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Title

Financial inclusion through WhatsApp banking in Johannesburg

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

Supervisor: Garth Balabanoff

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LIST OF ABBREVIATIONS

ABSA - ABSA Group Limited

ANCOVA - Analysis of Covariance

ANOVA - Analysis of Variance

App - application

ASU - Actual System Use

ATM - Automated Teller Machine

ATU - Attitude Towards Using

BITU - Behavioural Intention to Use

FinTech - Financial Technology

FNB - First National Bank

GTBank - Guaranty Trust Bank

ITU - Intention to Use

m-banking - mobile banking

PEOU - Perceived Ease of Use

PU - Perceived Usefulness

SMS - Short Message Service

SSA - Sub-Saharan Africa

TAM - Technology Acceptance Model

USSD - Unstructured Supplementary Service Data

ABSTRACT

Approximately three billion people will use mobile banking by 2024. Mobile devices and widespread Internet access are helping to boost mobile banking's popularity. Retail banks can now offer their customers even more convenience with mobile banking applications like WhatsApp. Consumers and financial institutions have embraced advanced technologies, including mobile banking, in recent years. Social media, mobile banking and new ideas like WhatsApp banking have made it easier for people to do business. Mobile banking is now possible thanks to high smartphone penetration and technological advancements. The fourth industrial revolution will continue to exponentially transform the modern economy. Globalisation has forced banks to open new channels to remain competitive in today's market. Banks have had to cut costs and improve their financial position by introducing new products and services. Mobile banking has grown rapidly globally due to the rapid development of information technology. Due to multi-channel distribution, most banks now have a global presence with cross-border customers.

A quantitative approach was taken to examine factors that may influence behavioural intention to use WhatsApp banking in the context of financial inclusion. A questionnaire was used as the primary data collection instrument. The survey was conducted using an online questionnaire distributed to people living in Johannesburg, South Africa.

The study adds to the body of knowledge by identifying factors that influence WhatsApp banking adoption, particularly in developing countries. The Technology Acceptance Model by Davis (1985) was used to investigate behavioural intention to use WhatsApp banking. My findings show that perceived trust, banking inclusion, perceived usefulness and awareness all play a significant role in WhatsApp banking adoption. Managers in financial institutions should focus on increasing consumer trust across all age groups to increase customer comfort with non-traditional banking platforms in general and thus increase financial inclusion. This is crucial because

WhatsApp banking has the potential to bank the unbanked and underbanked while also increasing financial inclusion.

Keywords: Africa, South Africa, Financial Inclusion, Banking, Technology Acceptance Model (TAM), WhatsApp Banking, Unbanked, Underbanked

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1 CHAPTER 1: INTRODUCTION

The first chapter of this research article discusses the characteristics of mobile banking and financial inclusion. The second section reviews the literature on mobile banking and how it can be used to promote financial inclusion by using WhatsApp. The study's research methodology follows this. The research findings are presented and discussed, and the final chapter serves as the conclusion.

1.1 Introduction

In recent years, the adoption of advanced technologies that include mobile banking services has grown exponentially among consumers and service providers in the financial sector (Gharaibeh et al., 2018). Emerging technologies and new ideas have made it easier for people, especially those in developing countries, to do business more quickly and improve their standard of living (Mswell, 2020).

With the fourth industrial revolution, technology will continue to transform the modern economy exponentially (Coetzee, 2016). To remain competitive in today's market, banks have been forced to open new channels due to increased globalisation (Koenaite et al., 2019). In fact, banks have been under a lot of pressure to cut costs and improve their financial position through new products and services (Koenaite et al., 2019). Mobile banking has proliferated globally because of the rapid development of information technology, especially in the last few years (Çera et al., 2020). Due to the widespread use of smartphones and technological advancements, banking customers could transact via mobile electronic platforms like smartphones (Mswell, 2020). A multi-channel distribution strategy has resulted in most banks having a global presence with customers who can use banking services across borders (Koenaite et al., 2019).

According to a Juniper Research forecast, approximately three billion people will be using mobile banking by 2024 (Nick, 2020). Access to mobile devices and Internet is contributing to the rise in popularity of mobile banking (Gichuki and Mulu-Mutuku, 2018). Using mobile banking applications (also known as mobile banking apps), retail banks can now offer their customers even more convenience than before with

mobile banking (Afshan et al., 2018). According to Balabanoff (2014), there has been an increase in crime and fraud globally, as well as an increase in technological advancement and pressure from banks on both the consumer and business to reduce costs for both parties.

In addition, consumers have driven innovative bank marketers to constantly improve their products and services (Balabanoff, 2014). Furthermore, Balabanoff (2014) says that for banks to provide their customers with a better experience, they need to invest in new mobile banking solutions that will allow customers to perform a wide range of banking tasks while on the go. Mobile banking reduces time and costs while increasing convenience and productivity. However, due to the cybernetic nature of the system and the risks associated with its use, trust issues arise. Because of this, retail banks must ensure that their mobile banking channels are secure and reliable (Koenaite et al., 2019).

According to Kauta et al. (2020), WhatsApp is one of the most widely used messaging platforms in healthcare, with roughly 1.5 billion users worldwide. According to StatsSA (2021a), in the third quarter of 2020, approximately 93 per cent of South African Internet users used WhatsApp; by 2021, there were approximately 23 million WhatsApp users in South Africa; this figure is expected to increase to 28.6 million users by 2026.

As a result, the primary focus of this research was to determine whether WhatsApp is a suitable platform and alternative for banks to provide banking services to South African consumers. The study specifically aimed to fill a gap by determining whether consumer awareness, perceived trust, perceived risk and perceived usefulness influence the adoption of WhatsApp banking in Johannesburg, South Africa.

1.2 Background of the study

Extreme poverty, slower growth, climate change, widening inequalities, unemployment and increasingly insecure working conditions plague the global economy, but the plight of Sub-Saharan Africa (SSA) is exacerbated because more than 204 million people are unemployed (Leal Filho et al., 2020). In addition, the

World Bank (2018), report identified extreme poverty, rising public debt or debt risk, slow labour market growth, a rising labour force and gender disparities as critical impediments to economic growth and sustainable development in SSA (Babajide et al., 2020). According to Rouse (2017), the lack of access to basic financial services (financial exclusion) is a global problem, but it is particularly severe in emerging economies, such as SSA.

