant factor that influences their intention to use these services. Banking practitioners, as well as policymakers, should devise innovative measures that are sufficiently practical in improving their positive attitude formation. Lastly, banking practitioners evaluating channel market segments will benefit from the research finding that digitally unbanked seniors are willing to use e-banking.

6.4 THE LIMITATIONS OF THE STUDY

The main limitation of the present study is that, while its focus is on the e-banking of digitally unbanked seniors in a developing country context and South Africa as its location fits this profile, the population sample was drawn from one province (Gauteng) only (for practical, logistical reasons). Although Gauteng is the most populous province in South Africa and enjoys the highest economic activity, future studies should consider a sample that covers all the country's provinces as that will strengthen the generalisability of the findings.

The other limitation of the present study is that it was cross-sectional, in that it looked at the circumstances of digitally unbanked seniors at a particular point in time. Therefore, longitudinal designs that explore the transition from digitally unbanked seniors' willingness to use e-banking to actual behaviour (actual use) in order to show causation should be considered.

The third limitation is that the study's seniors' population sample was constituted by seniors receiving SASSA social grants merely, because they specifically fit the profile of the financially excluded and they have a regular monthly income. It is possible that a study with a population of seniors with more diverse sources of income as well as diverse wealth standings would yield different results.

6.5 POSSIBLE AREAS OF FURTHER RESEARCH

Consequent to the present research study's findings and the literature, the following areas of further research are proposed:

- The present research study was limited to responses from participants based only in South Africa. Therefore, it will be an interesting area of research to conduct a similar study in a different developing country to assess whether it yields similar results.
- The population of the present study comprised predominantly of digitally unbanked seniors whose source of income is SASSA state social grants disbursements. Given that having a source of income is an important requirement to access banking, it will be an interesting area of further research to replicate the study focusing on digitally unbanked seniors who have other sources of income and wealth statures.

- The findings of the research study demonstrate that attitude is a strong determinant of digitally unbanked seniors' willingness to use e-banking and generally seniors do not have a positive attitude towards new technologies, such as e-banking. Therefore, a study determining the specific drivers of the attitudes of digitally unbanked seniors towards e-banking would serve to augment the topical area addressed in the study.
- The findings of the research study demonstrate that privacy and security, design and attitude are significant determinants of digitally unbanked seniors' e-banking use. A qualitative study that unpacks, in-depth, the digitally unbanked seniors' explanations of these factors in relation to willingness to use is recommended.

The study has laid the foundation for further research into the investigation of digitally banking unbanked people in general, which is a topic that should be explored further.

6.6 CONCLUSION

This final chapter of the study provided recommendations for bank managers on the topic of e-banking digitally unbanked seniors, provided a discussion on the study's contribution to the body of knowledge on the topic and explained the study's limitations. The chapter also provided direction on the recommended areas of further research.

The current research study contributed an empirical framework on how, in a South African context, banks can bank digitally unbanked seniors through unpacking factors that are important for convincing these people's willingness to use e-banking. In this regard, the current research study presented empirical insights that privacy and security, attitude and the design of e-banking services are significant factors that influence digitally unbanked seniors' willingness to use these services

Based on the findings of this study, recommendations were made for banking practitioners and policymakers on which factors to possibly consider in relation to increasing financial inclusion of digitally unbanked seniors. The research study's findings predominantly support existing literature on the notion of digitally unbanked seniors' willingness to use e-banking on account of suitable designs, improved satisfaction with privacy and security, as well as positive attitude augmenting initiatives.

Through this research and the recommendations presented in this chapter, it is proposed that ICT's, and e-banking in particular, have potential to become a catalyst for universal financial inclusion. Therefore, the present research study contributed to the academia, banking practitioners and policymakers.

