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The Impact of Digital Banking Amongst South African Consumers

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THE IMPACT OF DIGITAL BANKING AMONGST SOUTH AFRICAN CONSUMERS

APPLIED RESEARCH PROJECT

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

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ABSTRACT

In light of the constant and swift evolution of digital banking, it is imperative that consumers quickly adapt to these changes. The advancements in technology are having a significant impact on businesses' strategic objectives and business models, as they are altering consumer behavior and expectations. As a result, numerous organizations have modified their business platforms in order to enhance their competitive edge by offering proximate and efficient solutions to consumers, thus influencing their approach to conducting business.

This research aimed to elucidate the effects of digital banking on consumers and their inclination to modify their behavior, utilizing the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) as primary frameworks. The research methodology employed in an online survey, utilising a sample population of 240 respondents. The research effort was specifically focused on establishing if consumers are impacted, either positively or negatively due to technological advancements in digital banking.

The primary data suggests that a significant number of individuals aged 46 or older in South Africa are hesitant to fully embrace digital banking. On the other hand, consumers between the ages of 18 and 45 appear more inclined to shift from traditional banks to digital-focused banks, such as Tyme Bank, Discovery Bank, or Bank Zero. The limited access to the internet in South Africa may be a factor contributing to the underutilization of digital banking by consumers.

DECLARATION

I, Dhivaker Navin Mahadev Suthan, declare that this research article is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the Graduate School of Business Administration, University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.



Dhivaker Navin Mahadev Suthan

Signed at Randburg

17/10/2023

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Table of Contents

ABSTRACT 2

DECLARATION 3

ACKNOWLEDGMENTS 4

LIST OF TABLES 9

LIST OF FIGURES 10

CHAPTER 1. INTRODUCTION 12

1.1 Purpose of study 12

1.2 Background and context 12

1.3 Research problem 17

1.4 Research objective 22

1.5 Rationale 22

1.6 Delimitations of the study 23

1.7 Assumptions 24

1.8 Definition of terms 24

1.9 Report preference 25

CHAPTER 2 LITERATURE REVIEW 27

2.1 Introduction 27

2.2 Background and definition of terms 27

2.3 Empirical literature on digital technology adoption 28

2.3.1 In financial services 28

2.3.2 Banks 28
2.4 Empirical literature on digital technology adoption 29
2.4.1 Global literature 29
2.4.2 African context 29
2.4.3 South African context 29
2.5 Theoretical framework 31
2.5.1 TAM 31
2.5.2 UTAUT 36
2.5.3 Reason for the use of TAM and UTAUT 41
2.5.4 Research model illustrating the hypotheses and their influence on the intention use behaviour 42
CHAPTER 3 RESEARCH METHODOLOGY 44
3.1 Research approach and worldview 44
3.2 Research design 45
3.3 Data collection methods 45
3.4 Population and sampling 46
3.4.1 Sampling frame 46
3.4.2 Sampling method 46
3.4.3 Sample size calculation 47
3.5 Data collection procedure 47
3.6 Data collection instruments and constructs 47
3.7 Data analysis 48

3.8 Reliability and validity 49
3.9 Ethical considerations 49
CHAPTER 4 PRESENTATION OF RESULTS 51
4.1 Demographic results 51
4.2 Normality test 54
4.3 Descriptive statistics 55
4.4 Reliability and validity 57
4.4.1 Reliability coefficient for each of the constructs 57
4.4.2 Construct and Discriminant validity 58
4.5 Hypotheses testing 60
4.5.1 Inferential statistics 60
4.5.2 Multiple regression analysis 71
4.6 Hypotheses outcomes 73
CHAPTER 5 DISCUSSION OF RESULTS 75
5.1 Discussion of each of the objectives presented 75
CHAPTER 6 CONCLUSION 80
6.1 Conclusion by each objective 80
6.2 Recommendations and practical implications of the study 82
6.3 Suggestions 84
6.4 Limitations 86
References 87

LIST OF TABLES

Table 2 - 1: Summary of research hypotheses 43

Table 4 - 1: Summary of valid surveys 51

Table 4 - 2: Summary of demographic metrics 53

Table 4 - 3: Descriptive statistics 55

Table 4 - 4: Descriptive statistics (2) 56

Table 4 - 5: Reliability coefficients for various constructs 57

Table 4 - 6: Validity of utilising PCA 58

Table 4 - 7: Cronbach's Alpha test results 59

LIST OF FIGURES

Figure 1 - 1: Market dispersion of current banks in South Africa (Extracted from: Writer, S. (2022)) 14

Figure 1 - 2: South Africa total asset market share (%) Extracted from: Writer, S. (2022) 15

Figure 1 – 3: Internet access – At least one person per household. Extracted from: (Statssa, 2022). 18

Figure 1 - 4: Number of Smartphones users in South Africa (2021). Extracted from: (Statssa, 2022) .....**Error! Bookmark not defined.**

Figure 1 - 5: Percentage of smartphone users per geographical region. Extracted from: (Statssa, 2022) .....**Error! Bookmark not defined.**

Figure 2 - 1: Technology acceptance model (TAM) Extracted from: (Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. Internet Research, 14(3), 224-235) 32

Figure 2 - 2: Extracted from: (Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. Internet Research, 14(3), 224-235) 37

Figure 2 - 3: Research model illustrating the hypotheses and their influence on the intention use behaviour 42

Figure 4 - 1: Correlation between perceived usefulness and intention to adopt digital banking 61

Figure 4 - 2: Correlation between perceived ease of use and intention to adopt digital banking 62

Figure 4 - 3: Correlation between perceived ease of use and consumer trust to digital banking..... 63
Figure 4 - 4: Correlation between perceived ease of use and perceived usefulness on digital banking 64
Figure 4 - 5: Correlation between age and use behaviour of digital banking..... 65
Figure 4 - 6: Correlation between age and performance expectancy on behavioural intentions..... 66
Figure 4 - 7: Correlation between age and effort expectancy on behavioural intentions 67
Figure 4 - 8: Correlation between age and social influence on behavioural intentions 68
Figure 4 - 9: Correlation between facilitating conditions and age on use behaviour. 69
Figure 4 - 10: Correlation between voluntariness of use and social influence on behavioural intentions 70

CHAPTER 1. INTRODUCTION

1.1 Purpose of study

This quantitative study examined the impact of digital banking amongst South African consumers by employing the technological acceptance model (TAM) and the unified theory of acceptance and use of technology (UTAUT).

1.2 Background and context

In today's financial landscape, the emergence of digital banking has marked a significant transformation for consumers and financial institutions. This shift towards digital banking services has been notably impactful in South Africa, a country that has made impressive strides in technology adoption and connectivity (Berg et al., 2023). As digital banking continues to integrate into everyday routines, its impact on the financial behaviors, attitudes and experiences of South African consumers is an increasingly significant and pertinent topic.

The banking industry is experiencing a digital transformation driven by new market treats, leading traditional banks to adjust their strategies reactively and enhance their competitiveness to stay relevant (Sharma, 2023). This shift allows traditional banks to address new competition, intergrate new technologies and strategically reposition themselves to strengthen their relationships with existing customers (Sharma, 2023).

During the early stages of digital transformation in the financial sector, banks respond to change in the supply and demand of financial products and services offered through emerging digital platforms, enabling them to enhance their competitiveness (Chen et al., 2017). A common consideration for banks is the adoption of cloud computing technology, which optimizes organisational resources for a more efficient production process (Anabalagan, 2017).

The success of a bank's digital transformation largely depends on its strategic positioning withing the industry (Said & Angelita, 2020). Banks realign themselves with consumer needs, incorporating these insights into their strategic plans and digital banking systems to foster customer loyalty and enhance their digital platforms (Sheldon, 2019). This phase focuses on streamlining the digital transformation process to boost efficiency and productivity, with an emphasis on simplifying business models and digital channel structures to prioritise customer experience (Said & Angelita, 2020).

In the past two decades, the South African banking sector has rapidly evolved with the emergence of digitally-focused new entrants, who often differentiate themselves from traditional competitors by emphasizing branch networks (Camarate & Brinckhmann, 2018). Digital banking is defined as an operational model that leverages technology to deliver information to customers electronically, shifting away from traditional face-to-face interactions (Nguyen et al.,2020). This model promotes communication through electronic devices like smartphones, tablets and the internet, responding to growing customer expectation and the demand for digital innovation (Camarate & Brinckhmann, 2018).

As of December 2021, South Africa had 18 registered banks, 4 mutual banks and 5 co-operative banks ("Selected SA Banking Sector Trends - Monthly", 2022). As of March 2021; Standard Bank, FirstRand (FNB), ABSA Bank, Nedbank and Investec maintain over 90% of the market share in South Africa (Writer, 2022.). In order for the predominant market share leaders to maintain their market share in the industry, they

will need to continuously develop enhanced solutions to dovetail with their clients' needs.

Figure 1- 1 is a visual representation of the dominant financial institutes in South Africa as of March 2021.

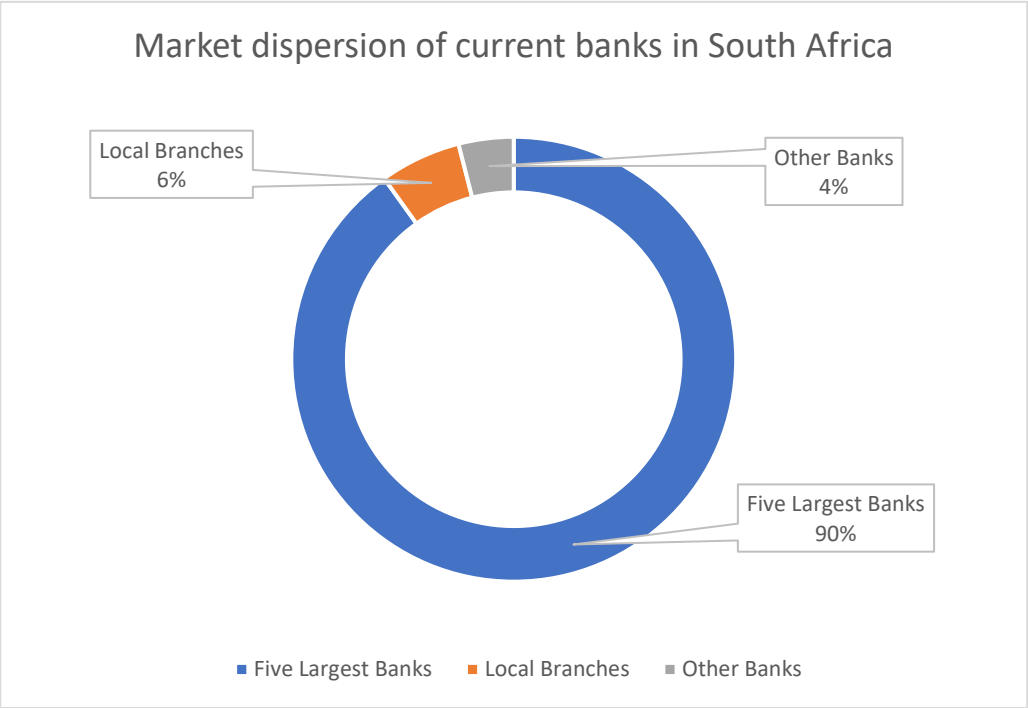


Figure 1 - 1: Market dispersion of current banks in South Africa (Extracted from: Writer, S. (2022))

Figure 1-2 presents a more detailed analysis of the asset market share among all banks in South Africa. As of March 2021, Standard Bank holds the largest asset base, accounting for 24% of the market share, followed closely by FirstRand with a 21.7% share. On the other hand, Investec ranks third with a significantly lower asset allocation of 7.6%. It is worth noting that the recent emergence of digital banks, such as Discovery Bank and Tyme Bank, poses a potential threat to traditional banks, as they have asset allocations of 0.19% and 0.03%, respectively.

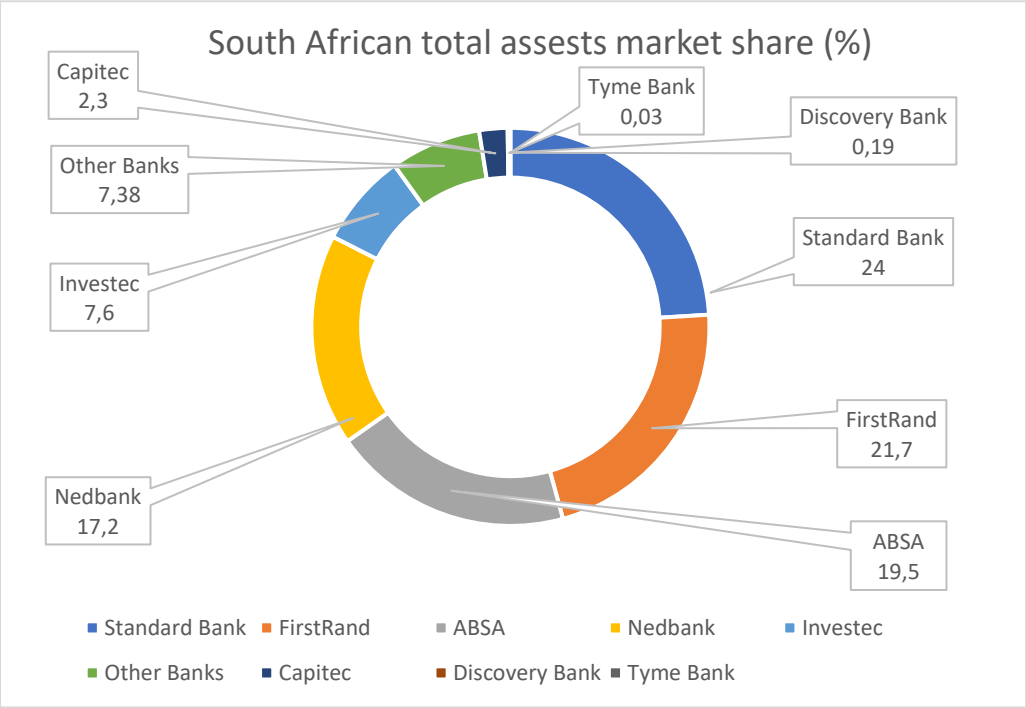


Figure 1 - 2: South Africa total asset market share (%) Extracted from: Writer, S. (2022)

According to Camarate and Brinckmann (2018), a noteworthy trend is emerging within the banking sector that may have significant implications for the five largest banks in South Africa. The potential entry of new digital banks into the industry is expected to intensify competition, as these institutions typically possess lower cost models that enable them to offer reduced administrative and service account fees. As new banks emerge in the South African market, traditional banks have been forced to improve

their technological capabilities in order to remain competitive. As a result, they have had to reposition themselves alongside their competitors (Berg et al., 2023). To remain relevant and competitive in the industry, traditional banks must ensure that their digital systems are user-friendly, easily accessible, and provide the most common functionalities for consumers to access via digital platforms at their convenience (Berg et al., 2023). Previously, individuals were required to have a bank card in order to withdraw cash from ATMs or make purchases using point-of-sale (POS) systems. However, with the advent of Cash Transfers, eWallet, Send Imali, Apple Pay, and Samsung Pay, consumers no longer require banking cards to the some extent, to make purchases or withdraw cash.

Standard Bank closed more than 100 branches across South Africa in 2018, as part of a strategic shift towards digital banking. Automated teller Machines (ATMs) now offer additional features such as issuing historical statements (statements older than three months), ordering debit cards, changing debit card pin codes, and cardless banking which includes sending and withdrawing cash via Cash Send, eWallet and Send Imali. The closure of the branch network has a significant impact on consumers because many cannot adjust to such a change in such a short period.