The rapid spread of mobile devices has led to many people using mobile banking services worldwide, especially in Africa and other developing countries where the poorest people haven't had a bank account in the past (Pankomera & van Greunen, 2018). For the past two decades, Africa's rural communities have seen a significant increase in the number of mobile devices. And thanks to mobile connectivity, Africa has the fastest rates of Internet penetration, with the number of Internet users on the continent increasing by more than 20% in 2017 (Kemp, 2017, 2018).

As a result, mobile banking has helped disadvantaged people gain access to financial services in both developed and developing economies, including many African economies (Demirgüç-Kunt et al., 2012). Mobile banking was launched in South Africa in August 2002, with approximately 31 426 customers registering for the service (Dagada, 2013). Mobile banking through an application is a relatively new technological innovation with enormous potential to improve retail bank customers' banking experiences and streamline banks' operations (Thusi and Maduku, 2020). Mobile banking is gaining traction as a creative way to deliver financial services, particularly in developing countries. Retail banks want their customers to start using this new technology as soon as possible (Thusi and Maduku, 2020).

According to Bankole et al. (2011), individuals and businesses can use mobile banking to conduct financial transactions such as savings, money transfers and stock market trades at any time and place that is convenient for them. Mobile banking is a growing component of South African economic growth as it can help small businesses like spaza shops save money and make payments easier (Maimbo et al., 2010). According to Agrawal, (2021) WhatsApp can be used to

move data, share ideas and expertise, solve problems, keep in touch with people, and stay connected in both personal and professional life. The use of WhatsApp for banking purposes, however, has received little attention in the current research.

1.3 Context of the study

On a global level, financial inclusion is becoming more and more popular, and governments, financial institutions and policymakers are interested in understanding its impact better (Amoah et al., 2020; Mhlanga and Denhere, 2020). Both rich and poor countries agree that financial exclusion is a big problem for their societies (Sarma and Pais, 2011; Wentzel et al., 2016). One of the World Bank's goals for 2020 was to make sure everyone had access to money (The World Bank, 2020). Research has shown that financial inclusion can help with financial development, economic growth, reducing income inequality and lifting people out of poverty (Beck et al., 2009; Chibba, 2009; Demirgüç-Kunt, 2008; Demirgüç-Kunt et al., 2018).

The current focus of research is to determine whether WhatsApp is an effective tool for achieving financial inclusion. Achieving financial inclusion and linking it to economic growth are difficult (Rastogi and E., 2018). Financial inclusion has had less success in developing countries than developed countries (Jukan and Softic, 2016; Rastogi and E., 2018). The current study focused on South Africa, a developing country. As a result, the study's significance is critical.

In South Africa, mobile banking is a critical interface between banks and the lower-income population, facilitating money transfers, savings and investment opportunities (Chigada and Hirschfelder, 2017). South Africa has a high rate of mobile phone ownership (89%) and, as a result, has developed mobile money services (Poushter and Oates, 2015). According to Koech (2012), many countries in SSA have a higher rate of mobile phone subscriptions than bank accounts. In this context, the World Bank forecasts a bright future for mobile banking as a new era of financial services, particularly in emerging markets such as South Africa (The World Bank, 2020).

South Africa has one of the continent's strongest economies, demonstrating the critical role of technological advancement in the country's economic growth (Inglesi-Lotz et al., 2014). Cellular phone ownership is increasing, and as a result, mobile money services have been developed (Chigada and Hirschfelder, 2017). Direct channels and self-service have become top priorities for retail banking customers in recent years (Hamprecht and Brunier, 2011). This trend is fuelled by customer demand for enhanced and customised services, and mobile technology powers the digital landscape and will enhance banking services (Goyal et al., 2012).

Mobile banking is gaining traction in South Africa as multiple channels for initiating payments emerge, including SMS, applications and phone calls. According to Kandachar and Halme (2017), M-PESA (a mobile phone-based money transfer service) was introduced by Nedbank and Vodacom to enable their customers to transfer money without having a bank account. This was following the launch of Standard Bank's "Instant Money" innovation, a joint venture with SPAR, a retail-store company. First National Bank (FNB) then introduced an "e-Wallet" for customer transactions via a cell phone number. Likewise, ABSA Group Limited (ABSA) later introduced "Cash Send" to allow customers to send and receive cash from anyone in the country (Kandachar and Halme, 2017).

Ruxwana and Msibi (2018) note that since mobile devices outnumber computers in South Africa, they are well suited to processing payments. According to StatsSA (2020a), and as illustrated in Figure 1, approximately 22 million South Africans owned smartphones in 2019 or roughly a third of the population.

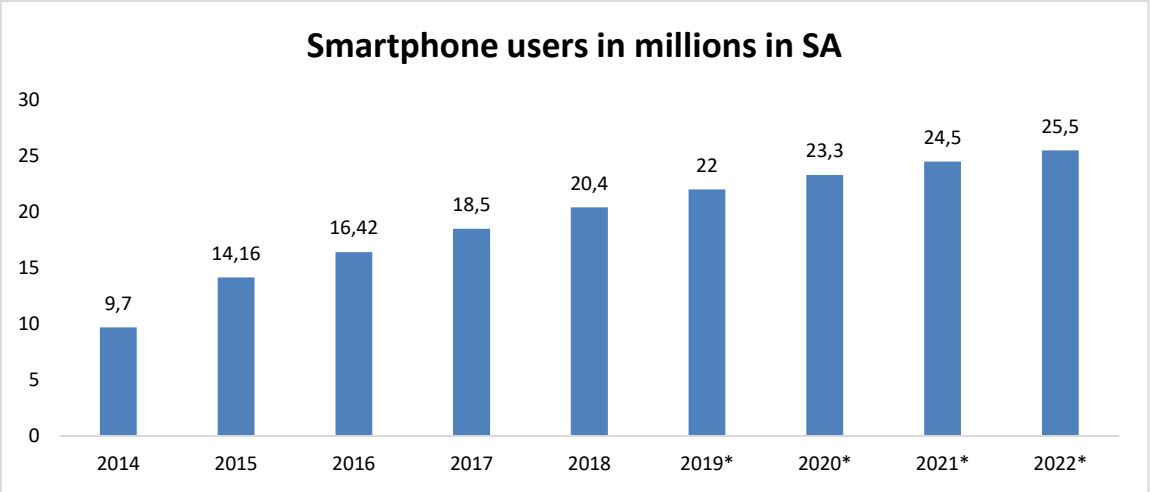


Figure 1: Smartphone users in SA (2014 to 2022) (in millions) (Source: StatsSA, 2020a)