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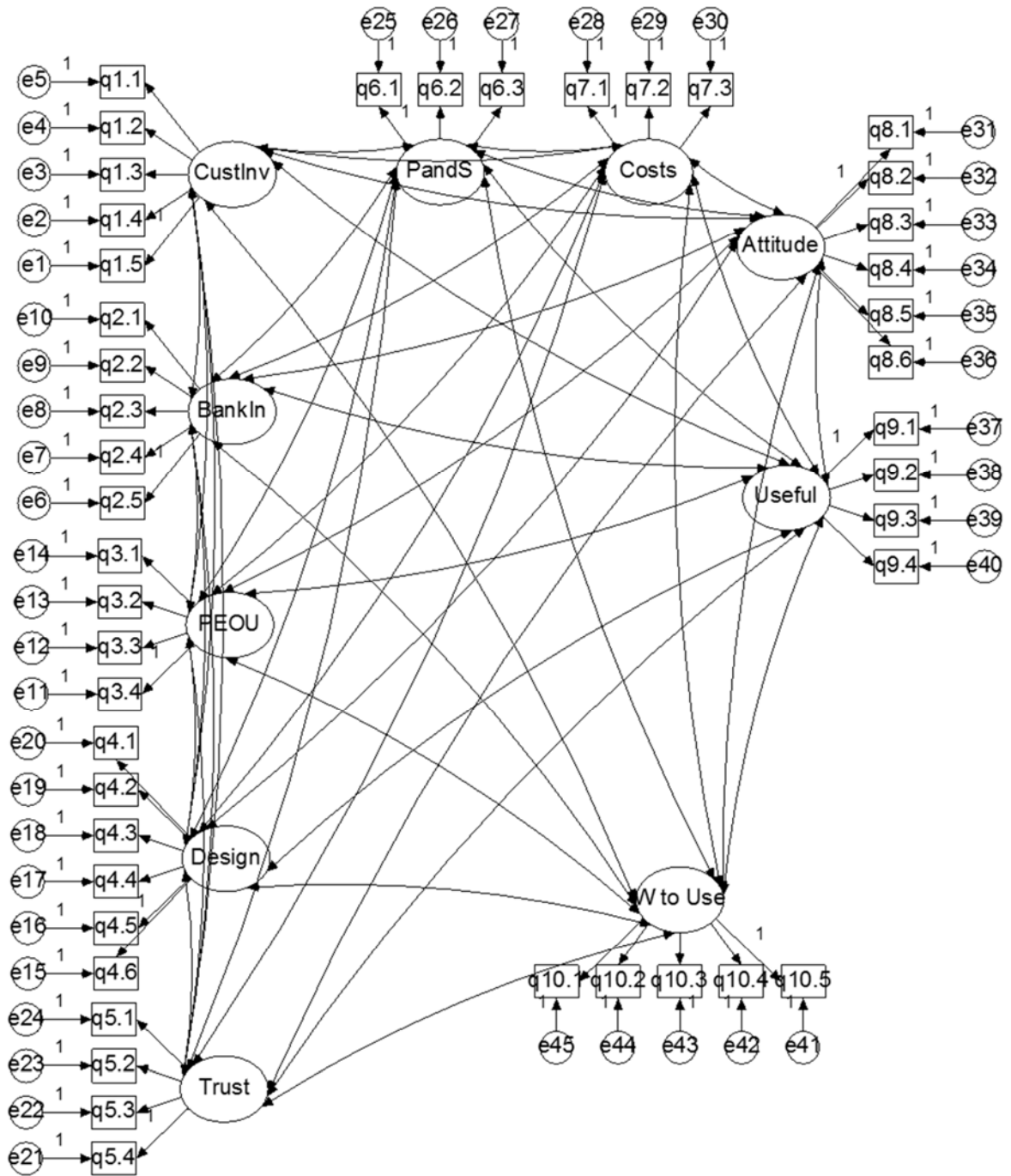
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ANNEXURES

Annexure 1: Initial Full Measurement Model (45 Item Model)



Annexure 2: Questionnaire

FOR OFFICE USE ONLY: Respondent Code: _____

VOLUNTARY QUESTIONNAIRE FOR PARTICIPANTS

“Banking technology acceptance for seniors”
University of South Africa, School of Business Leadership
Researcher B Diako
Supervisors: Prof Sam Lubbe & Prof Rembrandt Klopper

Introduction of the study to the respondents (For use by data collectors)

We need your help to understand how seniors view banking technology. This information is required as part of a Doctorate research by Bongani Diako with UNISA’s School of Business Leadership. Although we would like you to help us, you do not have to take part in this survey. If you do not want to take part, thank you for the opportunity you have given me to talk to you. I will only ask you about things that you should feel comfortable telling us about. (Note to data collector: Let the respondent know that if s/he does not feel comfortable answering a question, s/he can indicate that s/he does not want to answer it. Also assure the respondents of confidentiality for those questions that they do answer as follows ...)

What you say will remain private and confidential. No one will be able to trace your answers back to you as an individual.

Instructions to Data Collectors

Please ask the respondents to answer the questions as truthfully as they can.

Please be sure to read out each part to the respondents.

Mark a response by making a cross with a PEN (not a pencil) in the appropriate box.

PART A: DEMOGRAPHICS

A1 Age

50-55	56-60	61-65	66+

A2 Gender

Male	Female

A3 Race

Black	Coloured	Indian	White

A4 Highest level of education

No formal education	Some/all Primary school	Some High school	Matric	Degree/ Diploma	Higher degree

A5 Indicate if you currently receive income from any of the following: (Tick ALL that apply)

A5.1 Monthly pension pay-out	
A5.2 SASSA	
A5.3 Monthly stipend from family	
A5.4 Other	

If 'OTHER' Please specify:

A6 Who assists you with the management of your monthly financial affairs?