Therefore, consumers are forced to change their ways of banking and migrate to digital means of banking via ATM’s, Online Banking, Banking Application, unstructured supplementary service data (USSD) or WhatsApp banking. Many consumers however, struggle to adapt to these types of adjustments, and financial institutes have allocated employees to manage areas such as ATM’s or Self-service desk’s in branches.

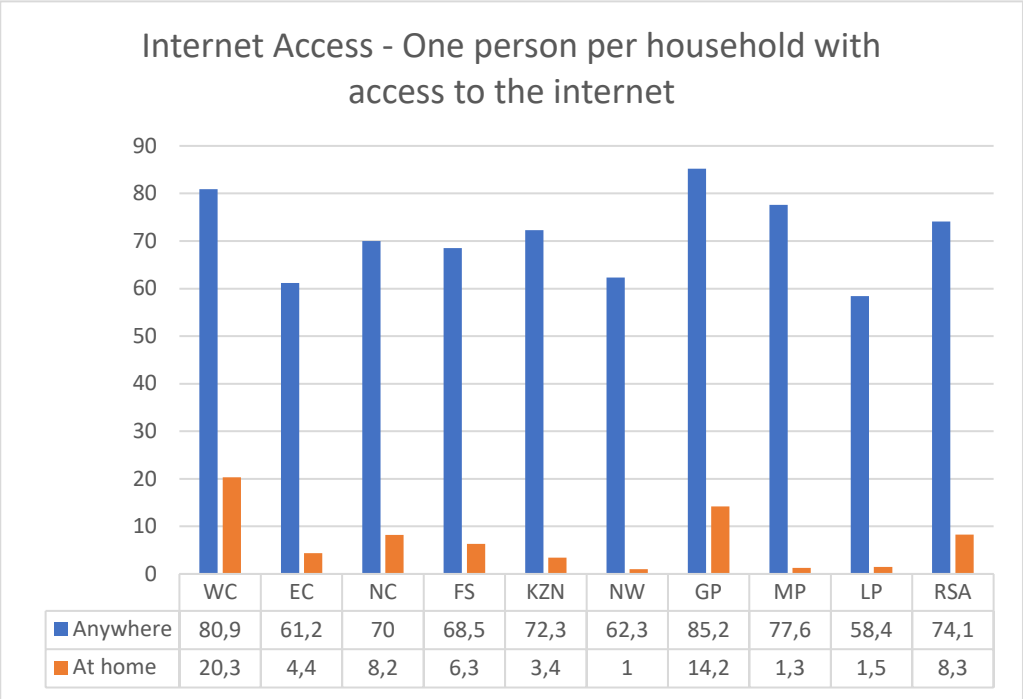
The impact of digital banking on South African consumers has been multifaceted. While it has improved access to financial services, reduced cost and increased convenience, challenges related to cybersecurity and the digital divide persist. The

ongoing evolution of the digital banking landscape will likely continue to shape the financial services industry in South Africa in the coming years.

1.3 Research problem

In South Africa, the Covid-19 pandemic has driven many consumers to adopt digital banking to meet their financial needs (Moden & Neufeld, 2022). However, it is important to recognise that the country's internet infrastructure and speed ranked 90th out of 224 countries globally as of December 2021 ("Worldwide Broadband Speed League 2021 – Cable.co.uk", 2022). As a result, a substantial portion of the South African population lacks access to the internet and digital banking services. BY January 2021, approximately 74.1% of the population had internet access or at least one individual per household had internet access ("South Africa: digital population 2021,"Statista, 2022), indicating that over 25% of the population remains with internet access.

Figure 1 - 3 is a visual representation of internet access in South Africa



	WC	EC	NC	FS	KZN	NW	GP	MP	LP	RSA
Anywhere	80,9	61,2	70	68,5	72,3	62,3	85,2	77,6	58,4	74,1
At home	20,3	4,4	8,2	6,3	3,4	1	14,2	1,3	1,5	8,3

Figure 1 - 3 Internet access – At least one person per household. Extracted from: (Statssa, 2022).

From Figure 1 - 3, South Africans have low access to internet at home (8.3%), however there is a high percentage who have access to the internet by other means, such as mobile phones, tablets or even at the workplace. This study focuses on internet access anywhere for at least one individual per household. The statistics represent the number of smartphone users from 2016 – 2021 with an estimated usage in 2022 (Statssa, 2022). There is a constantly increasing trend in the number of users of smartphones per year; however, there is a wide variation between geographical regions. In rural areas, there is a low usage of smartphone users.

In addition to the challenge of accessing the internet or smartphones needed to use digital platforms, consumers also face numerous technical issues. Utilising the internet always carries a risk of service interruptions (Mitham, 2023). These interruptions affect the stability and efficiency of completing financial transactions (Mitham, 2023). Regardless of the sophisticated and effectiveness of the technology, bank servers remain vulnerable to both intentional and accidental downtime (Mitham, 2023). Compounding these technical issues, South Africa has been experiencing load-shedding which impacts cellular towers and disrupts the ability to maintain an uninterrupted connection.

Beyond the lack of internet access and/or smart devices in South Africa, consumers encounter additional challenges. Security concerns have escalated with the increased threat of fraud in financial transactions, leaving consumers exposed to fraudsters (Mitham, 2023). The South African Reserve Bank (SARB) has identified cybercrime and associated technologies as growing threats to South Africa's banking sector, ranking the country among the top ten for cybercrime (Exchange, 2022). SARB has confirmed that these threats encompass internet and banking platforms through methods such as vishing, phishing, and remote access (Exchange, 2022).

Consumers often feel neglected when banks direct them to digital platforms for concluding their financial transactions. Meeting complex consumers needs can be challenging via digital platforms, and many consumers value the benefits of having a personal relationship with their bank (Mitham, 2023). Complex scenarios can be navigated more easily with the involvement of a banker.

The transformation of digital banking has been a significant topic of research for many years since the fourth industrial revolution, and will undoubtedly as technology rapidly

evolves. This study will therefore focuses on the key drivers which involves the impacts of digital banking amongst South African consumers, both in a positive or negative way.

Venkatesh et al., (2003) identify four main pillars contributing towards behavioural intention which determines the use intention, which are gender, age, experience and voluntariness of use. The UTAUT model posits that these pillars are the differentiating factors influencing the outcome of behavioral intention of use. The TAM describes two factors, perceived ease of use and perceived usefulness, which contribute to the behavioural intention to use. Despite these models, many consumers remain reluctant to migrate to digital banking due to a wide array of key drivers.

The problem statement has two main factors that need to be investigated; the impact of digital banking referring to digital technology and adaptation of digital banking over the past two decades and the effect that is created upon consumers either in a positive or negative way. A study conducted by Dimitrova et al., (2019) found that a majority of the participants in Sweden were concerned about using digital platforms due to the vulnerability of their financial information. Later research by Chaouali and Sauiden (2021) indicated that older bank customers prefer personal contact and engagement.

Consumers who cannot adapt to this rapid change may face significant difficulties. The banking industry has seen many new digital entrants into the market over the past five years, including banks without a branch network such as Discovery Bank, Tyme Bank and Bank Zero, whereas the more traditional banks include, First Rand, ABSA, Standard Bank and Nedbank. This study will examine whether consumers are ready and willing to adapt to new ways of banking.

Digital banking in South Africa impacts consumers both negatively and positively. Many consumers are reluctant to conduct financial transactions via digital platforms due to high levels of perceived vulnerability. Concerns about digital fraud leave consumers feeling overwhelmed and skeptical about using digital banking services.

1.4 Research objective

The following objectives were adopted to address the research problem that this study sought to resolve, and were informed by preliminary literature on the impacts of digital banking on consumers, the following objectives were adopted:

1. To examine the level of adoption of digital banking services amongst South African consumers using the TAM model extracting elements from their constructs.
2. To examine the demographic factors that influence the adoption of digital banking in South Africa.
3. To examine the challenges and barriers South African consumers face when using digital banking services, including issues related to technology literacy and access to digital infrastructure.
4. To examine South African consumers' security and privacy concerns in the context of digital banking and their impact on the adoption of digital banking.

1.5 Rationale

Guerra-Leal et al. (2021) stated that financial inclusion through digital banking has the potential to bridge gaps and provide financial services to the underserved and remote areas, thereby increasing financial inclusion and reducing inequality. South Africa has a diverse population with varying access levels to traditional banking services. Additionally, a well-functioning digital banking sector can enhance economic growth by improving the efficiency of financial transactions, reducing costs for consumers and businesses and increasing financial accessibility (Hirchenko et al., 2020).

Understanding how security and privacy concerns affect digital banking adoption is crucial in the South African context. Findings from the study can lead to improved

security measures and the development of trust-building mechanisms that benefit both consumers and service providers. Guerra-Leal et al. (2021) emphasise that technological advancements encourage investment in digital infrastructure and technology, which supports the growth of digital banking. This study highlights the importance of technological advancements and innovation in the financial industry.

As described by Maduku (2022), digital banking can significantly impact the socioeconomic fabric of South Africa. Research can provide insights into how digital banking transforms financial management, payment methods, and financial planning for individuals. The significance of the study lies in the potential to drive positive changes in financial inclusion, economic growth, technological advancements, security and socioeconomic impact. It serves as a valuable tool for shaping the future of the financial sector in South Africa.

1.6 Delimitations of the study

This study is fixated on the impact of digital banking amongst South African consumers, who can be defined as individuals or entities within South Africa that engage in the purchase, use, or consumption of goods and services. Further, the study observed at digital banking in the form of internet banking, banking applications, WhatsApp banking and automatic teller machines (ATMs). The sample size of 240 participants across South Africa completed the survey via EQ Qualtrics. The study mainly focused on individuals under 45; most respondents were in Gauteng.

1.7 Assumptions

The following assumptions were made in conducting this research and analysing the survey results:

1. All respondents have a banking account where credits and debits go through the account.
2. All respondents have access to the internet, allowing them to conduct their banking needs on a digital platform.
3. All respondents have been in a branch network to conduct their banking needs.
4. All respondents have an adequate level of knowledge required to make use of digital banking.
5. Younger respondents are more technologically inclined and as a result, are more likely to adopt digital banking.
6. All respondents have attempted to migrate to digital banking or are currently utilising digital banking.

1.8 Definition of terms

Digitisation – This is an optimal opportunity that uses digital means to ensure that tasks are completed more efficiently and effectively by optimising existing resources and processes, which can reduce cost and increase agility (Thatte & Kulkarni, 2021).

Digitalisation – This can be described as when a business takes an opportunity on their digital asset resources, currently available, to create new services that add value to consumers, resulting in differentiation, innovation and revenues (Thatte & Kulkarni, 2021).

Digital platforms – A platform that allows consumers to transact without going into a branch. These include, automatic teller machines (ATM's), Internet banking, banking applications, WhatsApp banking.

Digital banking—In digital banking, a financial institute offers consumers services that were previously only available at a physical branch. Digital banking entails digitising all traditional products, processes, and activities to serve consumers via online channels (Malyshev, 2023).

1.9 Report preference

Chapter 1: This chapter outlines the purpose and context of the study. It defines the research problem, objectives and rationale. Additionally, it details the study's delimitations and applicable assumptions and provides a list of relevant definitions used throughout the research.

Chapter 2 introduces the literature review, beginning with an overview and background definitions. It then presents empirical literature on digital technology adoption in financial services and banks, first globally, then within Africa and specifically in South Africa. The theoretical framework, including the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and the Use of Technology (UTAUT), is introduced along with the development of relevant hypotheses and the research model to be tested.

Chapter 3: This chapter details the research approach and design. It describes the data collection methods and the sampling framework used. Following this, it outlines the data collection procedures, instruments and constructs. The chapter then discusses the data analysis process, including validity and reliability tests. It concludes with the study's limitations and ethical considerations.

Chapter 4 presents the respondents' profile, including demographics and usage habits, followed by the study's results. It discusses the outcomes of the measuring scale, including the validity and reliability tests. The correlation analyses are reported next, and the results of the regression analyses are presented. Lastly, a view of the hypotheses' outcomes is provided.

Chapter 5: This chapter provides an in-depth analysis of the findings related to each construct: perceived usefulness, perceived ease of use, age behaviour and facilitating conditions are discussed. It discusses key findings, compares them to prior research and offers conclusions and suggestions for each construct.

Chapter 6: This chapter concludes the study and offers recommendations. It begins with a summary of the respondents' profiles and highlights key findings related to the study's objective. It then provides recommendations for key stakeholders and summarizes the study's potential contributions to the impact of digital banking among South African Consumers.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter reviews existing and earlier literature and provides a general overview of adoption in digital banking. In reviewing the literature, theoretical perspectives are presented, key constructs are defined, and the respective hypotheses are developed. This chapter will begin with a brief overview of empirical literature on digital technology adoption in financial services and in banks, followed by empirical literature on digital technology adoption from a global perspective, narrowing down to an African context and further to a South African context. The introduction of the theoretical framework, namely TAM and UTAUT, with the relevant hypotheses' development, and the research model will show the hypotheses that will be tested.

2.2 Background and definition of terms

This study will be based on two management frameworks that focus on the changes required from a consumer's viewpoint to adapt to the useability of digital banking. The Technological Acceptance Model (TAM), introduced by Fred Davis in 1989, is seen as one of the most influential models of technology acceptance (Aboelmaged & Gebba, 2013). This model predominantly emphasises two factors: the perceived ease of use and usefulness.

The second framework that this study will be based on is the Unified Theory of Acceptance and Use of Technology (UTAUT) introduced by Venkatesh et al. (2003), which was developed based on the TAM Model (Ahn et al., 2019). The UTAUT consist of Four main constructs: - Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions, which aim to explain the intentions of a user that uses an information system and subsequent usage behaviour.

2.3 Empirical literature on digital technology adoption

2.3.1 In financial services

Digital financial services (DFS) have the potential to bring down costs, boost speed, security, and transparency, and enable more specialised financial services that can scale up to serve the underprivileged (Pazarbasioglu et al., 2020). Low marginal costs and increased transparency define DFS. They can address both the demand-side issues, such as unstable and low incomes for the poor, a lack of ID, trust and formalities, and geographic barriers, as well as the supply-side issues, such as high operating cost and little competition (Pazarbasioglu et al., 2020).

There are over 850 million registered mobile money accounts across 90 countries, and USD $1.3 billion is transacted daily through these accounts (Pazarbasioglu et al., 2020). Sub-Saharan Africa has established itself as a mobile money leader, with 21% of the adult population having a mobile money account. Sub-Saharan Africa has also demonstrated that these accounts can be a foundation for more sophisticated financial services like lending and insurance (Pazarbasioglu et al., 2020).

2.3.2 Banks

Banks are revamping their long-term strategies to encapsulate the opportunities offered by digitisation (Sardana & Singhania, 2018). Irrespective of the demand for digital banking, traditional ‘brick and mortar’ banks need to maintain a balance of physical presence with digital presence as the aged population is reluctant due to security and confidence (Sardana & Singhania, 2018).

2.4 Empirical literature on digital technology adoption

2.4.1 Global Literature

A study conducted by Dimitrova et al. (2019) determined that the majority of the participants in Sweden were concerned about utilising their digital platforms as their financial information is vulnerable. Later on, Chaouali and Sauiden., (2021) showed that older bank customers prefer personal contact and engagement.

2.4.2 African context

The research conducted by Alexander et al. (2017) examined the progression of fintech in both Africa and Asia, concluding that while both regions demonstrate swift development, Asian banks have been able to incorporate fintech solutions for their populations successfully. In contrast, African banks have been slower in adopting this transformation. Despite obstacles such as limited electricity and ICT infrastructure, the prognosis for digital banking in Africa and Europe continues to be optimistic. The widespread implementation of digital banking services is anticipated to yield significant advantages for the financial industry in both continents (Alexander et al., 2017). However, the study conducted by Ajibade and M. Mutula (2020) highlighted these infrastructural challenges as major hindrances to the provision of banking services in Nigeria.