StatsSA (2021a) further notes that South Africa had 38.13 million Internet users by January 2021 (Figure 2). The majority of Internet users did so via a cell phone, and almost 99 per cent of people using social media platforms did so via cell phones (StatsSA, 2021a). There is certainly potential for expansion in terms of Internet-enabled payments through mobile phones (Lawack, 2013).

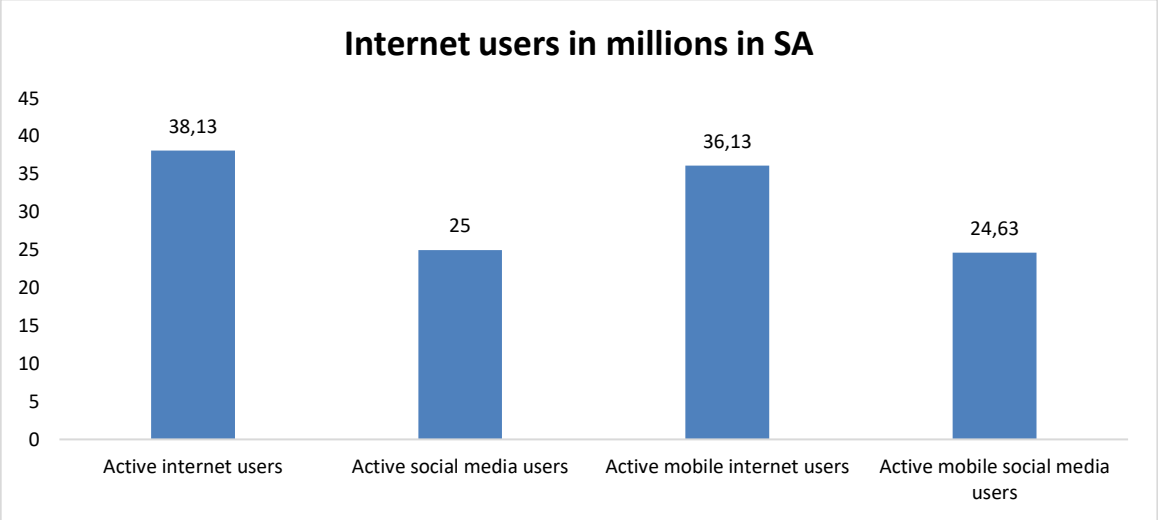


Figure 2: Digital population in South Africa as of January 2021 (in millions) (Source: StatsSA, 2021a)

WhatsApp is a messaging app founded in 2009 by two ex-Yahoo employees. WhatsApp has one billion monthly users and allows users to chat, send photos, videos, documents, and make phone calls. People from all walks of life have recognised WhatsApp's worth and benefits (Udenze et al., 2020).

The increasing coverage and quality of mobile network providers makes mobile phone technology an appealing platform for delivering financial services (Monhof et al., 2018). One such technology is WhatsApp banking, a mobile-based financial service created by one of South Africa's leading retail banks, ABSA (Udenze et al., 2020). As a socially sustainable FinTech (Financial Technology) tool, WhatsApp banking scores well on the LASIC (low margin, asset light, scalable, inventive, and compliance simple) paradigm (Lee and Low, 2018). However, (Techpoint.africa, 2018) characterised WhatsApp banking as a Facebook add-on. As the most widely used messaging network in Africa, WhatsApp offers banks a broader reach than Facebook Messenger. Some Nigerian banks also provide financial services through WhatsApp. These include GTBank, Access Bank and Zenith Bank (TechPoint. Africa, 2018).