A6.1 I manage my own finances	
A6.2 A family member helps me	
A6.3 My neighbor/friend helps me	

A6.4 A social worker/care giver helps me	
A6.5 Other – Specify	

If “OTHER” Please specify: _____

PART B: E-BANKING

Indicate your agreement with the following statements:

Customer Involvement

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1.1 The bank involved me in its creation before it is developed					
1.2 I was able to have input into the system development regarding the required banking steps					
1.3 I was able to share my insights about my specific needs and wants as a senior customer in the banking process					
1.4 I was able to make it suitable to my needs					
1.5 I was part of the process of developing it					

Bank Initiative (Awareness & Education)

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
2.1 The banks created awareness about its existence					

2.2 The banks went out of their way to work on promoting its benefits to people like me					
2.3 The banks convinced me that e-banking was better					
2.4 The banks provided me training on how to use it					
2.5 The banks made available someone that I could contact on how to use it					

Design

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
3.1 It was designed such that information is easily accessible					
3.2 It was designed such that information is displayed in a readable way					
3.3 It was designed such that information on the system interface is understandable for me					
3.4 It was designed such that the banking steps that I must follow were quick for me to do my banking					
3.5 It was designed such that it was simple for me to do my banking using it					
3.6 It was designed specifically for people like me in terms of its features (e.g. large clear font), as I have different needs to younger people					

Perceived Ease of Use

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
4.1 It was easy for me to use					
4.2 It did not require a lot of effort from me					
4.3 It was easy for me to become skilful at using					
4.4 Using it enabled me to manage my money affairs more easily					

Trust of E-banking

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
5.1 I could trust it					
5.2 I could trust the bank providing it					
5.3 I was given sufficient protection to ensure that I would not fall victim to fraud scams and lose money					
5.4 It (e-banking) always provided accurate up to date results					

Privacy and Security

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
6.1 It was sufficiently secure to bank with it					

6.2 The bank providing it had the expertise to ensure that my banking information is kept private					
6.3 My banking behaviour remained confidential					

Costs

As a senior customer, I would be willing to use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
7.1 It cost me less to use it compared to traditional 'in the bank' banking					
7.2 I was not required to spend money on upgrading/purchasing equipment in order to use it					
7.3 The bank didn't charge me high fees to use it					

Senior customer's attitude to e-banking

When it comes to using e-banking, as a senior customer my attitude is:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
8.1 I like the idea of using it					
8.2 I think that using e-banking is a good idea					
8.3 Using e-banking appeals to me					
8.4 E-banking could be exciting					
8.5 E-banking could be advantageous for me					

8.6 I could enjoy the challenge of e-banking and find it stimulating					
---	--	--	--	--	--

Perceived Usefulness

As a senior customer, I would use e-banking if:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
9.1 It was useful in my banking					
9.2 It improved my banking experience					
9.3 It helped me complete my banking tasks more quickly					
9.4 It increased the effectiveness of my banking					

Senior customer's willingness to use e-banking

When it comes to my preparedness to use e-banking:	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
10.1 I am willing to try e-banking					
10.2 I am willing to start using e-banking services in the future					
10.3 I am willing to try e-banking for my basic daily banking needs					
10.4 I am willing to change my present banking behaviour so that I can enjoy the benefits that e-banking offers					
10.5 I am willing to move to e-banking if I am assured of help from the bank					

Thank you for participating in this banking research project.

Annexure 3: Expert Group Discussion Guide

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Smuts and First Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za



Focus Group Discussion Guide

A Theoretical Framework of How the Banks Can Extend their E-Banking Systems to Include Digitally Unbanked Seniors

1. Introduction and introduction:

Welcome. Thank you for agreeing to participate in this focus group. I am interested to hear your valuable and critical opinions on the present study's findings as well as the model empirically designed as a practical roadmap on how the banks can bank digitally unbanked seniors, thus contribute to financial inclusion.

- Who and I (and introduce my note taker) and what I trying to do

2. Explanation of the process

- Has anyone here participated in a focus group before?
(Explain that focus groups are being used more in social research to gain in-depth information on the research subject).
- Why I identified you to participate

About this focus group

- ✓ I plan to learn from your insights in relation to my study's findings (positive and negative)
- ✓ Your feedback on the study's results is important because I regard you as experts on the subject
- ✓ The intention is not to try to achieve consensus, I am gathering information
- I will make a presentation of my study's findings and the developed model and thereafter we will engage the individual sections of the presentation.
- What will be done with this information (a generalized write-up report will be consolidated and be infused within my study's findings chapter. Anonymity of the individual inputs will be maintained).

Logistics

- The focus group will last for about 4 – 5 hours
- Explanation of why I am using a tape recorder
- Feel free to move around
- Can we reach a consensus about the breaks in-between the discussions?
- Where is the bathroom? Exit?