2.4.3 South African context

Over the past two decades, the banking industry in South Africa has undergone significant transformation as new entrants have adopted digital-focused business models. According to Camarate and Brinckhmann (2018), these new market players often do not have a traditional branch network, distinguishing themselves from more

established competitors. Nguyen et al. (2020) define digital banking as an operating model that utilises technology to transfer information from the bank to its customers rather than conducting business through face-to-face interactions. This model promotes communication through electronic devices such as smartphones, tablets, or the internet (Nguyen et al., 2020). These advances have increased customer expectations and demand for digital innovation (Camarate & Brinckhmann, 2018).

According to Camarate and Brinckmann (2018), the banking industry in South Africa is experiencing a trend that may have significant implications for the five major banks. The emergence of new digital banks threatens traditional banks, as these digital institutions have lower cost models, enabling them to offer lower admin and service account fees. This competition could potentially maximise margins for financial institutions.

2.5 Theoretical framework

2.5.1 TAM

The TAM model posits that an individual's intention to use a technological system is directly linked to behavioural intention (Yaghoubi & Bahmani, 2010). This model was originally proposed by Davis (1989), who based his theory primarily on the Theory of Reasoned Action (TRA), which was first introduced by Fishbein and Ajzen in 1975 (Masrom, 2007). According to the TRA, an individual's behaviour is determined by their behavioural intention, which is a function of their subjective attitude towards the perceived performance of the technology (Masrom, 2007).

The Technology Acceptance Model (TAM) is based on two key factors: perceived ease of use and perceived usefulness, which are crucial in predicting a user's attitude towards adopting technology. According to TAM, perceived ease of use refers to the effortlessness that a user perceives in using the technology, while perceived usefulness refers to the user's belief in the technology's ability to enhance their work routine. Understanding these factors is essential in comprehending user acceptance of digital banking in South Africa.

Figure 2 - 3: Technology acceptance model (TAM) Extracted from: (Pikkarainen et al., 2004).

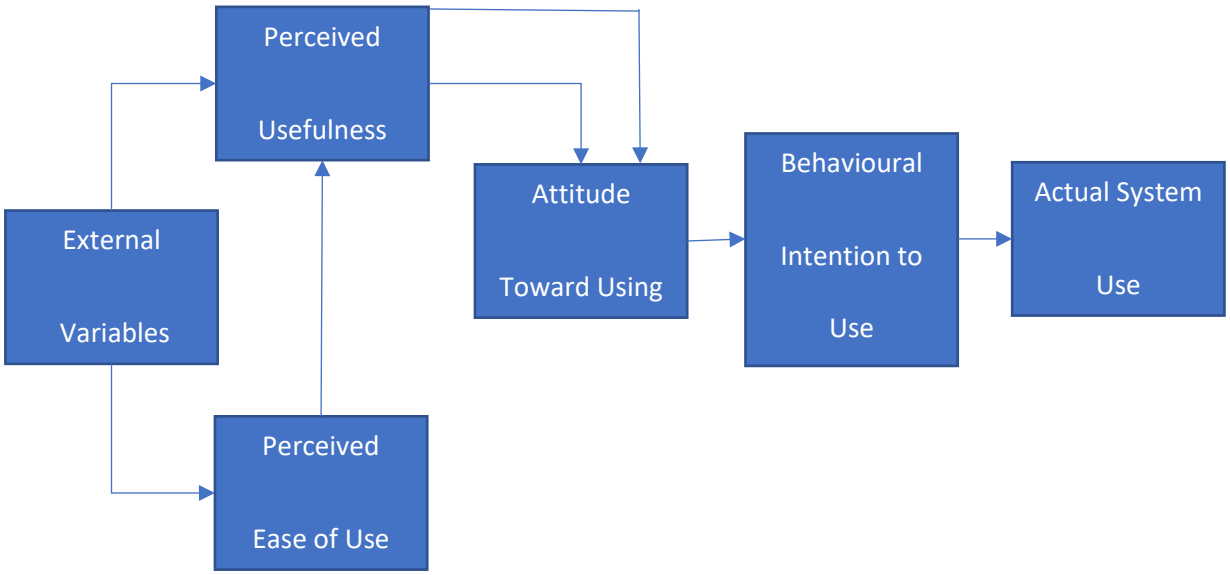


Figure 2 - 1: Technology acceptance model (TAM) Extracted from: (Pikkarainen et al., S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. Internet Research, 14(3), 224-235)

As illustrated in Figure 2-1, perceived usefulness and ease of use are two critical external variables significantly influencing consumers' attitudes towards adopting technology, as highlighted by Lai (2021). Masrom (2007) posits that perceived ease of use will likely impact perceived usefulness and attitudes towards using technology. The Technology Acceptance Model (TAM) has been proven to be a valuable tool for comprehending and explaining consumer behavior when embracing new digital technology, as demonstrated by Legris, Ingham, and Collerette (2003). Furthermore, online banking has attracted substantial academic research in the past two decades, with a particular focus on the adoption and usage of internet banking, as emphasised by Pikkarainen, Pikkarainen, Karjaluto, and Pahnila (2004).

The usefulness of digital banking, as perceived by the consumer, can be characterised to a certain extent as enhancing their ability to meet their digital banking requirements (Aboelmaged & Gebba, 2013). Similarly, the ease of use of digital platforms can be described to a certain extent as allowing the client to perform transactions effortlessly, such as resolving queries without visiting a banking environment (Aboelmaged & Gebba, 2013). Additionally, the perceived ease of use is also influenced by the user interface and the usability of the specific platform.

The perception of a digital platform's usefulness and ease of use plays a significant role in shaping the consumer's attitude towards utilising it, subsequently influencing their behavioural intention to use it. As Yaghoubi et al. (2010) have defined, behavioural intention represents the extent of a consumer's willingness to exert effort when performing specific tasks.

2.5.1.1 Description and explanation of the constructs

For this study, we will focus on the consumer's attitude to determine the impact of digital banking and whether their attitude depends on negative factors around cybercrimes. A study conducted by Yang and Yoo (2004) concluded that their study of attitude on the TAM model can influence the model’s predictability about users, further giving a better understanding of the role of attitude towards the TAM model.

Banking privacy is a great concern for consumers who use internet banking, which makes transaction security essential (Chechen et al., 2016). For a consumer to gain full acceptance, they need to feel safe, hence the change in the TAM model to incorporate trust and privacy concerns in today’s digital services. A study conducted by Hussein (2017) concluded that students' attitudes toward adopting E-learning became the most significant factor, whereas perceived usefulness and perceived ease

of use were not as important. Furthermore, Vuković et al. (2019) depicted the importance of adding a variable of privacy concerns to the model to develop a thorough and correct result and suggested that further research is necessary.

Regarding the TAM in Figure 2 - 1External variables can be described as variables that are not controlled directly by the financial institute; therefore, these would be advancements in digital banking and functionality across the country amongst competitors and demand from consumers.

2.5.1.2 Hypotheses development

- H1 – Perceived usefulness will positively impact a consumer's intention to adopt digital banking
    - Rationale – if the consumer believes that using digital banking enhances their efficiency, they are more likely to have a positive attitude toward it and intend to use it.
- H2a – The perceived ease of use will positively affect a consumer's intention to adopt digital banking.
    - Rationale – if the digital platform is easy to use, consumers are more likely to intend to use it.
- H2b – The perceived ease of use will positively affect a consumer's trust in digital banking.
    - Rationale – if the system is easy to use, it is more likely to be perceived as useful by the users.
- H2c – Perceived ease of use will positively affect the consumer's perceived usefulness of digital banking.

Rationale – If consumers intend to use the system, it is more likely that they will use it

2.5.2 UTAUT

The Unified Theory of Acceptance and Use of Technology (UTAUT) proposes that there are four essential pillars, which are Performance Expectancy, Effort Expectancy, Social Influence and Facilitation Conditions, that are the direct factors of behavioural intention and, ultimately, behavior (Venkatesh et al., 2003). UTAUT has been extensively active in technology acceptance and dispersion research as a theoretical lens by researchers showing experimental studies of user intention and behaviour (Willams et al., 2015). The UTAUT is the most well-known improvement of the TAM (Oliverira et al., 2014). The UTAUT is based on eight protuberant models in information systems, which have been empirically examined and found to outperform individual models, including the TAM.

The four core pillars mentioned earlier intend to adapt to information systems that positively affect behavioural intentions, which are influenced by age and gender (Oliverira et al., 2014). This will be a critical factor when data is collected for this study, as the elderly are more reluctant to migrate to digital platforms and prefer human interactions. Oliveira et al. (2014) stated that there is a direct link between effort efficiency and behavioural intentions, which can be a function of experience. Furthermore, the experience can be moderated by the association between social influence and behavioural intention, which, combined, then influence the actual use of information systems.

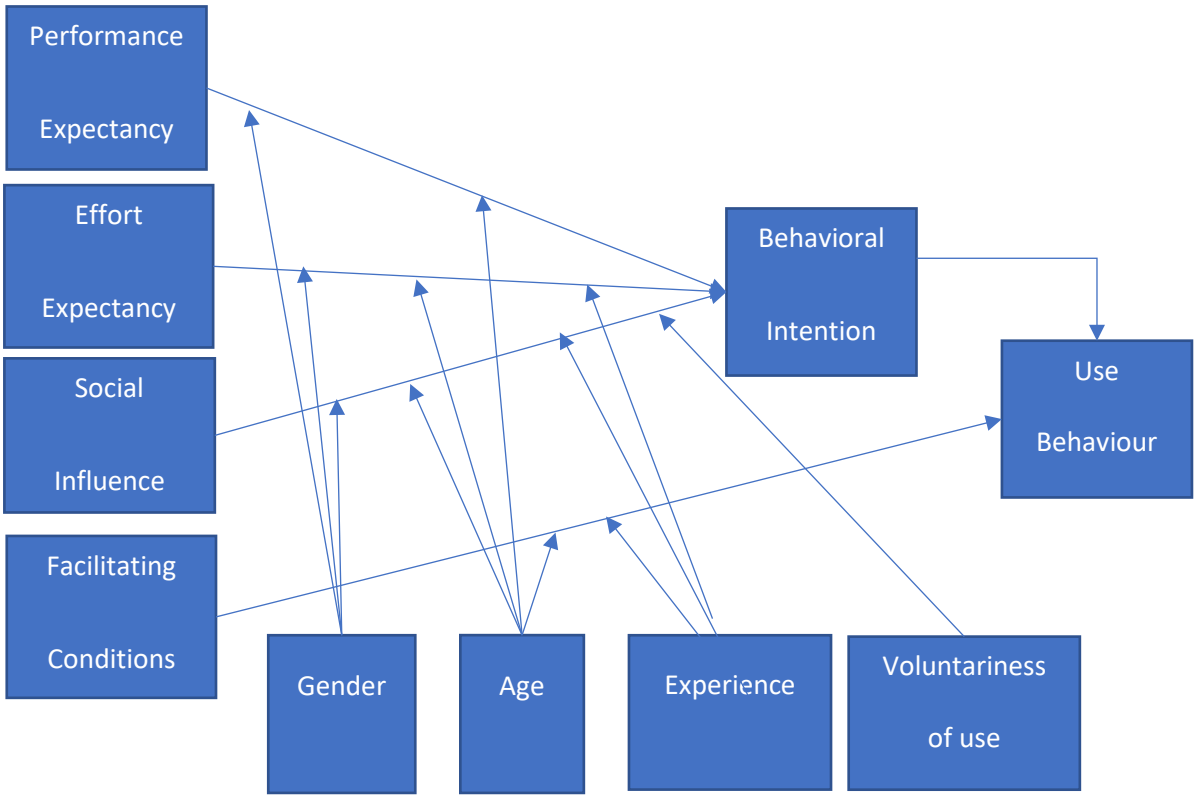


Figure 2 - 2: Extracted from: (Pikkarainen et al., S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. Internet Research, 14(3), 224-235)

As seen in Figure 2 - 2Above age is a fundamental factor that results in the behavioral intention construct. Gender affects performance expectancy, effort expectancy, and social influence. Experience affects facilitating conditions, effort expectancy, and social influence, whereas the voluntariness of use only affects social use.

2.5.2.1 Description and explanation of the constructs

Venkatesh et al., (2003) stated that the effect of performance expectancy on intentions was stronger for younger people; however, effort expectancy and social influence were more salient for the elderly. Khechine, Lakhal, Pascot and Bytha (2014) later contributed that, according to multiple research, age was a moderate link between performance expectancy and behavioural intention to use technology such that the influence of performance expectancy was more substantial for younger people.

Natarajan et al. (2017) found that consumers over 35 found mobile shopping useful and showed a higher intention to use it than consumers under 35. In the digital banking context, Joshua and Koshy (2011) found that younger individuals are more likely to utilise digital banking services than older consumers, who prefer designs that suit their lifestyles.

2.5.2.2 Hypotheses development

H3 - Age behaviour determines the use behaviour of digital banking.

Rationale—By understanding these age-related differences, banks and financial institutes can better tailor their banking services to meet the needs of different age groups, ensuring broader adoption and satisfaction among their consumer bases.

H3a – Age and performance expectancy have a positive effect on behavioural intention.

Rationale – By understanding that age and performance expectancy significantly influence behavioural intention; financial institutes can tailor their strategies to address different age groups' specific needs and perceptions. For younger consumers, emphasising innovative features and ease of use can enhance their intention to use the technology. For older consumers, demonstrating clear performance benefits and

providing support to build confidence in the technology can positively influence their behavioural intention.

H3b – Age and effort expectancy have a positive effect on behavioural intention.

Rationale – By recognising that age and effort expectancy significantly influence behavioural intention; organisations can design and implement technology solutions catering to the ease-of-use expectations of different age groups. For younger consumers, maintaining a high level of usability can reinforce their positive intention to use new technologies. For older consumers, emphasising simplicity, providing clear instructions and ensuring intuitive design can greatly enhance their willingness to adopt and use new systems. This dual focus helps maximise technology adoption across a diverse user base.

H3c – Age and social influence have a positive effect on behavioural intention.

Rationale – By understanding that both age and social influence significantly influence behavioural intention, financial institutes can tailor their strategies to leverage social dynamics effectively. Recognising and utilising these age-specific social influence mechanisms can lead to higher technology adoption rates across diverse age groups.

H4 – Facilitating conditions and age determine the use behaviour.

Rationale – By recognising that both facilitating conditions significantly influence use behaviour, organisations can tailor their strategies to support technology adoption across different age groups. Understanding and addressing these age-specific needs can lead to higher adoption and more effective use of digital banking services across a diverse user base.

H5 – Voluntariness of use and social influence positively affects behavioural intention.

Rationale – by understanding that both voluntariness of use and social influence significantly influence behavioural intention, financial institutes can design strategies that leverage these factors to enhance technology adoption. For instance, promoting the voluntary nature of the technology and highlighting endorsements from trusted social groups can increase positive behavioural intentions. Ensuring that users feel autonomous in their decision to adopt the technology while also perceiving strong social support can lead to higher adoption rates and more positive use experiences.

2.5.3 Reason for the use of TAM and UTAUT

The UTAUT has been considered an improvement over TAM due to its broader scope, incorporation of additional constructs, and better predictive power. Compared to TAM, UTAUT incorporates a broader set of factors influencing technology acceptance (Venkatesh et al., 2003). These include performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003).

The UTAUT recognises the impact of social influence on technology acceptance, acknowledging that the opinions and behaviours of others play a significant role (Venkatesh et al., 2003). Furthermore, the model introduces facilitating conditions as a construct, considering the role of organisational and environmental factors in technology adoption (Venkatesh et al., 2003). UTAUT integrates elements from various prior models, including TAM, the Theory of planned behaviour (TPB), and the Social Cognitive Theory (SCT). This integration enhances the theoretical foundation of UTAUT, as discussed by Venkatesh et al. (2003).