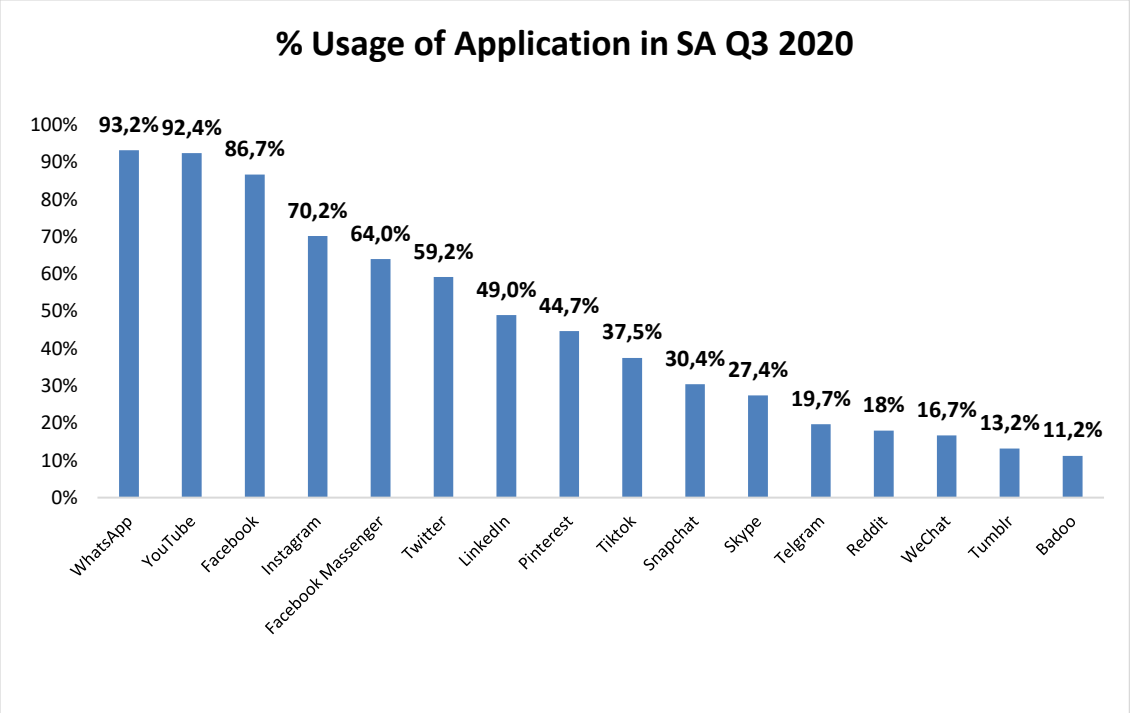


Figure 3: Most used social media platforms in South Africa – Q3 2020 (Source: StatsSA, 2020b)

The high level of Internet users using WhatsApp makes it easier to scale the product and penetrate the market faster.

1.4 Problem statement

1.4.1 Main problem

Access to financial services is dominated by medium to high-income groups, excluding lower-income groups, most of whom are historically disadvantaged (Omar and Inaba, 2020). These communities need solutions, goods, or services tailored to their cultural, socio-economic and geographical circumstances (Wilkerson et al., 2018).

Financial and economic development have been the subject of extensive theoretical and empirical research (Chowdhury et al., 2021). Despite considerable disagreement over the direction of causation in the finance-growth correlation, financial systems are critical for enabling and sustaining economic development. Furthermore, financial development is widely acknowledged to have significant outcomes not just for growth but also for poverty reduction (Beck et al., 2009).

Mobile banking innovation allows increased access and supply of financial services to demographic segments who previously had little or no access (Kim et al., 2018). However, the long-term viability and potential success of WhatsApp banking can't be guaranteed and can only be predicted with a high degree of certainty within an appropriate framework (Sharma, 2019). According to StatsSA (2020b), in quarter three of 2020, WhatsApp had the highest percentage usage in South Africa (Figure 3). As a result, the research aimed to evaluate whether mobile banking, through WhatsApp banking, is a socially viable and possibly effective mobile banking solution to improve financial inclusion. The Technology Acceptance Model (TAM) was used to explain and predict mobile banking adoption and its perceived usefulness by specifically looking at the behavioural intention towards using WhatsApp as a mobile banking service.

The potential success of WhatsApp banking was determined by conducting a desktop-based survey analysis to ascertain whether the service has the potential to grow and improve financial inclusion.

1.4.2 Sub-problems

According to Cable.co.uk (2021), mobile data is not cheap in South Africa, which may impact the adoption of WhatsApp banking.

Data privacy, cybersecurity and data breach concerns are especially important in the mobile banking industry (Wang et al., 2020). Banks have access to private information about people, making people less likely to trust new technologies (Hu et al., 2019).

Most lower-income groups, most of whom are historically disadvantaged, rely heavily on physical money (Bostic et al., 2020) to take a taxi, purchase food from neighbourhood stores, and so on (Fobosi and Fobosi, 2019).

1.5 Research objectives

1.5.1 Main objective

The main objective of this study was to examine the factors that may affect the behavioural intention to use WhatsApp banking in the context of financial inclusion in Johannesburg and how WhatsApp can help the banking industry make more people access financial solutions.

1.5.2 Specific objectives

a) To ascertain the differences in perceived trust in WhatsApp banking based on age group, after considering perceived self-efficacy.
b) To investigate the different factors influencing behavioural intention for WhatsApp banking adoption.
c) To assess customer awareness of mobile banking across all banking channels.

1.6 Research hypothesis

Below are three relevant research hypotheses according to the problem statement, research objectives and conceptual framework.

a) **Hypothesis (H_1)**: Perceived trust in WhatsApp banking differs among age groups when considering perceived self-efficacy.
b) **Hypothesis (H_2)**: Perceived risk and trust, banking inclusion, perceived usefulness and awareness in the electronic banking system significantly affect WhatsApp banking adoption.
c) **Hypothesis (H_3)**: Awareness of mobile banking platforms is experienced differently across the various channels.

1.7 Significance of the study

This study aimed to contribute to the expanding body of knowledge on digital platforms that serves as a basis for promoting financial inclusion in the South African context. South Africa is well-known for its various chronic economic challenges, such as inequality, poverty and high unemployment (Biyase and Zwane, 2018). At the same time, the country is commended for having a well-developed financial industry that offers a comprehensive assortment of financial services (Makrelov et al., 2021). Financial inclusion is important for ending poverty and boosting economic growth, but it isn't getting enough attention in South Africa (Matsebula and Yu, 2020).

Access to financial services is seen as one of the most important challenges affecting communities globally before and during the COVID-19 outbreak (Yan et al., 2021). In this context, mobile banking technologies such as WhatsApp banking are critical in enabling financial inclusion to allow more communities to access banking services (Abdulquadri et al., 2021).

In the banking industry, like in other businesses, technology has become the primary driver of change (Alt et al., 2018) because technology allows banks to serve their clients better while reaping significant rewards for themselves (Boot et al., 2020). According to Gupta and Xia (2018), banks are witnessing a paradigm change in their business practises. Financial institutions are embracing technology and innovation to provide improved services to their consumers to stay relevant and competitive (Das, 2020).

According to Carter (2018), mobile banking, chat banking, Internet banking, telephone banking and automated teller machine (ATM) banking have emerged as new ways for banks to reach out to consumers. Understanding electronic banking is critical for the survival of banks as customers are seeking new cheaper ways of baking simpler, convenient and faster (Sathiyavany and Shivany, 2018). Financial inclusion improves daily life and assists families and companies in planning for anything from long-term objectives to unforeseen crises (Etemad, 2020).