3. Ground Rules

Can we please suggest some ground rules? (I will seek to achieve the following amongst the set ground rules):

- Everyone should participate and has the right to be heard
- Information provided in the focus group must be kept confidential
- Stay with the group and please don't have side conversations
- Turn off cell phones if possible/or put them on silent mode
- Have fun and be as open and critical as possible



4. Commencement of the discussions (*Turn on Tape Recorder*)

- With the ground rules set, does anyone have a question before we get started?
- Can I please ask you to introduce yourself (*[Go around the table] your name, organization and position at work*).
- With that done, I will go into the presentation of the study. The presentation will be structured in the following format:
 - ✓ Background to the study
 - ✓ Problems
 - ✓ Aim and objectives
 - ✓ Research questions
 - ✓ Study's theoretical foundation (Theories & designed model)
 - ✓ Research method (including research process followed and data analysis)
 - ✓ Research findings
 - ✓ Structural model
 - ✓ Conclusions & recommendation
- Are there any questions in relation to the study and the research method before we focus on the research questions and the model? (*The researcher will address all the questions, use the probes to make sure that all issues are addressed and only move on when the information is becoming repetitive*).
- Now, let us move on to discuss the study's findings in relation to the individual research questions and objectives:

Questions/probes to the focus group in relation to the findings:

1. Let's start the discussions by focusing on the study's findings by looking into the findings on the involvement of customers in the co-creation of the e-banking SDLC ([Objective 1, research question 1]. *Researcher to re-iterate the objective, research question & findings*). What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
2. Now, let's move on to discuss the study's findings in relation to the question pertaining to the design of e-banking ([Objective 2, research question 2]. *Researcher to re-iterate the objective, research question & findings*). What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
3. Let us look at the findings in relation to customer's awareness and empowerment. ([Objective 3, research question 3]. *Researcher to re-iterate the objective, research question & findings*). What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of



- seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
4. Okay, can we now look at the findings in relation to factors that are important to seniors' willingness to use e-banking. ([Objective 4, research question 4]. *Researcher to re-iterate the objective, research question & findings. Objective 4 encompasses the following factors which the researcher will emphasize the individual findings for each: PEOU, PU, Trust, Cost, Attitude Security & Risk*). What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
- 4.1 *PEOU*
What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
- 4.2 *PU*
What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
- 4.3 *Trust*
What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
- 4.4 *Cost*
What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
- 4.5 *Attitude*
What are your opinions in relation to these findings? What are some of the positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?
- 4.6 *Security & Risk*
What are your opinions in relation to these findings? What are some of the



positive/negative aspects about these findings? What, in real operations terms, are your expert opinions in relation to these findings? Would you say, in your expert opinions, that the findings are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the findings on this research question and objective?

Thank you for your feedback in relation to the study's empirical findings. We will now move on to look at modeled theoretical framework that has been empirically derived from the results. I will hand out copies of the model which will discuss (*Researcher reiterates the model flow, factors and fit to data*).

5. What are your opinions in relation to the study's model? In your opinion, what are some of the positive/negative aspects about the model? What, in real operations terms, are your expert opinions in relation to the study's model? Would you say, in your expert opinions, that the findings in relation to the model are a reflection of seniors' e-banking adoption issues in practice? Do you have any additional input for the study's consideration in relation to the model?

Conclusion

We have now touched all the aspects of the study's findings. Before we conclude, is there anything that you would like to add in relation to the research and the findings?

(The researcher to thank the participants for their time)

That concludes our focus group. Thank you so much for coming and sharing your thoughts and opinions with us.

Materials and supplies for focus groups

- Sign-in sheet
- Consent forms (one copy for participants, one copy for the team)
- Name tags
- Pads & Pencils for each participant
- Focus Group Discussion Guide for Facilitator
- 1 recording device
- Laptop for transcriber (as well as notepad)
- Notepad for facilitator
- Projector for powerpoint presentation

Annexure 4: Expert Group Consent Form

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Smuts and First Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za



Informed Consent for Participation in an Academic Research Project

A Theoretical Framework of How the Banks Can Extend their E-Banking Systems to Include Digitally Unbanked Seniors

Dear Focus Group Participant

You are herewith invited to participate in a focus group discussion of the results of an academic research study conducted by Bongani Diako, a student in the Doctor of Business Leadership at UNISA's Graduate School of Business Leadership (SBL).

The purpose of the study was to investigate how the banks can use technology to devise solutions of banking the digitally unbanked seniors (elderly), whom are defined in the study as senior people that 65 years+ and are completely outside of the banking system or those only using traditional bank branches for their banking. The study aims to contribute to solutions of banking the unbanked by considering the impact on willingness to use e-banking of factors that include system/product design (features), customer empowerment with education and awareness as well as costs barriers. Thus, the study cuts across multi-disciplines that include banking technology adoption, financial inclusion/exclusion issues that incorporates customer's education and awareness, as well as banking products/services and systems design. It for this reason that I have identified you as a relevant participant/avail the study an individual with the requisite expertise to participate.