2.5.4 Research model illustrating the hypotheses and their influence on the intention use behaviour

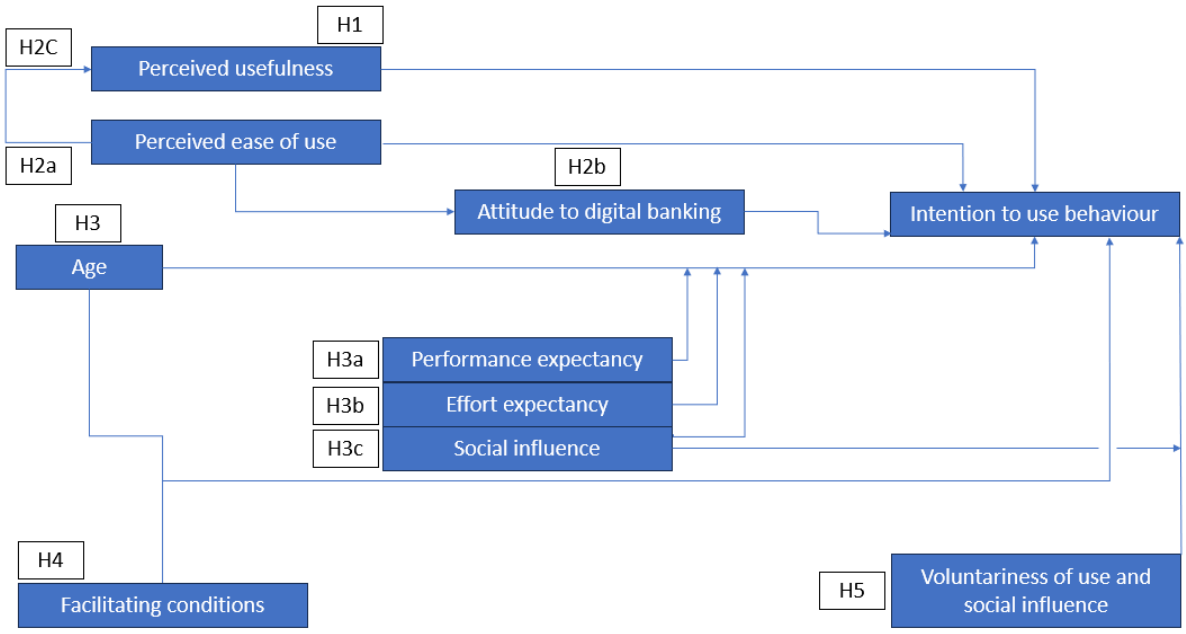


Figure 2 - 3: Research model illustrating the hypotheses and their influence on the intention use behaviour

Table 2 - 1: Summary of research hypotheses

Hypothesis	Description
H1	Perceived usefulness will positively impact a consumer's intention to adopt digital banking.
H2a	The perceived ease of use will positively affect consumers' intention to adopt digital banking.
H2b	The perceived ease of use will positively affect a consumer's trust in digital banking.
H2c	Perceived ease of use will positively affect the consumer's perceived usefulness of digital banking.
H3	Age behaviour determines the behaviour of digital banking users.
H3a	Age and performance expectancy have a positive effect on behavioural intention.
H3b	Age and effort expectancy have a positive effect on behavioural intention
H3c	Age and social influence have a positive effect on behavioural intention.
H4	Facilitating conditions and age determine the use behaviour.
H5	Voluntariness of use and social influence positively affects behavioural intention.

CHAPTER 3 RESEARCH METHODOLOGY

This study employs a particular research approach and design, which is detailed along with the study's design. The data collection methods and process are described, including the sampling framework and instruments and constructs employed. Subsequently, the data analysis procedures and the validity and reliability tests conducted on the sample are provided. Finally, the chapter addresses the research limitations and any considerations necessary to ensure ethical conduct.

3.1 Research approach and worldview

The study sought to comprehend the impact of digital banking amongst South African consumers, making it descriptive. As such, a quantitative research methodology has been implemented. This type of research is suitable as it addresses the concepts of dependent and independent variables (Whatson, 2015). Furthermore, this delves into the concept of measurement and the associated issues in terms of validity, reliability and errors (Whatson, 2015). If the research problem requires identifying factors which impact a result or understanding predictors of outcomes, then a quantitative research design is the best approach (Creswell, 2014).

The underlying values of the quantitative methodology include objectivity, neutrality, generalisability and large sample sizes (Leavy, 2017). The main drawback of the quantitative approach is that the reliability of the data is dependent on the quality of answers and on the structure of the survey and does not capture emotions, behaviour and change of emotions of respondents (Queiros et al., 2017).

3.2 Research design

The survey was distributed to participants all at once rather than multiple times to measure change over time, it can be classified as a non-experimental, cross-sectional survey (Leavy, 2017). This type of study is beneficial to the researcher as there is no concern for respondents pulling out of the study, as is usually the case with longitudinal studies, where the researcher needs to administer the survey at multiple points in time (Leavy, 2017). Furthermore, the advantage of a quantitative study, is that distribution of surveys to respondents, results in rapid turnaround for data collection (Creswell, 2014). Additional benefits include cost effectiveness and a larger sample size (Creswell, 2014).

The survey design was chosen for this study because it is the most commonly used in quantitative approaches for determining individuals' attitude, drivers and behaviours (Leavy, 2017). This is especially pertinent given that the study's aim is to determine the impact of digital banking amongst South African consumers.

3.3 Data collection methods

An online survey was created on Qualtrics which was distributed to respondents via social media distribution tools. With the advent of social media, further distribution of the survey was easily facilitated by utilising the initial respondents' social media network. This survey comprised of multiple questions and other prompts with the aim of gathering critical statistics for analyses. All raw data that was collated from Qualtrics, and exported to Microsoft Excel and IBM SPSS in which the descriptive statistics were analysed and corresponding visuals attained.

3.4 Population and sampling

The target population for this study was aimed for respondents from South African citizens who had access to their own banking account. These included consumers from all demographics, and who likely had access to digital banking. Consumers with access to digital banking and basic knowledge of digital banking were more likely to adopt digital banking.

3.4.1 Sampling frame

One aspect of research design that investigators must consider as they plan their study is sample size (Burmeister & Aitken, 2012). Accurately calculating the required sample size is essential for obtaining statistically significant results, as well as for ensuring the effective and efficient use of research resources (Burmeister et al., 2012). In this study, the sample frame encompasses the entire population of 269 respondents.

3.4.2 Sampling method

The sample method that would be used is probability sampling where every member of the population has a chance of being chosen. It is primarily employed in quantitative research (Cumming, 2010). Probability sampling techniques are the best options for producing results that are representative of the entire population (Cumming, 2010). The type of probability sampling that was used is simple random sampling where every respondent of the population had an equal chance of being selected.

3.4.3 Sample size calculation

The sample size is critical in determining statistical power and generalisability of findings (Hair et al., 2013). Hair et al. (2013) stated that the ideal observation ratio should never fall less than 5:1, and the desired level is between 15 and 20 observations for each independent variable. For the purpose of this study, a confidence level of 99% and a margin of error of 5% will be used to determine the ideal sample size.

$$\text{Sample size} = \frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

Equation 1

where: N=population, e=Margin of error, z=Z-score and P=population

With a total population of 269 respondents, the ideal sample size is determined to be 192. However, this study utilised a sample size of 240, significantly surpassing the threshold established by Hair et al. (2013).

3.5 Data collection procedure

Data was collected via an online survey, which is the primary data collection tool in survey research (Leavy, 2017). Once respondents had completed their survey, the data was exported to IBM SPSS where the results were collated and analysed.

3.6 Data collection instruments and constructs

The research instrument used in this study was a self-administered web-based online survey administered through the Qualtrics online survey tool. The questionnaire comprised of thirty questions divided into two sections. The first section gathered demographic information pertinent to the study, and the second section included several questions organised around the constructs discussed in the literature review.

The scales were adapted from the literature review research (Yadav et al., 2016), and the second part of the questionnaire used a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The instrument was assembled from components from various studies depending on the constructs being measured. As a result, the original reliability and validity of the instruments were no longer valid, and these variables had to be re-tested (Creswell, 2014).

A cover letter informed participants about the purpose of the study, what would be done with their data and their rights. The research instrument was designed in such a way that a participant could not proceed to the next question, unless the previous question was answered correctly; the goal was to reduce the number of questionnaires with missing data. Participants were on the verge of dropping because they refused to answer certain questions. The survey was tested before it was distributed to ensure that no problems arose after it was made available.

3.7 Data analysis

The respondent profile, which was the first section of the questionnaire, was analysed using descriptive statistics. Graphs and tables were used to display the frequencies for variables such as participant age, gender, highest level of education and so on. Inferential statistics were used to analyse the second part of the questionnaire.

The two programmes that will be utilised in analysing and washing the raw data will be IBM SPSS Statistics 27 and Microsoft Excel. The advantage of utilising IBM SPSS was that one can actually find missing values on a questionnaire if a respondent unintentionally omitted an answer, which is based on the rest of respondents answers to prevent skewing the data. The ability to forecast using SPSS will assist in determining and predict upcoming trends within the online banking sector by using a

relatively small sample size. A series on variance, covariance and ANOVA testing will be done in terms of age groups and actual users of digital banking.

3.8 Reliability and validity

Reliability relates to the consistency of a measure received from the participants (Surucu & Makajci, 2020). Even though, it is not possible to give the exact calculation of reliability, an estimate can be achieved by different measures (Surucu et al., 2020). Field (2017) proposes that a Cronbach alpha that ranges between 0.7 and 0.8 are considered an adequate rating. Therefore, the aim was to attain a rating greater than 0.7 for the chosen constructs to be deemed an acceptable test sample and represent a reasonable level of internal consistency for this study.

Validity can be described as the extent to which a concept is accurately measured in a quantitative study (Surucu et al., 2020). It refers to how well a set of measurements represents the study's concept's; it is concerned with how well the concept is defined by its measures (Surucu et al., 2020). This was especially important to evaluate because the questionnaire contained multiple scales that measured various constructs. The items used were drawn from credible field studies and had previously been validated. Nonetheless, the validity was retested because some of the items were modified to fit the current study.

3.9 Ethical considerations

Ethical clearance was sought from the WBS ethics committee before any data collection began. In addition, the following ethical principles are applied in the study.

The participant was fully informed about the research being conducted as they were required to be aware of the reasons for the study, along with the findings and how that information was used. The reason why this would be utilised was that the participants

would be able to make an informed decision as to whether they would participate in the study or not. Participants were able to participate in the study freely and were not forced to participate, and any respondent could withdraw from participation at any given time. The study has ensured that the research process does not cause any harm, physical or psychological, in any way, unintended or otherwise. The study does not include any form of stress, pain, anxiety or an invasion of privacy, unintended or otherwise.

The questions that were used in the study do not require the personal information to reveal the identity of individuals of the participants as per applicable in-country legislation. All data received from this study will remain in the author's possession and will only be accessible via a protective password. All participants remain unknown to the researcher, and the study will be anonymous. An acknowledgement before taking the survey stated that participants needed to be 18 years or older to participate in the study.

CHAPTER 4 PRESENTATION OF RESULTS

Chapter 3 explored the research methodology and design components in detail. This chapter commenced with an outline of the respondent's profiles, including their demographics and usage habits. Subsequently, the results were presented, encompassing the measuring scale's outcomes, such as the findings of the validity and reliability tests. After this, the correlation analyses were reported, followed by the presentation of the results of the regression analyses. Lastly, a perspective on the outcomes of the hypotheses was provided. The language used in this rephrased version is formal and academic.

The completion rate of the 280 distributed surveys was 96.07%, resulting in 269 valid surveys. A randomised sample of 240 of the 269 valid surveys was used for this study.

Table 4- 1: Summary of valid surveys

Responses	Frequency	Percentage
Incomplete Surveys	11	3.93%
Completed Surveys	269	96.07%
Total	280	100%

4.1 Demographic results

A total of 280 questionnaires were distributed electronically via Weblink using Qualtrics. The randomised sample is 240 and includes individuals aged 18 to 60 and above, with diverse gender, race, and employment status. The reason is to compare consumers of different age categories and the usage of digital channels to conduct their digital banking needs. The significant reason for the target age category was to compare the adaptability between different age groups to digital banking.

The analysis below is based on the sample size of 240 respondents who have fully completed the survey. Of the respondents, 140 (58%) were female, and the remaining 100 (42%) were male. Most respondents aged between 31-45 with 115 (48%). Age categories 18-30 and 46 -60 respondents represented 35% (83) and 31 (13%), respectively. 50% (120) of the respondents were based in Gauteng, followed by KwaZulu-Natal with 40% (96). 87% (209) of the respondents were employed full-time while the remaining 13% (31) were not employed when the survey was conducted. Table 4- 2 illustrates a summary of the demographic metrics for the valid responses received.

Table 4- 2: Summary of demographic metrics

Demographic	Category	Frequency	Percentage
Age	18 – 30	83	35%
	31 – 45	115	48%
	46 – 60	31	13%
	61 - Over	11	5%
TOTAL		240	100%
Gender	Male	100	42%
	Female	140	58%
TOTAL		240	100%
Geographic Location	Eastern Cape	1	0.42%
	Free State	4	1.67%
	Gauteng	120	50%
	KwaZulu – Natal	96	40%
	Limpopo	2	0.84%
	Mpumalanga	1	0.42%
	Northern Cape	2	0.84%
	North West	11	4.58%
	Western Cape	3	1.25%
TOTAL		240	100%
Employment status	Employed	209	87%
	Not employed	31	13%
TOTAL		240	100%

4.2 Normality test

The Kolmogorov-Smirnov test is a statistical test that determines whether a sample belongs to a particular probability distribution. The Kolmogorov-Smirnov test is frequently used in normality testing to determine whether a sample has a normal distribution. This statistic test is based on the maximum difference between the sample data's cumulative distribution function (CDF) and the expected distributions (CDF). The greater the difference, the more evidence there is that the sample does not come from a normal distribution.

Table 4- 3 Kolmogorov-Smirnov Analysis

Parameter	**Value**
H0	Sample follows given distribution
Ha	Sample does not follow given distribution
K-S Statistic (D)	0.12
P-value of test (p)	0.9938
P>0.05α	Accept H0

In Table 4- 3 A K-S statistic of 0.12 suggests that there is some discrepancy between the sample's empirical distribution and the theoretical distribution. However, the significance of this discrepancy would be better assessed by examining the associated p-value and considering the specific context of the analysis.

4.3 Descriptive statistics

Table 4- 4: Descriptive statistics

Class	Frequency	Mid-value	*f.x*	*cf*
18-30	83	24	1992	83
31-45	115	38	4370	198
46-60	31	53	1643	229
61 and Over	11	80.5	885.5	240
	N=240		$\sum f \cdot x = 8890.5$	

Table 4- 3, above, is based on grouped data whereby the mid-point of each group had to be determined. The mean age of the respondents was 37 years, with the median and mode being 35 and 32 years, respectively. The sample variance of 178.7168 indicates a moderate to high variability amongst the data points. The larger variance suggests that the data points are more spread out from the mean, resulting in individual observations in the sample and can deviate significantly from the average.

The sample variance is sensitive to outliers, and the presence of extreme values may influence its interpretation. Additionally, comparing the variance to other descriptive statistics is often helpful.