1.8 Delimitations of the study

According to Theofanidis and Fountouki (2018), delimitations are, in essence, the constraints voluntarily imposed by researchers to keep the study's aims and objectives within reach. Defining boundaries may be claimed to be within the researcher's power (Theofanidis and Fountouki, 2018). As a result, delimitations are primarily concerned with the study's theoretical background, objectives, research questions, variables under analysis and research sample (Ellis and Levy, 2009; Leedy and Ormrod, 2019).

There are numerous factors influencing financial inclusion; however, due to scoping constraints, this research only focused on customers (specifically those living in Johannesburg) because of the seemingly enormous impact that access to banking has on people throughout South Africa. This study's focus on the chosen topic (financial inclusion through WhatsApp banking in Johannesburg) limits the possibility of investigating other issues:

a) The study is limited to respondents from Johannesburg, South Africa only, and financial inclusion is a global issue.
b) The study focused on financial inclusion through WhatsApp banking. Several FinTech products could allow more people to access financial services or products.
c) Individuals that received the request to participate in the study but did not consent to complete the survey were excluded.

d) The study only uses some of the TAM constructs. Other variables from the original TAM are not used in the modified TAM for WhatsApp banking adoption in this research.
e) This study used the TAM as the theoretical grounding of the study. Other theoretical frameworks could be used as well.
f) The study was exploratory.

1.9 Assumptions of the study

The following assumptions were made:

a) The sampled respondents reflected a representative sample of all South African customers eligible to open a bank account.
b) The information provided by respondents was open and honest.
c) The sample size was statistically significant to get data reflective of South Africa.
d) Using the TAM theoretical model is both relevant and appropriate for the investigation.
e) The constructs used in the modified TAM for the adoption of WhatsApp banking is both relevant and appropriate for the investigation.

1.10 Theoretical grounding of the study

This study used the TAM as the theoretical grounding, discussed in the subsequent sections.

1.10.1 The theoretical research model

The suggested conceptual model, as illustrated in Figure 4, provides the constructs advocated within the novel TAM (Davis, 1985). Though, it adds two external factors to perceived ease of use (PEOU), namely perceived self-efficacy and mobile connection quality, and the variable awareness of mobile banking advantages, as an external variable to perceived usefulness. Furthermore, two factors are added to evaluate their impact on customers' attitude and behavioural intention towards WhatsApp for banking activities (Davis, 1985).

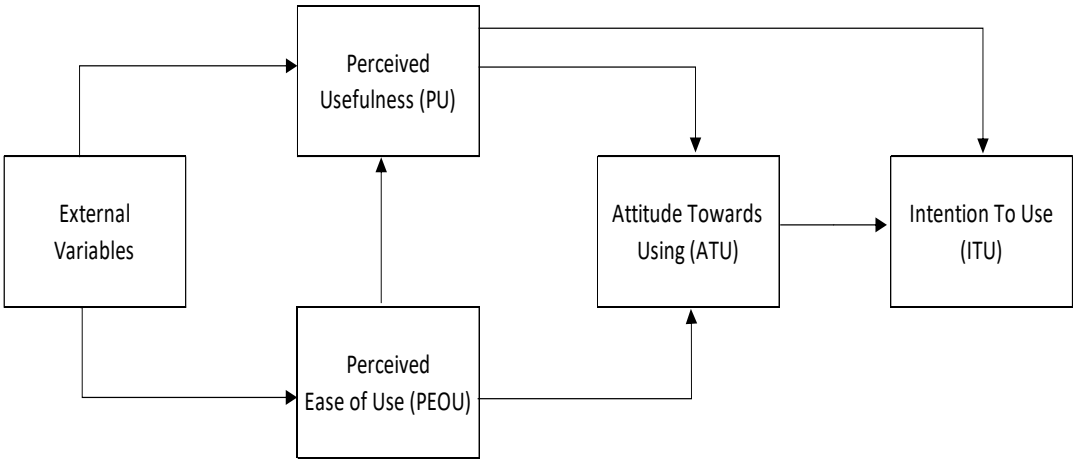


Figure 4: Original Technology Acceptance Model (Davis, 1985)

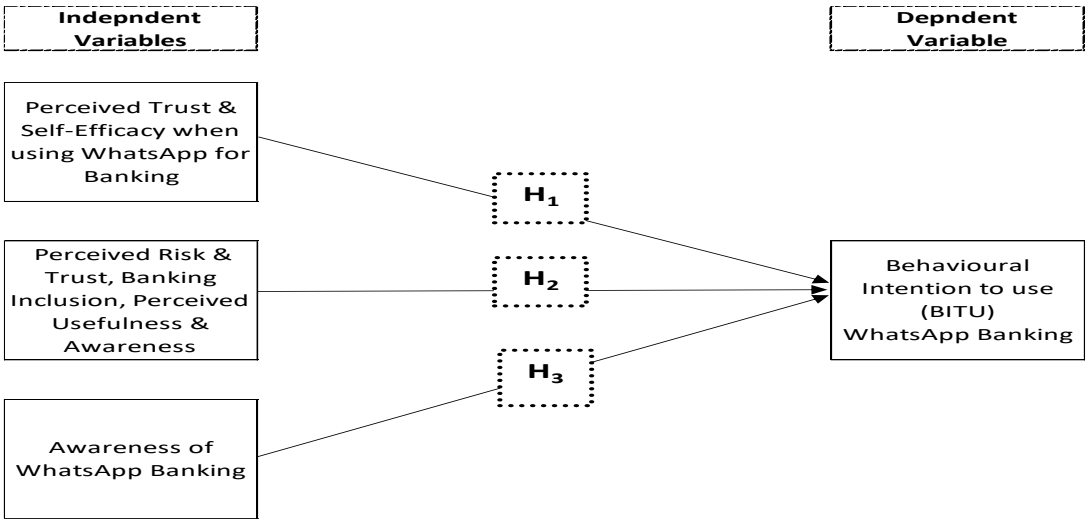


Figure 5: TAM conceptual research model (Modified from Davis, 1985)

The modified TAM, as illustrated in Figure 5, was used to research the main factors affecting the intention to use WhatsApp for banking. This is a modified version of the original TAM (Davis, 1985).