Your contribution in the focus group discussion and all the information you provide will be treated as confidential, and you will not be identified in any of the research reports emanating from this research.

Please feel free to engage the study's results that I will present as critically as you wish. The outcomes of you inputs in the study will be used for academic purposes only. I will provide you with a summary of the study's final findings on request.

Please contact any of my supervisors, Professor Sam Lubbe on 078 367 9383/sam.lubbe@gmail.com or Professor Rembrandt Klopper on 084 448 6662/Rklopper@gmail.com if you have any questions or comments regarding the study. Please sign below to indicate your willingness to participate in the study.

Yours sincerely

Bongani Diako

I,, herewith give my consent to participate in the study. I have read the letter and understand my rights with regard to participating in the research.

Respondent's signature

Date

Annexure 5: Expert Group Demographic Data Sheet

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Smuts and First Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za



Focus Group Participants' Demographic Data Sheet in an Academic Research Project

A Theoretical Framework of How the Banks Can Extend their E-Banking Systems to Include Digitally Unbanked Seniors

Dear Focus Group Participant,

Please complete below information sheet requiring your demographic data. The information collected herein is non-personal as it cannot be traced back to you and will only be used for general reporting.

Mark with X where applicable:

Gender

Female	<input type="checkbox"/>
Male	<input type="checkbox"/>

Industry I work in is:

Banking	<input type="checkbox"/>
Academic	<input type="checkbox"/>

My position at work is:

Manager	<input type="checkbox"/>
Senior manager	<input type="checkbox"/>
Executive	<input type="checkbox"/>
Lecturer	<input type="checkbox"/>
Professor	<input type="checkbox"/>

My work experience in my field is: _____

Thank you.

Annexure 6: Survey Participation Information Sheet

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Janadel & Alexandra Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za



PARTICIPANT INFORMATION SHEET

7 February 2018

A Theoretical Framework of How the Banks Can Extend their E-Banking Systems to Include Digitally Unbanked Seniors

Dear Prospective Participant

My name is Bongani Diako and I am doing research with Professor Sam Lubbe, Faculty Dean at Ritchfield Graduate Institute of Technology and Professor Rembrandt Klopper, a semi-retired interdisciplinary scholar, towards a Doctor of Business Leadership qualification at the University of South Africa. We are inviting you to participate in a study entitled *A Theoretical Framework of How the Banks Can Extend their E-Banking Systems to Include Digitally Unbanked Seniors*.

I am conducting this research to find out how the banks can use technology to devise solutions of banking the digitally unbanked seniors (elderly), whom are defined in the study as senior people that are completely outside of the banking system or those only using traditional bank branches to do their banking. Therefore, the purpose of the study is to contribute knowledge in the quest for financial inclusion solutions.

The study seeks to obtain information from senior people like you that are 60 years and over, and that is the reason you have been identified as a prospective participant. In particular, I have chosen your group of participants that are collecting the SASSA grants in cash at SASSA pay-points because you fit the study's participants' profile. The study targets senior people that are in control of the management of their financial affairs. Additionally, it is a requirement for participation in the research that you do not as yet use technology banking platforms such as Internet and Cellphone banking (digitally unbanked) or you do not participate in the formal banking system. I have obtained permission from SASSA and they have consented to my access to this cash pay-point as well as the interviews. Overall, I will be interviewing approximately 430 randomly selected participants that are collecting their SASSA grants in cash at the pay-points.

The study involves a structured survey questionnaire that will take approximately 15 to 30 minutes to conclude. The survey will take the format of an interview wherein a trained data collector will read out to you specific questions from a questionnaire in which each response that you provide will be recorded. Therefore, all you have to do is to verbally provide answers that are most applicable to you. For example, you will be asked to indicate whether you 'agree' or 'disagree' with certain statements that include the following as an example: *'As a senior, I would use e-banking if the banks involved me in its creation before it is developed'*.

Even though I have obtained consent from SASSA to conduct this research, your participation in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form.

You are free to withdraw at any time during the interview and without giving a reason. However, it is important to note that it will not be possible to withdraw from the study once your questionnaire has been completed and submitted as it will not be possible to trace your specific questionnaire in relation those of other participants.

There is no monetary or other material reward attached to your participation in this research study, either for you or SASSA. However, it is envisaged that the study's findings that will be derived



from information obtained from you and other participants will, in the long-term, contribute to finding solutions of the elderly's financial exclusion challenges.

The only inconvenience for your participating in the research study will be your time (about 15 – 30 minutes) and your participation in the interview is not expected to put you, or anyone else, in any form of risk.