Table 4- 5: Descriptive statistics (2)

Mean	37.0438
Standard Deviation	13.3685
Median	35.3261
Mode	31.8908
Sample Variance	178.7168
Kurtosis	-3.1704
Skewness	0.2257

From Table 4- 4, a kurtosis of -3.1704 indicates that the distribution of the data is platykurtic. Platykurtic distributions have tails that are lighter or thinner than the tails of a normal distribution. The probability density is spread out more widely than in a normal distribution. The skewness measures the asymmetry of a distribution, and a positive skewness indicates that the distribution's right tail is longer or fatter than the left tail.

Therefore, a skewness of 0.2257 suggests a slightly right-skewed distribution, but the skewness is relatively close to zero, indicating that the asymmetry is not very pronounced. The standard deviation of 13.3685 indicates high variability or dispersion in the set of values, and in this sample, the standard deviation implies a moderate amount of variability in the dataset.

4.4 Reliability and validity

Reliability and validity are two fundamental concepts in the field of research and measurement that play a crucial role in ensuring the accuracy and credibility of study outcome.

4.4.1 Reliability coefficient for each of the constructs

Reliability is a crucial aspect in the field of measurement and assessment, aiming to ensure consistency and dependability of the data collected. The reliability coefficient serves as a quantitative indicator that assesses the stability and precision of a measurement instrument or tool. The reliability coefficient is a numeric representation ranging from 0 to 1 whereby a coefficient closer to 1 indicates a high reliability, whereas on the other hand, a coefficient closer to 0 signifies a low reliability.

Table 4- 5Below are the reliability coefficients for the study's constructs. Voluntariness of use has a relatively low coefficient of 0.489, which indicates lower reliability compared to the remaining constructs. Perceived usefulness has the highest coefficient of 0.827, which signifies high reliability.

Table 4- 6: Reliability coefficients for various constructs

Constructs	Reliability coefficient
Perceived usefulness (PU)	0.827
Perceived ease of use (PEOU)	0.746
Age behaviour (AB)	0.812
Age and performance expectancy (AAPE)	0.736
Age and effort expectancy (AAEE)	0.629
Age and social influence (AASI)	0.714
Facilitating conditions (FC)	0.680

Voluntariness of use (VOU)	0.489

4.4.2 Construct and Discriminant Validity

A principal component analysis (PCA) was used to determine the validity of the study. An initial PCA was run on all 10 items in the research model; however, two items loaded highly (above 0.7) on the same component, and there was no intention to measure the same constructs. The two dependent variables that were highly loaded were the perceived ease of use (PEOU) for consumer intention and the age and performance expectancy (AAPE) for behavioural intention.

After the initial PCA was conducted, a second PCA was conducted where a further 2 items were eliminated as the items had cross-loadings of above 0.4 on different components, therefore failing the uni-dimensionality test. Age and social influence (AASI) and voluntariness of use (VOU) had values over 0.4. A third PCA test was conducted and a stable pattern emerged. Table 4- 6, below, provides a summary of the items that were deleted.

Table 4- 7: Validity of utilising PCA

Item Number	Reason for elimination
PEOU1	Loaded heavily on a component that was not designed to be measured, component 6
AAPE1	Loaded heavily on a component that was not designed to be measured on component 8
AASI3	Cross loading was high (above 0.4) on two different components. Component 2 and 6.

VOU	Cross loading was high (above 0.4) on two different components. Components 6 and 8.

To validate the reliability of the survey, a test of Cronbach's Alpha was conducted to measure the internal consistency of the population sample. This measures how closely the responses are by measuring the variation between them. This study included five different Cronbach's Alpha tests, owing to the design of survey questions and their respective variables as illustrated by Table 4- 7.

Table 4- 8: Cronbach's Alpha test results

Construct	Cronbach's Alpha
Perceived usefulness	0.94721
Perceived ease of use	0.76832
Age behaviour	0.71192
Facilitating conditions	0.87936
Voluntariness of use	0.835097

Perceived usefulness obtains a Cronbach's Alpha of 0.94721, which is relatively high and suggests strong internal consistency among the constructs in the scale. In practical terms, it indicates that perceived usefulness and digital banking are highly correlated, suggesting that they measure the same underlying construct or trait.

Researchers and practitioners often consider a Cronbach's alpha above 0.7 acceptable for most purposes, and values above 0.80 are generally considered very good. However, the Cronbach's Alpha for the preference of digital banking is 0.71192,

which is indicative that the study had moderate to good internal consistency and falls within the acceptable range but not exceptionally high range.

4.5 Hypotheses testing

Hypothesis testing will evaluate each construct based on inferential statistics, correlations and regressions between the variables. The sample data will be used to determine whether there is enough evidence to either support or reject the null hypothesis

4.5.1 Inferential statistics

The results from the correlations will be presented for each of the hypotheses

H1 – Perceived usefulness will positively impact a consumer's intention to adopt digital banking.

The correlation between perceived usefulness and intention to use is statistically significant at a significance level of 0.01. according to the findings, the correlation coefficient is 0.6629, and the p-value is 0.001. This indicates that the two variables have a strong positive correlation. As a result, this finding supports H1, which states that the perceived usefulness will have a positive impact on a consumer's intention to adopt digital banking as illustrated in Figure 4 - 1.

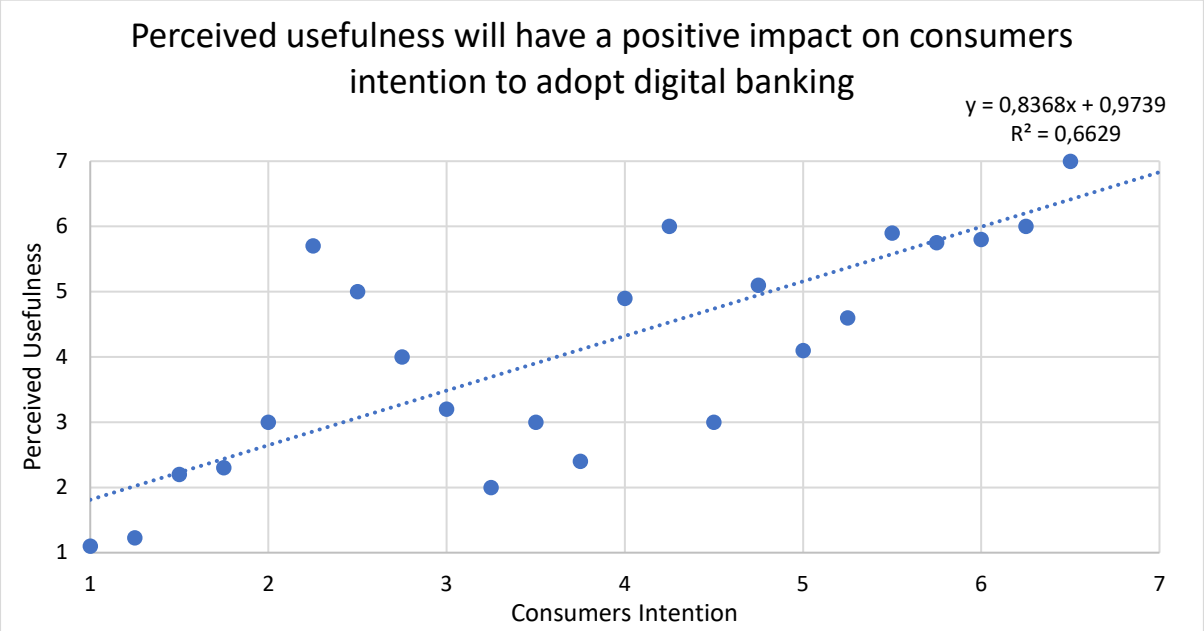


Figure 4 - 1: Correlation between perceived usefulness and intention to adopt digital banking

H2a – The perceived ease of use will positively affect a consumer's intention to adopt digital banking.

At a significance level of 0.01, the relationship between perceived ease of use and consumer intention to adopt digital banking is statistically significant. The coefficient is 0.4066 and the p-value is 0.001. this indicates that the two variables have a strong positive correlation. As a result, as illustrated by Figure 4 - 2 This finding supports H2a's hypothesis that the perceived ease of use will positively affect a consumer's intention to adopt digital banking.

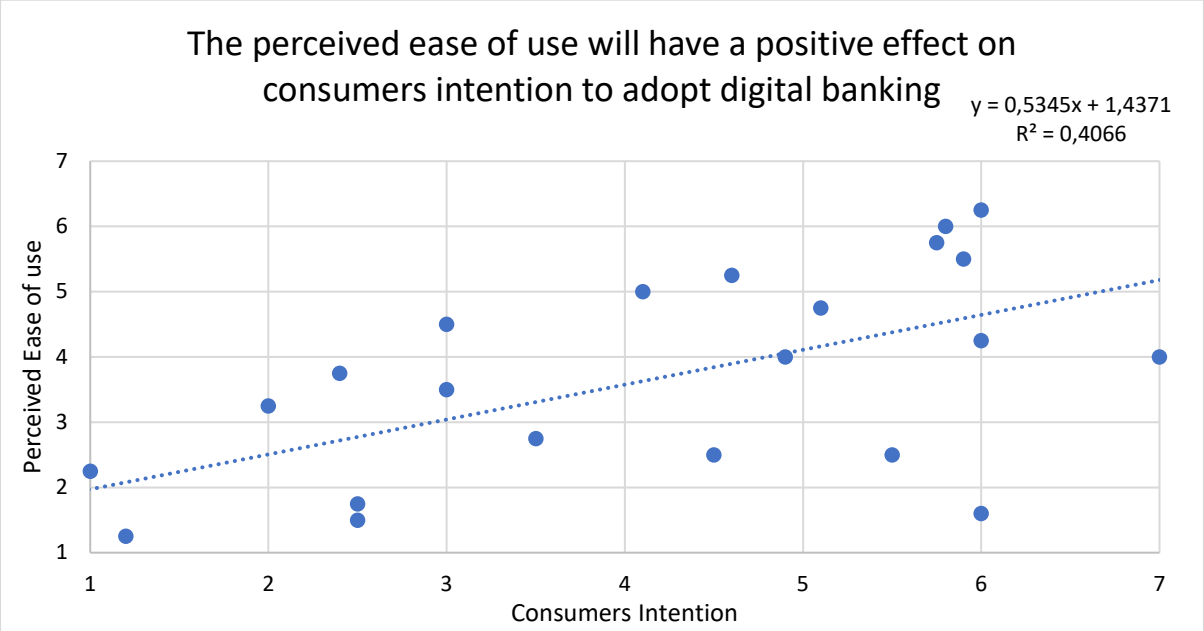


Figure 4 - 2: Correlation between perceived ease of use and intention to adopt digital banking

H2b – The perceived ease of use will positively affect a consumer's trust to digital banking.

At a significance level of 0.01, the relationship between perceived ease of use and consumer trust in adopting digital banking is statistically significant. The coefficient of correlation is 0.516, and the p-value is 0.001. This indicates that the two variables have a strong positive correlation. As a result, this finding supports H2b. As shown in Figure 4 - 3, perceived ease of use influences consumer trust in digital banking.

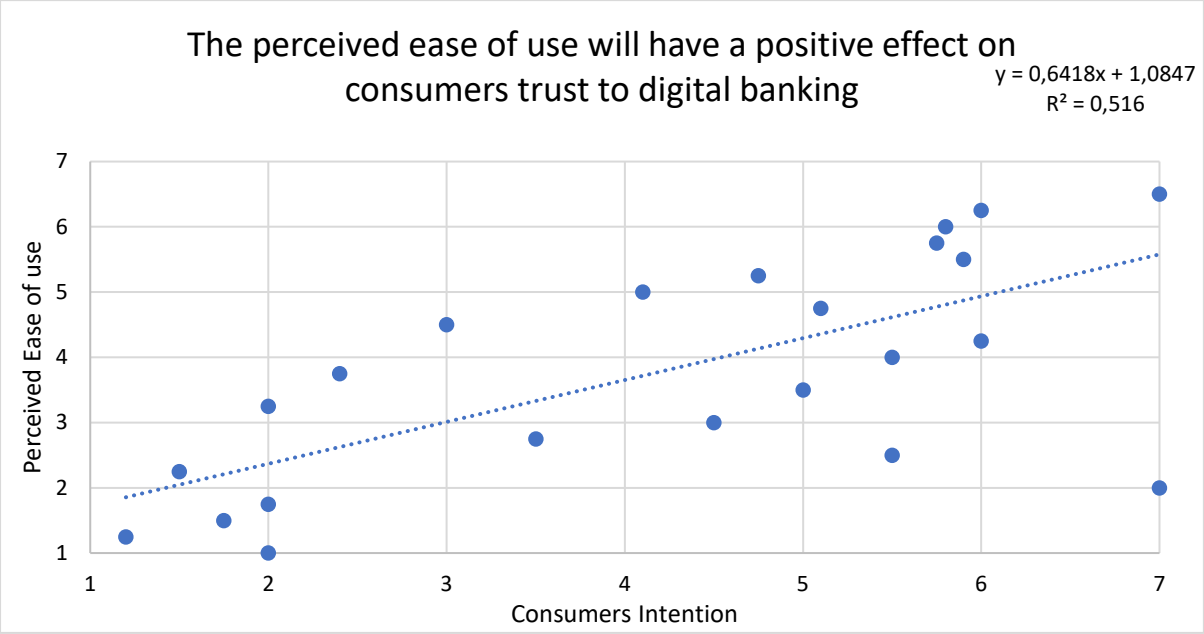


Figure 4 - 3: Correlation between perceived ease of use and consumer trust to digital banking

H2c – Perceived ease of use will positively affect the consumer's perceived usefulness of digital banking.

At a significance of 0.01, the relationship between the perceived usefulness of digital banking is statistically significant. The coefficient of correlation is 0.6032, and the p-value is 0.001. This indicates that the two variables have a strong positive correlation. As a result, as illustrated in Figure 4 - 4This finding supports H2c, which states that the perceived ease of use will positively affect consumers' perceived usefulness of digital banking.

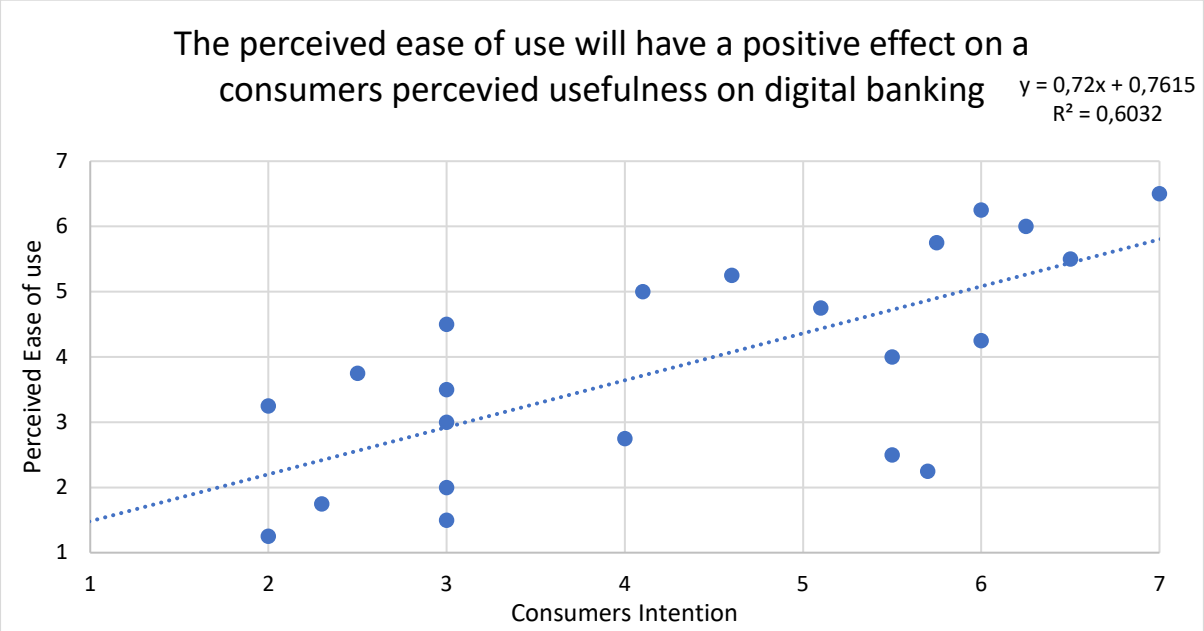


Figure 4 - 4: Correlation between perceived ease of use and perceived usefulness on digital banking

H3 – Age behaviour determines the use behaviour of digital banking

At a significance level of 0.01, the relationship between age and use behaviour is statistically significant. The correlation coefficient is 0.6903, and the p-value is 0.001, according to the results. This indicates that the two variables have a strong positive correlation. As a result, this finding supports H3, which states that age behaviour influences digital banking usage as illustrated in Figure 4 - 5.