The original TAM was modified by Kesharwani and Bisht (2012) to include a new construct, perceived risk, in addition to the traditional TAM constructs of ease of use and usefulness. Encouraging organisations to focus on the critical challenge of providing a safe and secure virtual environment enables customers to utilise electronic banking services fully. Globally, online banking services raise concerns about risk (Kesharwani and Bisht, 2012).

Perceived risk is the consumer's perception of the uncertainty of outcomes related to product and/or service before purchase or use (Kesharwani and Bisht, 2012). These services are vulnerable to security and privacy threats like phishing, malware, spyware, spoofing and password sniffing because they operate in an open environment (Prasad and Rohokale, 2020). According to Chiu et al. (2014), customers will perceive a higher risk if there is a discrepancy between their actual buying experiences and their desired buying goals.

The hypotheses formulated based on the above conceptual framework are listed in Section 1.6

Table 1: Variables in the modified TAM

Variable	Variable Type	Definition	Model	Source
Perceived Risk & Trust	Independent Variable	Perceived risk refers to a consumer's perception of the uncertainty of outcomes when searching for and selecting product and/or service information prior to making a purchase decision.	Modified TAM	Kesharwani and Bisht, 2012
Awareness	Independent Variable	Awareness of a technology and its benefits. This is an important component in deciding whether or not to adopt it.	Modified TAM	Kesharwani and Bisht, 2012
Perceived Usefulness (PU)	Dependent Variable	The degree to which people believe a technology would be useful is referred as PU.	TAM	Davis, 1985
Perceived Ease of Use (PEOU)	Dependent Variable	PEOU is defined as the degree to which people believe technology is simple to use.	TAM	Davis, 1985
Behavioural Intention to Use	Dependent Variable	An individual's interest in, motivation for, or readiness to exert effort to use technology.	TAM	Davis, 1985
Actual System Use	Dependent Variable	Using the technology for its intended purposes.	TAM	Davis, 1985

1.11 Alternative theoretical research models not used in this study

1.11.1 The Unified Theory of Acceptance and Use of Technology

The Unified Theory of Acceptance and Use of Technology framework proposed by Venkatesh et al. (2003) is popular and extensively used to forecast behavioural intention for technology adoption. Venkatesh et al. (2003), illustrated that customer usage intentions are likely to be predicted by performance expectations, effort expectancy, social influence, facilitating conditions and planned behaviour. This model could also assist in getting a better understanding of a customer's behavioural intention to utilise WhatsApp banking. For my research I opted to only use the Technology Acceptance Model, as it was suitable for my study.

1.11.2 Theory of Planned Behavior

The Theory of Planned Behavior is a subcategory of the Theory of Reasoned Action (Ajzen and Fishbein, 1975; Fishbein and Ajzen, 1980). Both models assume that people make rational, reasoned decisions about what to do based on the information they have. Value placed on a behaviour, ease of performance, perspectives of significant others and perception of control determine an individual's intention to engage in that behaviour (Ajzen, 1991; 2005; 2011). For my research I opted to only use the Technology Acceptance Model, as it was suitable for my study.

1.12 Definition of terms

The following section presents definitions of significant keywords and concepts used throughout the research.

Table 2: Definition of terms

Concept	Definition	Source
Financial Inclusion	To be included in the financial system, an individual or a business must have access to useful and affordable financial products and services that meet their needs (transactions, payments, savings, credit, insurance). It includes financial access, financial ability and participation in the financial system; appropriate and accessible products; and formal financial sector indicators, such as the number of ATMs per person or the accessibility of bank service points.	Demirgüç-Kunt and Klapper, 2018; World Bank, 2013
Mobile Banking	Mobile banking is when a consumer connects to a bank using a mobile device such as a phone, smartphone or tablet. It is distinct from mobile payments, which utilise a mobile device to pay for purchases at a store. Mobile banking is easier and faster than traditional banking at a branch or on a computer.	Laukkanen, 2017
WhatsApp	It is a mobile application that uses the user's existing Internet data plan to enable users (both individuals and businesses) to connect.	WhatsApp, 2022
Mobile Money	Mobile money is a relatively new idea that offers financial transaction services through mobile phones, including to the world's unbanked poor.	Aron, 2018
FinTech	Financial technology (FinTech) is the use of technology to deliver new, innovative financial products and services.	Mention, 2019
Spaza Shops	A business in a part of a home that is occupied or any other structure that stands in a town where people live permanently.	Ligthelm, 2008

1.13 Chapter summary

The chapter provided an overview of the study's objectives as well as the topic's contextual background. The research problem that motivated the study was also discussed. Furthermore, the research objectives that the study aimed to achieve were listed. The study's significance was explained, along with the rationale for conducting the research. The key terms used in this study have been listed. The assumptions were defined, and the study's delimitations and limitations were

revealed. The original TAM and the modified version were described together with the model's dependent and independent variables. The chapter was concluded with alternative theoretical models that could be used to determine behavioural intention for people to start using WhatsApp banking. The next chapter looks at previous research and reviews the literature on some of the concepts that have been outlined, which helps to define the gap in the literature that this study desires to fill.

2 CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter looks at relevant and accessible literature on financial inclusion, considering the concepts important to this study, starting with defining the customer. The next step will be to define what mobile banking is. Then there's WhatsApp banking, which could help people gain better access to financial services. Following that, a rundown of mobile messaging services is provided, and WeChat banking as a form of chat banking is considered. Furthermore, the chapter examines financial inclusion and the banking industry in South Africa and discusses the rapidly expanding mobile market. Finally, gaps in the literature are identified.