What you say during the interview will remain private and confidential and used only as the study's data that will be condensed with that collected from other participants solely for the purpose of the research. I, the statistician and data collectors (whom have signed confidentiality agreements) as well as my supervisors will be the only persons having access to the study's information. Your name will not be used in the research report or any subsequent usage of the research findings in publications such as academic journals and conference papers. Only anonymous data condensed with that from other participants will be used in the event the report of the study is submitted for publication, which is likely.

Hard copies of your answers will be stored by the researcher for a period of 5 years in a locked cupboard/filing cabinet in my garage for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. At the expiry of the stipulated 5 years, hard copies of the stored data will be shredded while electronic data files will be deleted from the computer in which it is stored.

This study has received written approval from the Research Ethics Committee of the College of Economic and Management Sciences, Unisa. A copy of the approval letter can be obtained from the researcher if you so wish.

If you would like to be informed of the final research findings, please contact Mr Bongani Diako on 082 788 2219 or diakobongani2@gmail.com. You can use the same details if you want to contact the researcher about any aspect of this study.

Should you have concerns about the way in which the research has been conducted, you may contact Professor Sam Lubbe on 078 367 9383 or sam.lubbe@gmail.com or Professor Rembrandt Klopper on 084 448 6662 or Rklopper@gmail.com.

Thank you for taking time to read this information sheet and for participating in this study.

Thank you.



Bongani Diako

Annexure 7: Survey Informed Consent

Graduate School of Business Leadership, University of South Africa PO Box 392 Unisa 0003 South Africa
Cnr Smuts and First Avenue Midrand 1685 Tel: +27 11 652 0000 Fax: +27 11 652 0299
Email: sbl@unisa.ac.za Website: www.sblunisa.ac.za



Informed Consent for Participation in an Academic Research Project

A Theoretical Framework of How the Banks Can Extend their E-Banking Systems to Include Digitally Unbanked Seniors

Dear Respondent

You are herewith invited to participate in an academic research study conducted by Bongani Diako, a student in the Doctor of Business Leadership at UNISA's Graduate School of Business Leadership (SBL).

The purpose of the study is to investigate how the banks can use technology to devise solutions of banking the digitally unbanked seniors (elderly), whom are defined in the study as senior people that are 60 years and older and are completely outside of the banking system or those only using traditional bank branches for their banking. Therefore, the purpose of the study is to contribute to solutions of financial inclusion.

All your answers will be treated as confidential, and you will not be identified in any of the research reports emanating from this research.

Your participation in this study is very important to us. You may however choose not to participate and you may also withdraw from the study at any time without any negative consequences.

Please answer each questions posed to you by the data collector as honestly as possible and as best as it is applicable to you. This should not take more than 15-30 minutes of your time.

The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.

Please contact any of my supervisors Professor Sam Lubbe on 078 367 9383 or sam.lubbe@gmail.com, or Professor Rembrandt Klopper on 084 448 6662 or Rklopper@gmail.com if you have any questions or comments regarding the study. Please sign below to indicate your willingness to participate in the study.

Yours sincerely

Bongani Diako

I,, herewith give my consent to participate in the study. I have read the letter and understand my rights with regard to participating in the research.

Respondent's signature

Date

Annexure 8: SASSA Permission to Conduct Research



SASSA HOUSE
501 Prodimae Building
Cnr Steve Biko & Pretorius Str
Pretoria
0083
23 April 2018

Mr. Bongani Diako
UNISA SBL Student No: 72421010,
Cell: 082 788 2210)
UNISA Research Office

Dear Mr. Diako

Re: Permission to Conduct Doctoral Research Involving SASSA Elderly Grants Recipients

I acknowledge receipt of your letter requesting permission to conduct doctoral research involving SASSA elderly grants recipients. SASSA is a progressive Agency which promotes research that enhances knowledge and development. Please be advised that permission is granted for you and your team to undertake this study in the offices of SASSA. Please present this letter when you access SASSA offices or engage with officials.

Of importance for you as you embark on this project is that SASSA cannot decree to its officials, customers, beneficiaries and stakeholders whether or not to participate in your research study. However, information that you will obtain from SASSA officials and beneficiaries should be treated with confidentiality whether in terms of the storage of data, analysis or during publication process. It is advisable to remove identifiers such as names and geographical hints when writing up your dissertation.

Furthermore, SASSA cannot guarantee your safety as you go around its premises and does not promise you funding of your research study at any given stage.

The Monitoring and Evaluation Department at SASSA Head Office will provide you with statistical information and approved reports on your subject matter of study if requested, and if information is available. I wish to thank you for choosing SASSA to collect data for your study and SASSA would like to be furnished with electronic and printed copies of your completed dissertation.

For more information please contact Ms. Rose Nkwinka at 012 400 2362.