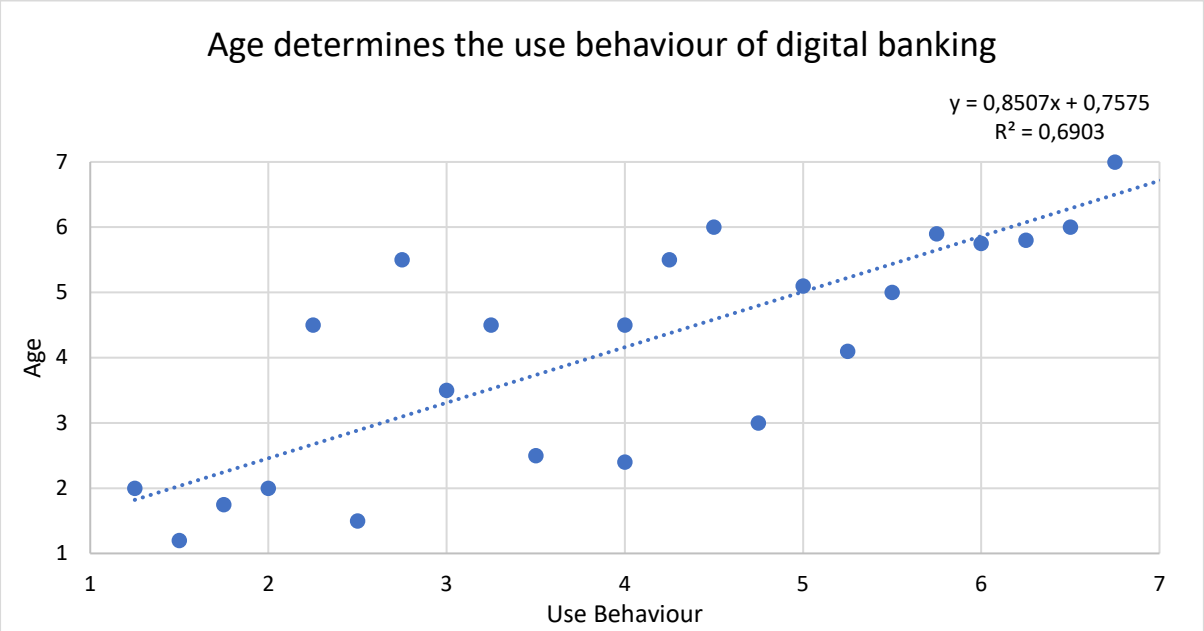


Figure 4 - 5: Correlation between age and use behaviour of digital banking

H3a – Age and performance expectancy have a positive effect on behavioural intention

At a significance level of 0.02, the relationship between age and performance expectancy on behavioural intention is statistically significant. The coefficient of correlation is 0.4404, and the p-value is 0.001. This indicates that the two variables have a strong positive correlation. As a result, as illustrated in Figure 4 - 6, this finding supports H3a, which states that, and performance expectancy have a positive effect on behavioural intention.

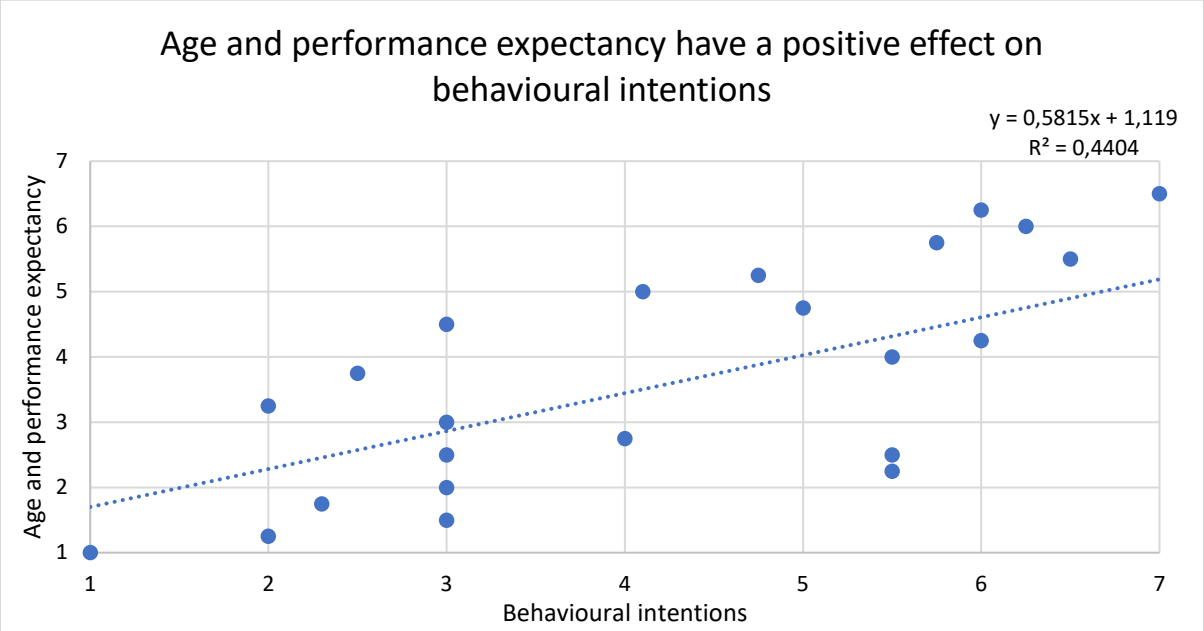


Figure 4 - 6: Correlation between age and performance expectancy on behavioural intentions

H3b – Age and effort expectancy have a positive effect on behavioural intention

At a significance level of 0.01, the relationship between age and effort expectancy on behavioural intention is statistically significant. The coefficient of correlation is 0.2073, and the p-value is 0.001. this indicates that the two variables have a positive relationship. As a result, this finding supports H3c, which states that age behaviours influence digital banking usage, as illustrated in Figure 4 - 7.

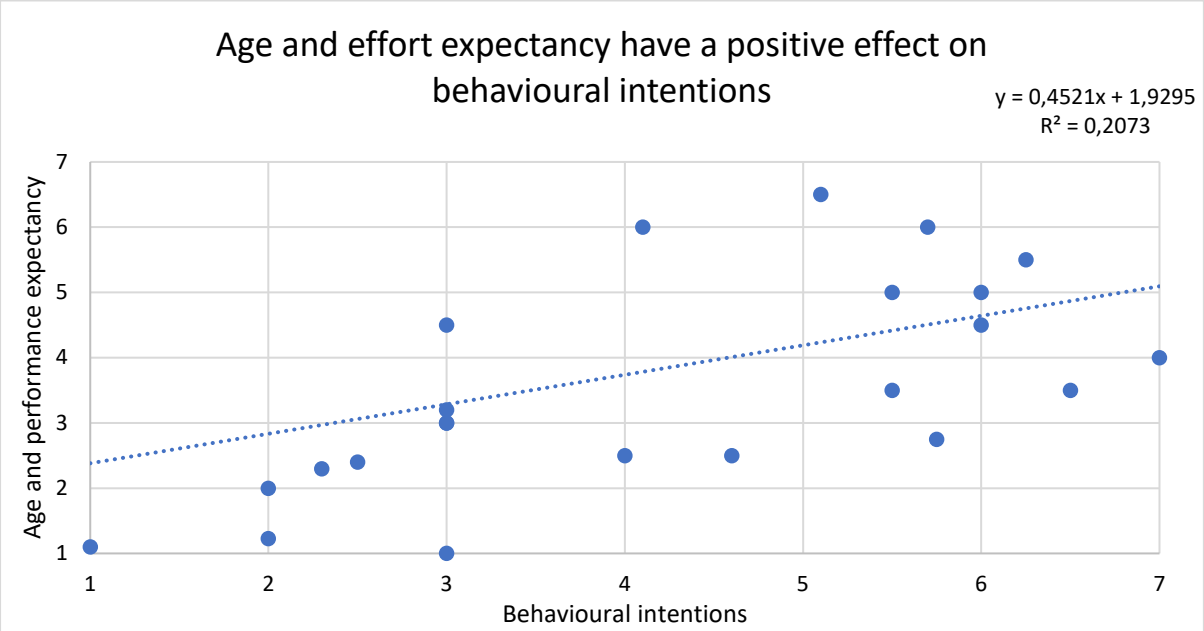


Figure 4 - 7: Correlation between age and effort expectancy on behavioural intentions

H3c – Age and social influences have a positive effect on behavioural intentions

At a significance level of 0.01, the relationship between age and social influence on behavioural intention is statistically significant. The correlation coefficient is 0.3764, and the p-value is 0.001, according to the results. This indicates that the two variables have a positive relationship. As a result, as illustrated in Figure 4 - 8, this finding supports H3c which states that age and social influence have a positive effect on behavioural intentions.

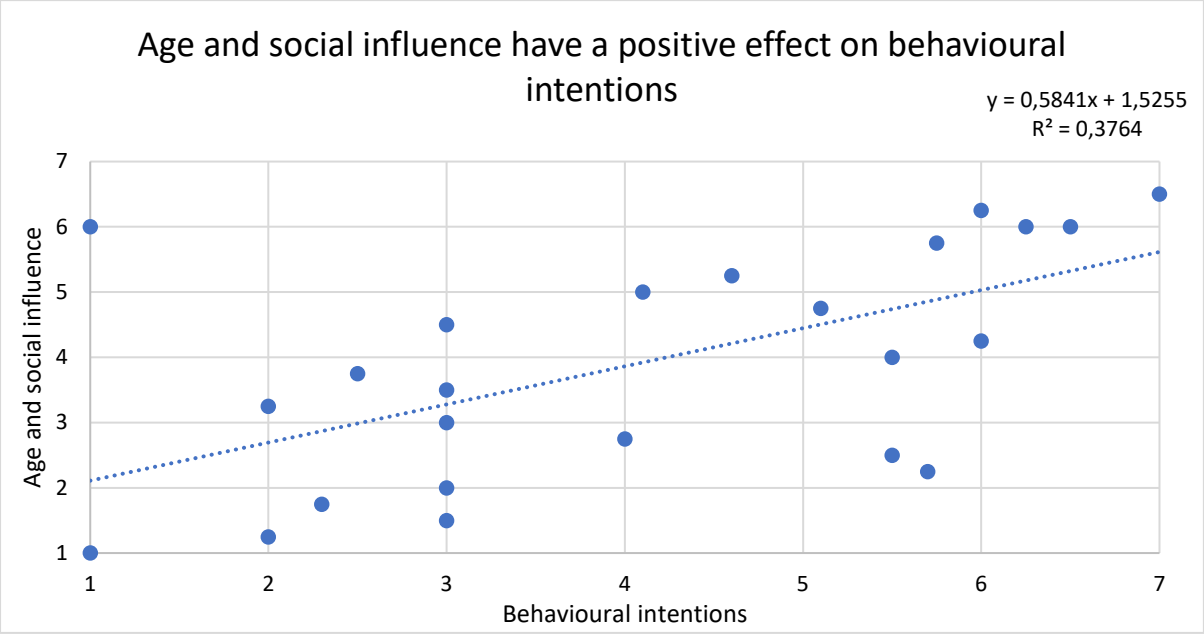


Figure 4 - 8: Correlation between age and social influence on behavioural intentions

H4 – Facilitating conditions and age determine the use behaviour

At a significance level of 0.01, the relationship between facilitating conditions and age on use behaviour is statistically significant. The correlation coefficient is 0.5642, and the p-value is 0.001, according to the results. This indicates that the two variables have a strong positive correlation. As a result, this finding supports H4, which states that facilitating conditions and age influence use behaviour, as illustrated in Figure 4 - 9.

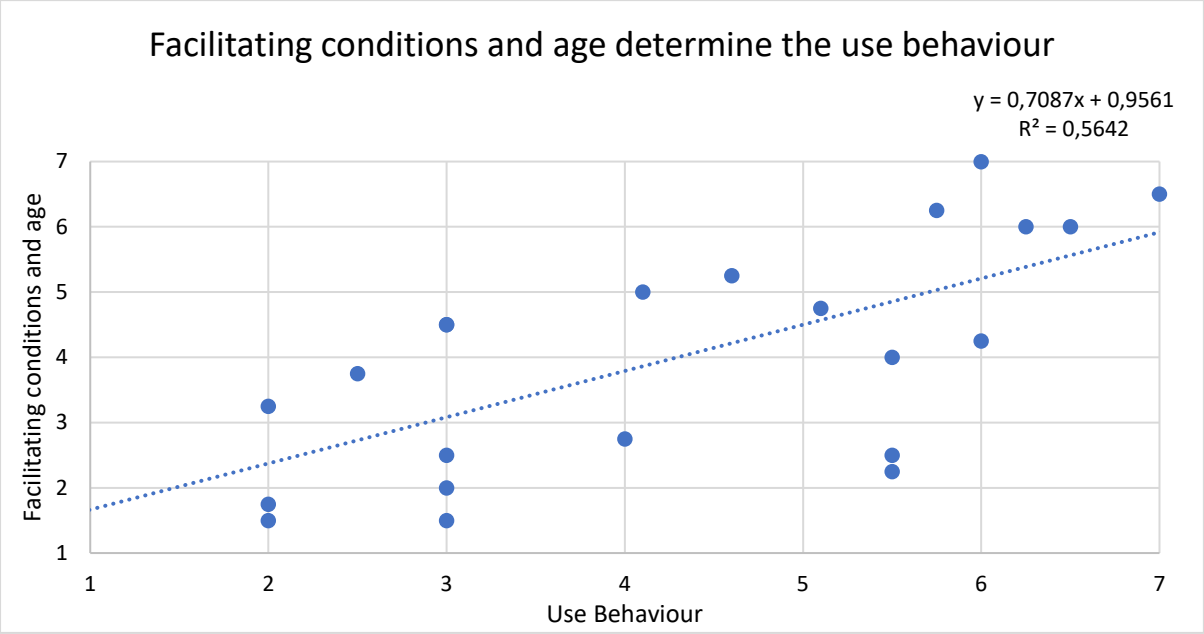


Figure 4 - 9: Correlation between facilitating conditions and age on use behaviour

H5 – Voluntariness of use and social influence positively effects behavioural intention.

At a significance level of 0.01 the relationship between voluntariness of use and social influence on behavioural intention is statistically significant. The correlation coefficient is 0.2543, and the p-value is 0.001, according to the results. This indicates that the two variables have a positive relationship. As a result, this finding supports H5, which states that the voluntariness of use and social influence has a positive effect on behavioural intention as shown in Figure 4 - 10.