2.2 The development of mobile banking

2.2.1 Defining mobile banking

Mobile banking has become a difficult concept to define, with scholars often disagreeing on its description. According to Muzurura and Chigora (2019), mobile banking is an innovative way for customers to interact with financial institutions using a mobile device at any time and from any location. Mobile banking or payments, according to Fenu and Pau (2015), is the use of mobile devices such as cell phones, personal digital assistants and pagers to connect to a bank's network via wireless networks. According to Kim et al. (2009), consumers use smartphones or other mobile devices to conduct bank-related transactions such as viewing account information, sending money and trading stocks. Lin (2013), on the other hand, describes mobile banking as a combination of telecommunication networks and banking infrastructure that banks use to reach underbanked people and make banking easier for everyone.

2.2.2 Mobile banking in Sub-Saharan African

According to Myovella et al. (2020), the mobile banking market in SSA is expected to grow rapidly, taking us from cash to electronic payments. Recently,

communication technology has assisted innovations in financial intermediation in developing countries (Boot et al., 2020). As a result, several countries in SSA now accept mobile payments (Koomson et al., 2021). According to Muzurura and Chigora (2019), mobile banking in SSA has expanded to include supermarkets, telecoms and insurance companies.

The mobile banking app can be used to apply for insurance as well as pay bills (Pestovska, 2021). According to Asongu (2018), customers can access demand deposits and savings via SMS, unlike traditional banks. Unlike in developed countries, mobile banking in SSA benefits and transforms rural consumers (Asongu, 2018). Mobile payments between individuals, businesses and governments have just about replaced cash, ATMs, debit/credit cards and cheques in many cities in SSA (Alemu et al., 2021).

2.2.3 Mobile banking in South Africa

According to Koech (2012) and Asongu (2018), many countries in SSA, including South Africa, have more mobile phone subscribers than bank accounts. South Africa has a high percentage of households with bank accounts (51% to 80%), which works against any plans to convert traditional banking services to mobile money. According to Fernandez and Fernandez (2021), South Africa is the continent's second-largest mobile market, with a much higher mobile penetration rate than the rest of West Africa. According to Thusi and Maduku (2020), mobile banking in South Africa bridges the gap between banks and the poor by facilitating transfers, savings and investments.

According to Wei and Lu (2014), The Internet and mobile technologies have permeated every aspect of daily life in South Africa. They claim that these technologies have also changed people's lives and habits. Koenaite et al. (2019) noted a low penetration of digital banking in South Africa despite its many advantages for banks and their clients. Mobile banking technology may improve the customer experience while increasing bank efficiency (Malaquias and Hwang, 2016). In South Africa, researchers say mobile banking improves financial

opportunities, simplifies banking and controls money operations (Chigada and Hirschfelder, 2017).

2.2.4 Mobile banking service offerings

Mobile banking has become widespread, and both young and old are seen using phones daily (Mupfiga and Padare, 2017). There are three categories of mobile banking services: payment, banking and value-added services (Chawla and Joshi, 2018). These services enable consumers to send and receive money electronically, purchase goods online (such as electricity and airtime) and gain access to financial data (e.g., bank statements) (Mswell, 2020). Mobile banking adoption is being fuelled by affordability and accessibility. Additionally, mobile banking adoption is associated with owning a bank account (Pankomera and van Greunen, 2018).

Mobile banking applications benefit both the user and the provider by facilitating portability, lowering labour costs, increasing convenience, expanding consumer reach, enhancing security and facilitating accessibility (Eckhardt et al., 2009). These advantages enable this mode to deliver banking services. For example, Mbiti and Weil (2015) assert that instant money transfer, security and low cost drive the finance sector and digital economy forward.

2.2.5 Mobile messaging services

Mobile messaging is typically accomplished by using a phone or other mobile device (Wang, 2019). SMS (Short Message Service) texting, Multimedia Messaging Service and several wireless access protocol mobile messaging services such as WhatsApp, WeChat, Telegram, Line and Viber are all available for download and use on various mobile platforms (Wang, 2019). According to Presti et al. (2021), the following messaging services are among the most popular international messaging applications: WhatsApp, Viber, WeChat, Telegram and Line.

2.2.6 Benefits of mobile banking

Banks can increase profitability, lower financial intermediation costs, limit risks, benefit clients and participants, and strengthen existing business models and

platforms (Mirchandani et al., 2020; Wang et al., 2021). New business models and platforms may increase risk management, customer satisfaction and service efficiency Wang et al., 2021). A relationship between banks and FinTechs may benefit both parties due to their diverse market expertise and services. Banks provide tremendous expertise and understanding of consumer behaviour, financial services, credit modelling and segment activity to the collaboration (Mirchandani et al., 2020). FinTechs may help accelerate innovation by providing venues for prototyping and piloting (Mirchandani et al., 2020).

According to Mirchandani et al. (2020), working with FinTechs to create mobile banking platforms can increase regulatory compliance, cut expenses and improve customer service. Profitable bank-FinTech collaboration requires regular evaluation of changing client demands and innovative technology or commercial solutions (Mirchandani et al., 2020).

2.2.7 Mobile banking technology risks

According to Chopdar et al. (2018), mobile technology might raise risks but also create new possibilities. Banks must maintain and enhance security measures to combat cybercrime and money laundering threats. However, improved business models and new services from collaborations improve the consumer experience. Moussavou (2020) suggests that restructuring business models or combining these capabilities may help banks adapt to shifting financial markets. Drasch et al. (2018) discovered that banks want access to FinTech companies' new technology. Using cutting-edge technology may improve customer service, product quality and operational efficiency.

2.2.8 Mobile data costs in South Africa

Given that over 50% of South Africa's population, or over 28 million individuals, live below the upper-bound poverty line of R1 227 per person per month (StatsSA, 2019), it is critical to consider the cost of mobile data when considering mobile banking, putting the cost of mobile data into perspective with WhatsApp. South Africa ranks 95th out of 230 nations for mobile bandwidth; 1GB costs R39,47 or

$2.97. This ranks South Africa near Jamaica (94th) and Lesotho (96th) (Figure 6) (Cable.co.uk, 2021). The cost of data and access to data might impact the use of WhatsApp banking.