Kind regards,


Executive Manager: Grants Administration
Ms. Dianne Dunkerley
Date: 2018-04-24

Annexure 9: Ethics Committee Approval

Graduate School of Business Leadership, University of South Africa, PO Box 392, Unisa, 0003, South Africa
Cnr Janadel and Alexandra Avenues, Midrand, 1685, Tel: +27 11 652 0000, Fax: +27 11 652 0299
E-mail: sbl@unisa.ac.za Website: www.unisa.ac.za/sbl

SCHOOL OF BUSINESS LEADERSHIP RESEARCH ETHICS REVIEW COMMITTEE (GSBL CRERC)

21 August 2018

Ref #: 2018_SBL_DBL_008_FA
Name of applicant: Mr B Diako
Student #: 72421010

Dear Mr Diako

Decision: Ethics Approval

Student: Mr B Diako, diakobongani2@gmail.com, 012 649 6255

Supervisor: Prof S Lubbe, slubbe@richfield.ac.za, 078 3673834

Co-Supervisor: Prof R Klopper, rklopper@gmail.com, 084 446 6662

Project Title: A theoretical framework of how the banks can extend e-banking systems to include Digitally Unbanked Seniors.

Qualification: Doctor in Business Leadership (DBL)

Expiry Date: December 2019

Thank you for applying for research ethics clearance, SBL Research Ethics Review Committee reviewed your application in compliance with the Unisa Policy on Research Ethics.

**Outcome of the SBL Research Committee:
Approval is granted for the duration of the Project**

The application was reviewed in compliance with the Unisa Policy on Research Ethics by the SBL Research Ethics Review Committee on the 16/08/2018.

The proposed research may now commence with the proviso that:

- 1) The researcher/s will ensure that the research project adheres to the values and principles expressed in the UNISA Policy on Research Ethics.

- 2) Any adverse circumstance arising in the undertaking of the research project that is relevant to the ethicality of the study, as well as changes in the methodology, should be communicated in writing to the SBL Research Ethics Review Committee.
- 3) An amended application could be requested if there are substantial changes from the existing proposal, especially if those changes affect any of the study-related risks for the research participants.
- 4) The researcher will ensure that the research project adheres to any applicable national legislation, professional codes of conduct, institutional guidelines and scientific standards relevant to the specific field of study.

Kind regards,



Prof R Ramphal

Chairperson: SBL Research Ethics Committee

011 – 652 0363 or ramphrr@unisa.ac.za



Prof RT Mpofu

Executive Dean (Acting): Graduate School of Business Leadership

011- 652 0256/mpofurt@unisa.ac.za

45
years

Building leaders who go beyond



SBL
GRADUATE SCHOOL OF
BUSINESS LEADERSHIP

UNISA

Annexure 10: Expert Focus Group coordination communique

From: Bongani Diako

Sent: 26 June 2019 03:42 PM

To: 'ntshikim@sabrc.co.za' <ntshikim@sabrc.co.za>

Cc: 'ronniez@sabrc.co.za' <ronniez@sabrc.co.za>; 'Asi.Vena@resbank.co.za' <Asi.Vena@resbank.co.za>; Bongani Diako <diakobongani2@gmail.com>; 'Sibongile Khulu' <bongikhulu@gmail.com>

Subject: Focus group

Dear Ntshiki, Asivle(Bongs), Ronnie,

As discussed when we met earlier in relation to my PDH thesis focus group participation, the following refers:

1. I am required to host a focus group discussion with a group of between 7 and 10 participants.
2. The participants must have knowledge/expertise in the following areas – digital banking products (including online banking and mobile banking)/customer awareness or education in banking, banking products design and/or diffusion (adoption). Thus, I am ideally targeting managerial level upwards
3. The first week of July is perfect timing.
4. I will present the study's findings to this group and they can input and critique the findings in order to enrich the research.
5. The study's topic is: A theoretical framework on how the banks can bank digitally unbanked senior customers (the elderly)?
6. Thus, as part of the findings, the study has developed a modelled theoretical framework as well as empirical findings on its identified factors.

For your convenience, find attached participation information sheet which provides more details on the areas of research.

Thanking you in advance sir.

Kind regards

Bongani

From: Ntshiki Maluleka
Sent: Friday, 05 July 2019 10:28
To: Ronnie Zonke <RonnieZ@sabric.co.za>; Asi.Vena@resbank.co.za; Sibongile Khulu <bongikhulu@gmail.com>
Cc: Bongani Diako <diakobongani2@gmail.com>; 'Bongani.Diako@postoffice.co.za' <Bongani.Diako@postoffice.co.za>
Subject: FW: Focus group on how banks can extend E-Banking systems to include digitally unbanked seniors
Importance: High

Dear All,

I trust that you're well.

As most participants from the banking industry have been on holidays (leave) for the past few weeks, it was a challenge to pin down a date for this group discussion.

I suggest the **11th July 2019** between **10:00 -12:00** the venue will be here at SABRIC office or alternatively you can connect via **SKYPE for business**.