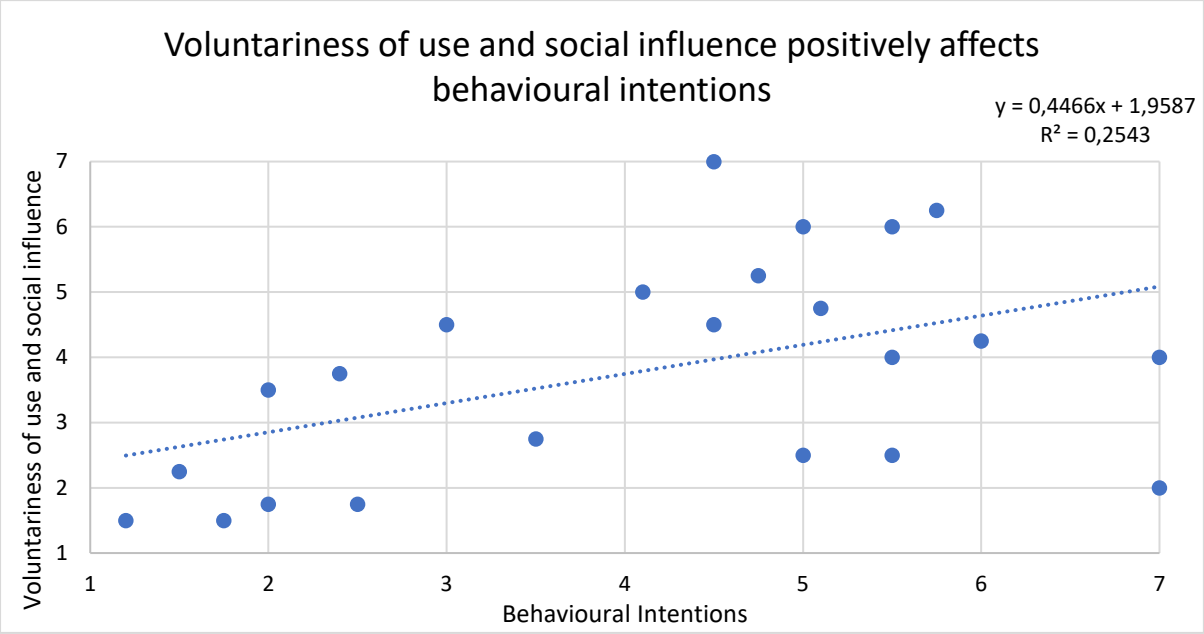


Figure 4 - 10: Correlation between voluntariness of use and social influence on behavioural intentions

4.5.2 Multiple regression analysis

The results of multiple regressions were presented in this section to investigate the impact of multiple independent variables on a single dependent variable. One linear regression was performed in order to determine the variable, Perceived Usefulness.

The relationship between the dependent variable, Perceived Usefulness and the independent variable, consumers' intentions to use Internet banking, was investigated using multiple linear regressions. According to the results, R squared is 0.542, which means that the model explained approximately 54% of the variance in consumer's intentions to adopt Internet banking or, more simply, the independent variables can account for 54% of consumers' intentions to adopt digital banking. At the p-level of 0.001, this is statistically significant.

Model Summary

Model	R	R Square	Adjusted R	Std. Error of the estimate
1	0.7362	0.542	0.538	0.99848

Anova: Single Factor						
SUMMARY						
Groups	*Count*	*Sum*	*Average*	*Variance*		
Column 1	240	536	2.233333333	0.531101813		
Column 2	240	452	1.883333333	0.20390516		
Column 3	240	331	1.379166667	0.253120642		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	88.50277778	2	44.25138889	134.3492122	2.79493E-50	3.008283824
Within Groups	236.1625	717	0.329375872			
Total	324.6652778	719				

The adjusted means squares measure the variation amongst the fitted values and are used to determine the p value for the term. For this particular test, $\alpha=0.05$, we can reject the null hypothesis and conclude that the difference between the variables is statistically significant. The adjusted SS measures the variation for different components of the model.

4.6 Hypotheses outcomes

This chapter presented the sample population of 240 respondents that were used. The second presentation was the demographic information which included the age, gender, geographic location and employment status. Normality tests were conducted on the sample population, followed by descriptive statistics on the data received. A Principle Component Analysis was conducted, followed by a Cronbach's alpha test to measure the reliability and validity of the sample. Finally, to test the hypotheses, a Pearson's correlation was conducted, followed by a multiple regression analysis and ANOVA test.

Table 4- 9: Summary of hypotheses outcomes

Hypothesis	Description	Result
H1	Perceived usefulness will positively impact a consumer's intention to adopt digital banking	Support
H2a	The perceived ease of use will positively affect a consumer's intention to adopt digital banking.	Support
H2b	The perceived ease of use will positively affect a consumer's trust to digital banking	Support
H2c	Perceived ease of use will positively affect the consumer's perceived usefulness of digital banking	Support
H3	Age behaviour determines the use behaviour of digital banking	Support
H3a	Age and performance expectancy have a positive effect on behavioural intention	Support

H3b	Age and effort expectancy have a positive effect on behavioural intention	Support
H3c	Age and social influences have a positive effect on behavioural intention.	Support
H4	Facilitating conditions and age determine the use behaviour	Support
H5	Voluntariness of use and social influence positively effects behavioural intentions	Support

CHAPTER 5 DISCUSSION OF RESULTS

5.1 Discussion of each of the objectives presented

This chapter presents a formal discussion of the findings related to the constructs of perceived ease of use and age behaviour. The discussion includes a conclusion and suggestion for each construct, based on the key findings from the study and a comparison to prior research.

Perceived usefulness

This research established a positive and statistically significant correlation between perceived usefulness and consumer intention to use digital banking. Furthermore, the study revealed that perceived usefulness was the most significant factor influencing consumer intention to adopt digital banking platforms. This suggests that when deciding whether or not to use digital banking, South African consumers primarily consider the platform's usefulness. Previous research conducted by Musyaffi et al. (2022) defined perceived usefulness as an individual's assessment and confidence in the superiority of online banking compared to traditional methods, such as visiting a branch to complete transactions. Mansour's (2016) statement also supported this finding by asserting that greater perceived usefulness would lead to increased acceptance of digital banking.

Certain studies have reported an insignificant relationship between perceived usefulness and consumer intention in digital banking adoption among Indonesian students (Widyanti & Usman, 2016). This finding suggests that the perceived usefulness did not play a significant role in determining these students' adoption of digital banking. This may be because they were accustomed to using traditional

banking methods and had a reasonable understanding of the benefits offered by digital banking.

20.3% of South African households have access to the internet at home, and 80.9% have access elsewhere (Statssa, 2022). Therefore, within the South African context, it is estimated that 20% of citizens do not have internet access. There are an estimated 38.23 million users of smartphones (Statssa, 2022). From this, it can be deduced that access to the internet in South Africa is a limiting factor for consumers to adopt digital banking, and not all individuals in the workforce have access to or make use of a smartphone device.

According to Khalifa and Shen's (2008b) theory, digital banking utilitarian values influence consumers' intention to use. Therefore, it is clear from the study's context that respondents' willingness to use digital banking is largely based on perceived usefulness. Thus, to benefit from digital banking, financial institutes should ensure that the digital platforms that are created offer consumers useful content that would ultimately make their experience flawless, in contrast to alternative banking methods, like visiting a physical branch network.

A study conducted by (Safeena et al., 2013) demonstrates a positive relationship between Internet banking use and perceived usefulness and ease of use, supporting the hypothesis. This research indicates that in contrast to other banking delivery channels, consumers prefer online banking because of its conveniences and advantages. Safeena et al. (2013) study found that consumers are more inclined to use digital banking when consumers believe it to be beneficial (Safeena et al., 2013). Similarly, when digital banking is user-friendly, consumers are more likely to use it,

which demonstrates that consumers base their intention to use online banking on platforms that are user-friendly and yield positive experiences (Safeena et al., 2013).

Perceived ease of use

This study found that perceived ease of use has a positive and significant effect on consumers' intentions to use digital banking. This finding was consistent with previous studies that found perceived ease of use to be a determining factor in adopting digital banking (Safeena et al., 2013).

Even though this construct has been thoroughly studied in the past, the outcomes have not always been reliable. According to the studies that found no significant relationship between perceived ease of use and consumer intention, ease of use is less of a deciding factor in adopting a given technology or system among younger and more technologically savvy consumers (Yadav et al., 2016). It is assumed that these consumers are more likely to adopt digital banking as they are already accustomed to using digital platforms, and as a result, the perceived ease of use would not be a deciding factor in deciding to use digital banking.

In the context of this study, 35% of the respondents were aged between 18 and 30, and 48% were aged between 31 and 45. These consumers found the perceived ease of use to be a critical factor in determining the adoption of digital banking. This could be because, even though the consumers were relatively young, smartphone penetration is relatively low, implying that South African consumers are not as technologically savvy compared to other countries (Wei et al., 2009).

Consumers in South Africa value user-friendliness in digital banking applications. To drive adoption and usage, software developers should ensure that digital banking applications are intuitive and simple to use. All things being equal, Davis (1989)

suggests that the more a system is perceived as simple, the more likely it is to be adopted and utilised.

Age

Some research in the literature on mobile banking adoption found that typical digital banking users were relatively young (Joushua & Koshy, 2011) or discovered that the elderly had more resistance to change and a negative attitude toward using digital banking services (Laukkanen et al., 2007). Certain studies, however, discovered that respondents aged 50 and older were most eager to use digital banking services (Suoranta & Mattlia, 2004), typical mobile banking users were aged between 30 – 49 (Laukkanen et al., 2007), and middle ages or older consumers were the primary users of digital banking (Laforet & Li, 2005; Dasgupta et al., 2001; Ho et al., 2020).

Ho et al. (2020) studies showed that early adopters of technological innovations are typically younger, have higher incomes, are better educated, and have a higher social status. Therefore, some research findings in digital banking are inconsistent. Age was a crucial factor in this study, especially in the South African context, as it is coupled with performance expectancy, effort expectancy, social influence, and facilitating conditions.

Facilitating conditions

A study conducted by Zhou et al. (2019) determined that social influence and facilitating conditions had the strongest influence on behavioural intention. The availability and quality of technological infrastructure, such as internet connectivity, smart devices and secure servers can significantly impact users' perceptions of how easy it is to engage with digital platforms.

According to the study, users' confidence in digital banking in South Africa is closely tied to security measures implemented by banks. Facilitating conditions include robust security protocols, encryptions, and authentication methods that assure users of the safety of their financial transactions and personal information. South African consumers are wary of security and privacy concerns when conducting their financial transactions on a digital banking platform.

In the context of digital banking, facilitating conditions, as per UTAUT, encompass a range of external factors that can significantly influence consumer perceptions and their willingness to adopt technology. By improving infrastructure, technical support, security measures, accessibility and organisational support, banks can enhance the facilitating conditions and, in turn, promote the acceptance and effective use of digital banking services. Understanding and optimising these conditions are crucial for financial institutions aiming to provide a seamless and user-friendly digital banking experience thus resulting in an uptake of digital banking services.

CHAPTER 6 CONCLUSION

This chapter begins by summarising the profile of the respondents and then emphasises certain findings in relation to the study's goals. It then provides recommendations for important stakeholders and summarizes potential contributions of this study and their impact on digital banking amongst South African consumers. Finally, the chapter offers ideas for further study and a summary.

6.1 Conclusion by each objective

The purpose of this study was to examine the impact of digital banking among South African consumers using The Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology. Constructs from both models were extracted to examine the impact of digital banking amongst South African consumers. These constructs were accepted from preceding research.

The following section will provide a brief summary of the research hypotheses' findings as they relate to the research objectives.

Research objective 1: *To examine the level of adoption of digital banking services amongst South African consumers using the TAM model extracting elements from their constructs.*

The constructs that were utilised during this study from the TAM model were perceived ease of usefulness and perceived ease of use. The study found a positive and significant relationship between perceived usefulness and a consumer's intention to use a digital platform. It was found that perceived usefulness was the second most significant factor that influenced consumers' intention to adopt digital banking. The perceived ease of use had a positive and significant effect on consumers' trust,

perceived usefulness and intention to adopt digital banking. As such, H1, H2a, H2b, and H3c were supported.

Research objective 2: *To examine the demographic factors that influence the adoption of digital banking in South Africa.*

The study found that demographic factors play an important part in the influence of the adoption of digital banking in South Africa. It was found that Age had the most significant influence on consumers' intentions to adopt digital banking. The constructs of Age and Performance Expectancy had a significant and positive effect on consumers' intention to adopt digital banking, whereas, Age and Effort Expectancy had a positive effect, however not as significant. Thus H3, H3a, H3b and H3c was supported

Research objective 3: *To examine and analyse the challenges and barriers that South African consumers face when using digital banking services, including issues related to technology literacy, security concerns and access to digital infrastructure.*

Facilitating conditions and age were found to have a positive and significant effect on consumer's intention to use digital banking due to various concerns raised. External factors and previous experience determined the intention of consumers to utilise digital banking. Facilitating conditions and age also determined the use behaviour as supported by H4.

Research objective 4: *To explore South African consumers' security and privacy concerns in the context of digital banking and their impact on the adoption* of digital banking.

To explore security and privacy concerns, voluntariness of use and social influence had a positive effect, although not very significant, on the impact of digital banking. H5

was supported, but there are opportunities for further investigative studies that hone into the respective variables and their influence on digital banking uptake.

6.2 Recommendations and practical implications of the study

The impact of digital banking amongst South African consumers has been transformative, offering accessibility, and efficiency in financial transactions. To navigate and harness this impact effectively, the following recommendations and practical implications can be implemented.

Digital literacy programmes – implementing digital literacy programmes to enhance consumers' understanding of digital banking tools and technologies. This can be achieved by collaborating with educational institutes, community organisations, and government bodies to conduct workshops and training sessions on digital banking. Empower consumers with the skills needed to navigate digital platforms confidently. This can be a hybridised approach, in person workshops as well as online workshops. The benefits of having in-person workshops will potentially encompass individuals who do not necessarily have access to the internet, thus giving potential users a glimpse of what is possible.

Tailored mobile applications – by developing and enhancing mobile banking applications with user-friendly interfaces and features tailored to the needs of South African consumers. This can be implemented by continuously gathering user feedback and preferences to improve the mobile banking experience and ensuring that applications are accessible, secure and compatible with various devices commonly used by the local population.

Security and trust building – by investing in robust security measures and communicating them transparently to build trust amongst consumers. This can be

implemented by two-factor authentication, encryption and regular security audits. Furthermore, banking officials can educate consumers about the safety measures in place provide channels for reporting suspicious activities and establish a strong online presence with clear communication on security protocols.

Inclusive financial services – by expanding digital banking services to include a broad range of financial products, catering to diverse consumer needs. This can be achieved by collaborating with regulatory bodies to ensure that digital banking platforms offer comprehensive services, including savings, loans, insurance, investment products, home loans and vehicle finance. Tailoring offerings to address the financial inclusion needs of different demographics.

Collaboration with fintech partners—Foster partnerships with local companies to drive innovation and enhance digital banking solutions. This can be implemented by exploring collaboration opportunities with fintech start-ups that specialise in areas such as payment solutions, personal finance management, and blockchain technology. Financial institutes can leverage their expertise to enhance the functionality and competitiveness of digital banking services.

Consumer support and engagement – by strengthening consumer support services and engagement channels to address consumer queries and concerns promptly. Implement responsive consumer service through multiple channels, including chat support, social media and dedicated helplines. Utilise data analytics to anticipate common issues and proactively address them. Foster an active online community for consumers to share experiences and tips.

Regulatory compliance—by staying abreast of and complying with national regulatory requirements governing digital banking. This implication can be achieved by

establishing a dedicated compliance team to monitor and ensure adherence to regulatory changes. Engage with regulatory bodies to contribute to the development of policies that foster responsible and secure digital banking practices.

Financial educational initiatives: Launch financial literacy campaigns to empower consumers to make informed decisions about digital financial services. Financial institutes can collaborate with schools, community centres, and non-profit organisations to provide financial educational programmes. Consumers can learn about budgeting, responsible borrowing, and the potential benefits and risks associated with digital banking.

By implementing these recommendations and practical implications, financial institutions operating in South Africa can optimise the impact of digital banking, ensuring that it aligns with the needs and preferences of the local consumer base while promoting financial inclusion and literacy.

6.3 Suggestions

- Further research should be conducted for traditional banks to determine whether the implementation of self-service branches would be effective for consumers, such as Tyme Bank's self-service kiosk.
- Security amongst South African Consumers remains a high priority, whereby financial institutes need to consider strengthening their encryption and biometrics systems to allow consumers peace of mind before migrating to digital banking.
- The impact of digital banking in rural areas considering the low internet access for consumers situated in these areas.

- A study should be conducted to investigate the environmental impact of conducting face-to-face business versus utilising digital channels. This study should focus on the sustainable development and growth of any financial institution from an environmental perspective.
- Financial institutions should investigate and, if feasible, implement community-focused improvement projects that drive increased connectivity to the World Wide Web.

6.4 Limitations

The limitation of this study is that the research will potentially reach a fair sample throughout South Africa. However, the geographic distribution was unfair and focused predominantly on certain provinces within South Africa. The sample size is insufficient to base the study on South Africa as a study, which skews the data to these certain provinces. The impact of digital banking is widely studied around the world but not necessarily focusing on South Africa where there is a void, resulting in a deficiency of previous studies for South Africa. The survey was distributed via digital platforms to potential participants, which limited the potential for individuals who lack digital knowledge, to gain access to the questionnaire which could possibly have an effect on the final results. This study is limited to the impact that is caused by digital banking to consumers in South Africa, and not a study to test which bank offers the better digital platform, products offered or the useability of their digital platforms.

References

Aboelmaged, M., & Gebba, T. (2013). Mobile Banking Adoption: An Examination of Technology Acceptance Model and Theory of Planned Behavior. *International Journal Of Business Research And Development*, *2*(1). https://doi.org/10.24102/ijbrd.v2i1.263

Adwok, J. (2017). Probability and Non-Probability Sampling. *Asian Research Journal Of Business Management*, *4*(4). https://doi.org/10.24214/arjbm/4/4/113124

Ahn, S., Jo, W., & Chung, D. (2019). Factors Affecting Users to Adopt Voice Shopping: Empirical evidence from the UTAUT model. *The Korea Society For Innovation Management & Economics*, *27*(4), 111-144. https://doi.org/10.14386/sime.2019.27.4.111

Ajibade, P., & M. Mutula, S. (2020). Big Data, 4IR and electronic banking and banking systems applications in South Africa and Nigeria. *Banks and Bank Systems*, *15*(2), 187–199. https://doi.org/10.21511/bbs.15(2).2020.17

Alexander, A. J., Shi, L., & Solomon, B. (2017). *How Fintech Is Reaching the Poor in Africa and Asia: A Start-up Perspective*. https://doi.org/10.1596/30360

Anbalagan, Dr. G. (2017). New technological changes in Indian Banking Sector. *International Journal of Scientific Research and Management*. https://doi.org/10.18535/ijsrm/v5i9.11

An understanding of impact on retail customers viewpoint towards bank charges in banking sector. (2022). *Trends in Banking, Accounting and Business*, *1*(1), 27–28. https://doi.org/10.46632/tbab/1/1/6

Banks Use Technology to Ride the Wave of Transformation | ARCA. Arca.com. (2022). Retrieved 27 February 2022, from https://arca.com/resources/blog/banks-use-technology-to-ride-the-wave-of-transformation.

Berg, M.V. den *et al.* (2023) *Transforming the south african banking landscape: Eight emerging trends*, *EY South Africa | FS Banking Series | Financial Services |*

June 2023. Available at: https://www.ey.com/en_za/financial-services/ey-south-africa---fs-banking-series---financial-services---june- (Accessed: 05 December 2023).

Brown, R., & Stearns, P. (1996). The Industrial Revolution in World History. *The History Teacher*, *29*(2), 253. https://doi.org/10.2307/494750

Burmeister, E., & Aitken, L. M. (2012). Sample size: how many is enough? A*ustralian Critical Care*, 25(4), 271-274. https://doi.org/10.1016/j.aucc.2012.07.002

Camarate, J., & Brinckhmann, S. (2018). The future of banking: A South African perspective. *PWC*. Retrieved 14 March 2022, from https://www.pwc.co.za/en/assets/pdf/strategyand-future-of-banking.pdf.

Chen, Z., Li, Y., Wu, Y., & Luo, J. (2017). The transition from traditional banking to Mobile Internet Finance: An organizational innovation perspective - A comparative study of Citibank and ICBC. *Financial Innovation*, *3*(1). https://doi.org/10.1186/s40854-017-0062-0

Crafts, N. (2011). Explaining the first Industrial Revolution: two views. *European Review Of Economic History*, *15*(1), 153-168. https://doi.org/10.1017/s1361491610000201

Creswell, J. W. (2000). *Research Design Qualitative and Quantitative Approaches* (3rd ed.).

Cumming, R. G. (2010). Is probability sampling always better? A comparison of results from a quota and a probability sample survey. *Community Health Studies, 14(2),* 132-137. https://doi.org/10.1111/j/1753-6405.1990.tb00033.x

Dimitrova, I., Öhman, P. and Yazdanfar, D. (2021) “Barriers to bank customers’ intention to fully adopt digital payment methods,” *International Journal of Quality and Service Sciences*, 14(5), pp. 16–36. Available at: https://doi.org/10.1108/ijqss-03-2021-0045.

Exchange, T. (2022) *South Africa Central Bank identifies cybercrime's growing threats to banking sector*, *FurtherAfrica*. Available at: https://furtherafrica.com/2022/08/12/south-africa-central-bank-identifies-cybercrimes-growing-threats-to-banking-sector/#:~:text=The%20South%20African%20Reserve%20Bank%20(SARB)%20has%20identified%20cybercrime%20and,money%2Dlaundering%20and%20fund%20terrorism. (Accessed: March 29, 2023).

Gefter, A. (2010). Jeremy Rifkin and the third industrial revolution. *New Scientist*, *205*(2747), 46. https://doi.org/10.1016/s0262-4079(10)60370-3

Guerra-Leal, E. M., Arredondo-Trapero, F. G., & Vázquez-Parra, J. C. (2021). Financial Inclusion and digital banking on an emergent economy. *Review of Behavioral Finance*, *15*(2), 257–272. https://doi.org/10.1108/rbf-08-2021-0150

Hendriyani, C., & Raharja, S. (2018). Analysis building customer engagement through e-CRM in the era of digital banking in Indonesia. *International Journal Of Economic Policy In Emerging Economies*, *11*(5), 479. https://doi.org/10.1504/ijepee.2018.10016102

Hirchenko, D., Semeniuk, M., & Cherikovska, N. V. (2020). Role of Digital Economy in the development of National Economy. *Economic Development: Global Trends and National Peculiarities*. https://doi.org/10.30525/978-9934-588-61-7-5

Ho, J. C., Wu, C.-G., Lee, C.-S., & Pham, T.-T. T. (2020). Factors affecting the behavioral intention to adopt Mobile Banking: An international comparison. *Technology in Society*, *63*, 101360. https://doi.org/10.1016/j.techsoc.2020.101360

Joshua, A. J. and M. P. Koshy, “Usage patterns of electronic banking services by urban educated customers: Glimpses from India,” Journal of Internet Banking and Commerce, Vol. 16, No. 1: 1-12, 2011.

Laukkanen, T., S. Sinkkonen, M. Kivijarvi, and P. Laukkanen, “Innovation resistance among mature consumers,” International Journal of Marketing, Vol. 24, No. 7: 419-427, 2007.

Leavy, P. (2017). *Research Design*. Guilford Publications.

Malyshev, A. (2023) *What is Digital Banking? meaning, types and benefits*, *SDK.finance - White-Label Digital Banking Software*. Available at: https://sdk.finance/what-is-digital-banking/ (Accessed: 05 December 2023).

Masrom, M. (2007). Technology Acceptance Model and E-learning. *International Conference On Education, Sultan Hassanal Bolkiah Institute Of Education Universiti Brunei Darussalam*, *12*. Retrieved 16 March 2022, from.

Mehdiabadi, A., Tabatabeinasab, M., Spulbar, C., Karbassi Yazdi, A., & Birau, R. (2020). Are We Ready for the Challenge of Banks 4.0? Designing a Roadmap for Banking Systems in Industry 4.0. *International Journal Of Financial Studies*, *8*(2), 32. https://doi.org/10.3390/ijfs8020032

Michael Musyaffi, A., Juhaida Johari, R., Rosnidah, I., Kismayanti Respati, D., Wiradendi Wolor, C., & Yusuf, M. (2022). Understanding digital banking adoption during post-coronavirus pandemic: An Integration of Technology Readiness and Technology Acceptance Model. *TEM Journal*, 683–694. https://doi.org/10.18421/tem112-23

Mitham, S. (2023) *5 issues and challenges in the online banking sector*, *Inbound FinTech*. Inbound FinTech. Available at: https://blog.inboundfintech.com/5-issues-and-challenges-in-the-online-banking-sector (Accessed: March 29, 2023).

Moden, N., & Neufled, P. (2022). *Businessman riding skateboard and using cell-phone How COVID-19 has sped up digitization for the banking sector*. EY. Retrieved 27 March 2022, from https://www.ey.com/en_gl/financial-services-emeia/how-covid-19-has-sped-up-digitization-for-the-banking-sector.

Mujinga, M., Eloff, M., & Kroeze, J. (2018). System usability scale evaluation of online banking services: A South African study. *South African Journal Of Science*, *114*(3/4). https://doi.org/10.17159/sajs.2018/20170065

Pazarbasioglu, C., Mora, A. G., Uttamchandani, M., Natarajan, H., Feyen, E., & Saal, M. (2020). Digital Financial Services to women: Access and constraints. *World Bank Group*, 51–72. https://doi.org/10.1108/978-1-83867-855-520201004

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. *Internet Research*, *14*(3), 224-235. https://doi.org/10.1108/10662240410542652

Queiros, Faria, & Almeida. (2017). European journal of education studies. *Strengths and Limitations of Qualitative and Quantitative Research Methods*, *3*(9). https://doi.org/10.5281/zenodo.887089

Ramavhona, T., & Mokwena, S. (2016). Factors influencing Internet banking adoption in South African rural areas. *SA Journal Of Information Management*, *18*(2). https://doi.org/10.4102/sajim.v18i2.642

Safeena, R., Date, H., Hundewale, N., & Kammani, A. (2013). Combination of tam and TPB in internet banking adoption. *International Journal of Computer Theory and Engineering*, 146–150. https://doi.org/10.7763/ijcte.2013.v5.665

Said, A. I., & Angelita, M. (2020). Determining factors for success of Banking Digital Transformation. *Proceedings of the 3rd Asia Pacific Management Research Conference (APMRC 2019)*. https://doi.org/10.2991/aebmr.k.200812.041

Sardana, V., & Singhania, S. (2018). Digital technology in the realm of banking: A review of literature. *International Journal of Research in Finance and Management*, *1*(2), 28–32. https://doi.org/10.33545/26175754.2018.v1.i2a.12

Selected SA Banking Sector Trends - Monthly. Resbank.co.za. (2022). Retrieved 6 February 2022, from https://www.resbank.co.za/en/home/publications/publication-detail-pages/prudential-authority/pa-statistics-selected-trends---monthly/2021/Selected-SA-Banking-Sector-Trends---Monthly.

Sharma, J. (2023). Digital Transformation in banking industry. *Reference Module in Social Sciences*. https://doi.org/10.1016/b978-0-44-313776-1.00105-7

Sheldon, A. (2019) Chapter 9. A digital blueprint for Banks. *The Digital Banking Revolution*, 87–92. https://doi.org/10.1515/9781547401598-009

Shevlin, R. (2022). *The 5 Hottest Technologies In Banking For 2021*. Forbes. Retrieved 27 February 2022, from https://www.forbes.com/sites/ronshevlin/2021/01/18/the-5-hottest-technologies-in-banking-for-2021/.

South Africa: digital population 2021 | Statista. Statista. (2022). Retrieved 17 February 2022, from https://www.statista.com/statistics/685134/south-africa-digital-population/#:~:text=South%20Africa%3A%20digital%20population%20as%20of%20January%202021&text=As%20of%20January%202021%2C%20there,million)%20also%20used%20mobile%20internet.

Statssa.gov.za. (2022). Retrieved 17 February 2022, from http://www.statssa.gov.za/publications/P0318/P03182020.pdf.

SÜRÜCÜ, L., & MASLAKÇI, A. (2020). VALIDITY AND RELIABILITY IN QUANTITATIVE RESEARCH. *Business & Management Studies: An International Journal*, *8*(3), 2694–2726. https://doi.org/10.15295/bmij.v8i3.1540

Thatte, S. S., & Kulkarni, S. M. (2021). Digital Banking: Leverage to banking clients. *2021 9th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions) (ICRITO)*. https://doi.org/10.1109/icrito51393.2021.9596556

Thu Nguyen, T., Thi Nguyen, H., Thi Mai, H., & Thi Minh Tran, T. (2020). Determinants of Digital Banking Services in Vietnam: Applying UTAUT2 Model. *Asian Economic And Financial Review*, *10*(6), 680-697. https://doi.org/10.18488/journal.aefr.2020.106.680.697

Uygun, Y. (2021). The Fourth Industrial Revolution - Industry 4.0. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3909340

Worldwide Broadband Speed League 2021 - Cable.co.uk. Cable.co.uk. (2022). Retrieved 17 February 2022, from https://www.cable.co.uk/broadband/speed/worldwide-speed-league/.

Writer, S. (2022). *How South Africa's 5 biggest banks continue to dominate*. Businesstech.co.za. Retrieved 14 February 2022, from https://businesstech.co.za/news/banking/506740/how-south-africas-5-biggest-banks-continue-to-dominate/.

Writer, S. (2022). *Standard Bank on closing branches: We can't stop the progress of technology*. Businesstech.co.za. Retrieved 27 February 2022, from https://businesstech.co.za/news/banking/369488/standard-bank-on-closing-branches-we-cant-stop-the-progress-of-technology/.

Watson, R. (n.d). Qutantitative research. Retrieved from https://doi.org/10.7748/ns.29.31.44.e.8681

Widyanti, J., & Usman, O. (2019). Leverage of perceived usefulness, perceived ease of use, information quality, behavioral intention towards intention to use mobile banking. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3509950

Wei, T. T., Marthandan, G., Chong, A. Y. L., Ooi, K. B., & Arumugam, S. (2009). What drives Malaysian m-commerce adoption? An empirical analysis. Industrial management & data systems. 109(3), 370-388.

Yadav, R., Sharma, S. K., & Tarhini, A. (2016). A multi-analytical approach to understand and predict the mobile commerce adoption. Journal of enterprise information management. 29(2), 222-237.

Yaghoubi, N., & Bahmani, E. (2010). Factors Affecting the Adoption of Online Banking-An Integration of Technology Acceptance Model and Theory of Planned Behavior. *International Journal Of Business And Management*, *5*(9). https://doi.org/10.5539/ijbm.v5n9p159

Zhou, L. L., Owusu-Marfo, J., Asante Antwi, H., Antwi, M. O., Kachie, A. D., & Ampon-Wireko, S. (2019). “assessment of the social influence and facilitating conditions that support nurses’ adoption of Hospital Electronic Information Management Systems (Heims) in Ghana using the unified theory of acceptance and use of technology (utaut) model”. *BMC Medical Informatics and Decision Making*, *19*(1). https://doi.org/10.1186/s12911-019-0956-z