Please advise of your availability and suitability so I can firm-up arrangements.

Regards

Ntshiki Maluleka
Mobile: +27 (0)71 675 5774
e-mail: ntshikim@sabric.co.za
Skype: Ntshiki.Maluleka
www.facebook.com/sabricza
www.twitter.com/sabric

From: Ntshiki Maluleka [<mailto:NtshikiM@sabric.co.za>]
Sent: 08 July 2019 10:34 AM
To: Ronnie Zonke <RonnieZ@sabric.co.za>; Asi Vena <Asi.Vena@resbank.co.za>; Sibongile Khulu <bongikhulu@gmail.com>; Stephen Makhoane <StephenM@sabric.co.za>; wellington@nouvo bang.sci; Shiraz Mea <Shiraz.Mea@absa.co.za>; Willem Marais <Willem.Marais@standardbank.co.za>; Justin Fairhurst <JustinF@nedbank.co.za>; Wayne Ernest <Wayne.ernest@fnb.co.za>; Elect Nkuna <elect.nkuna@fnb.co.za>; Sobahle Thwala <Sobahle.Thwala@standardbank.co.za>
Cc: Bongani Diako <diakobongani2@gmail.com>; Bongani.Diako@postoffice.co.za
Subject: RE: Focus group on how banks can extend E-Banking systems to include digitally unbanked seniors
Importance: High

Dear recipients,

Judging from most responses received and telephonic arrangements, it has been finalised that we set the date and time as follows:

Date: 11 July 2019
Time: 13:00 – 15:00

The Skype connection is still available to all who will be able to participate (internationally and locally). A dairy schedule will follow.

Regards

Ntshiki



www.sabric.co.za
Headford Office Park, 90 Bekker Street, Midrand
Tel: 011 847 3000



Annexure 11: Professional statistician's services letter of assurance

Gill Hendry B.Sc. (Hons), M.Sc. (Wits); PhD (UKZN)
Mathematical and Statistical Services

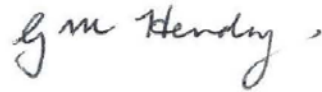
Cell: 083 300 9896
email : hendryfam@telkomsa.net

6 January 2020

Re: Assistance with statistical aspects of the study

Please be advised that I have assisted Bongani Diako (Student number 7242101), who is currently studying for a PhD in the School of Business Leadership, UNISA, with the questionnaire validation/development and data analysis for his study.

Yours sincerely



Gill Hendry (Dr)

Annexure 12: Language services provider agreement



CARISSAMNEL

COST ESTIMATE/QUOTATION

Date: 13/01/2020
Client: Bongani Diako
RE: Quote for language review and reference editing of Doctorate Thesis

Thank you for the opportunity to quote for your requirements.

Note: Please see the attached tariff list for current tariffs.

You requested a quotation for the language review and reference editing of your entire dissertation – all chapters and the reference list (excluding appendices).

Approximate number of pages: 224

Tariff per page:	R65.00
Total:	R14 560
Approximate turnaround time:	12 - 14 days

Terms & Conditions:

- The quoted figure is for the specified service only. If any additional service is required or original deadline dates/instruction details are changed, the invoice will be amended accordingly.
- On acceptance of this quote, a pro-forma invoice of 50% of the quoted amount will be compiled.
- **NB! Invoices to be paid in full within 7 days of delivery of work quoted for, unless an alternative arrangement is made and agreed upon by both parties in writing.**

Should any further information be required, please do not hesitate to contact me, either telephonically or viae-mail.

Regards,

Carissa Nel

Annexure 13: Language editor's declaration



CARISSAMNEL

23 January 2020

Acknowledgement of Language Review

To whom it may concern,

This serves to confirm that I performed the task of language review and academic editing of **Bongani Harry Diako's** (Student Number: 72421010) Doctor of Business Leadership thesis, titled: "**An Empirical Framework for Banking Digitally Unbanked Seniors**" for submission at the University of South Africa in 2020.

I, Carissa Maude Nel, obtained a degree in English (specialising in Journalism, Language Editing and English) cum laude from the University of Pretoria in 2009. My post-graduate studies include two Honours degrees in French and Visual Studies, from the same institution.

I am a seasoned freelance Language Practitioner with more than 10 years' experience, with various high-profile tertiary education clients, including the University of Pretoria, UNISA, Milpark Business School and North-West University. In addition, I am a member of the Professional Editors' Group (PEG).

Should any further particulars be required, please do not hesitate to contact me.

Carissa Nel

Copywriter | Language Practitioner | Translator

ID: 8709010240081

Home/Postal Address: 37 Mackenzie Street; Brooklyn; Pretoria; South Africa; 0181

Cell: +27 82 5917942

E-mail: carissam.nel@gmail.com