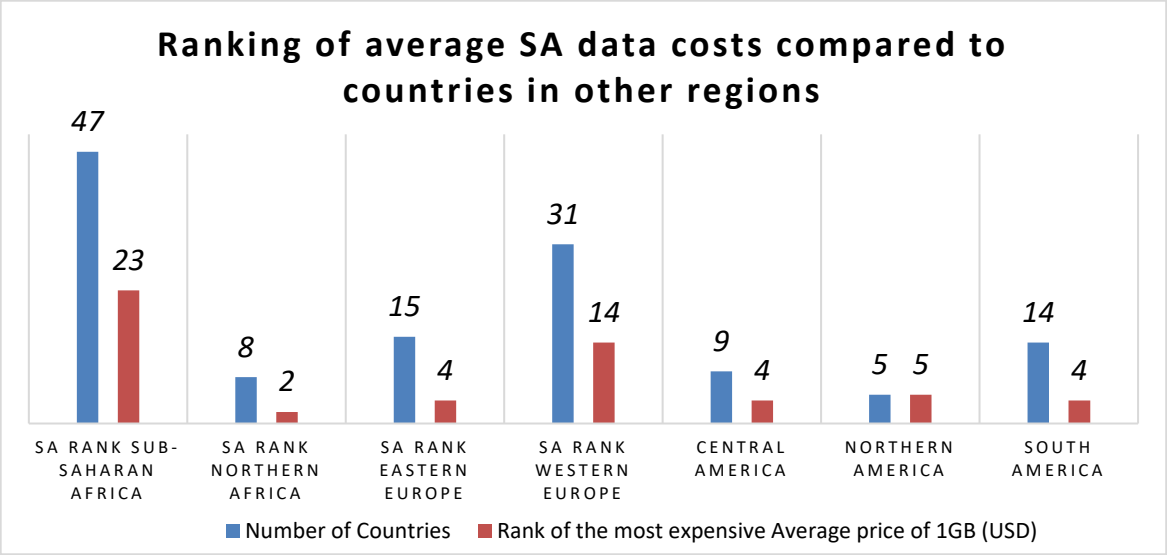


Figure 6**: Worldwide mobile data pricing 2021 ranking average South African (SA) data costs** (Source: Cable.co.uk, **South Africa's data costs are high compared to other countries in different regions (the ranking starts from 1 being the most expensive) (Figure 6), impacting WhatsApp banking because WhatsApp is not a free service in South Africa.**

2.3 Chat banking

2.3.1 WhatsApp banking

WhatsApp is a cross-platform messaging app that allows users to communicate without paying for SMS (WhatsApp, 2022). The app runs on Android, IOS and Windows supported smart devices, supporting private and group chats as well as sending and receiving video and audio files. In October 2021, WhatsApp had two billion active monthly users. The app is one of the most popular mobile social apps worldwide, with a strong reach and usage penetration outside the United States of America (StatsSA, 2021c).

According to Techpoint.africa (2018), WhatsApp banking is an extension of chat banking, available on Facebook. Techpoint.africa (2018), went on to say that because WhatsApp is Africa's most popular messaging platform, it gives banks a

wider reach than Facebook Messenger. In July 2018, ABSA launched WhatsApp banking for the first time (BusinessTech, 2018). At the moment, some Nigerian banks provide access to financial services through WhatsApp (Techpoint.africa, 2018), among them are United Bank for Africa, First Bank of Nigeria, Guaranty Trust Bank (GTBank), Access Bank and Zenith Bank. In the case of Zenith Bank, this is referred to as Qwerty Banking Customers can use the Zenith Bank keyboard interface in the bank's application to make banking transactions on mobile messaging applications (Techpoint.africa, 2018).

According to Katie (2020), more and more Brazilians are comfortable managing their money through WhatsApp. Banco Bradesco (a Brazilian Bank) said in their 2019 financial report that 3.5 million people had used WhatsApp to communicate with them (Katie, 2020).

2.3.2 WeChat banking

WeChat is a Chinese mobile app developed by Tencent (Rong, 2016). WeChat was released in January 2011, exceeding the team's expectations. Smartphone users can use WeChat to send messages, play games, send images and videos, and share their location with friends (Sharif et al., 2021).

WeChat, one of China's most popular social networks, is quickly emerging as a major business platform (Sharif et al., 2021). WeChat mall is a social electronic commerce platform growing in popularity as WeChat is used more and more (Matemba et al., 2018). According to Matemba and Li (2018), customers can use WeChat to make product inquiries, purchase items, interact with one another, place orders and pay for items both online and offline. According to Rong (2016), a WeChat wallet is a payment function of the WeChat client that allows users to complete payments via their smartphones. Rong (2016) further notes that customers only need to add a bank card to their WeChat wallet and enter the required information, after which they can use the app whenever and wherever they want.

2.4 The banking industry

2.4.1 The banking industry overview

There are multiple banks in South Africa. According to BusinessTech (2021), the five big banks in South Africa are ABSA, Capitec, FNB, Nedbank and Standard Bank. Traditional banks play a vital role in the economy. Banking systems store consumer deposits (Kaur et al., 2021). Deposit accounts are viewed as safe, liquid claims that can be redeemed at will. Nonbanks (non-depository) cannot offer the same deposit accounts as banks (Agarwal and Zhang, 2020). According to Boot et al. (2021), banks make their money by charging fees for services that have low risk. Insurance, wealth management, payments and consulting services are typical examples. Nonbanks can also provide these services. As a result, niche competitors seek to recruit the same clientele as banks.

Financial institutions have invested in digital infrastructure, software and big data centres. With complex infrastructures and outdated systems, banks have to adapt slowly. While technology changes swiftly, infrastructure and applications cannot. It is important to understand the risks involved with technology transformation, as well as the interaction between technical and organisational culture (Krasonikolakis et al., 2020).

2.4.2 Banks and disruptive technology

The financial services industry is continually developing and disrupted by new technologies. While technology is used to develop new services, they also generate new rivals for established banks (Goldstein et al., 2019). As a consequence, banks face challenges. In the past, banks have innovated and changed with technology, from ATMs to online banking. Technological change and the fast emergence of technology-based businesses provide new challenges to banks (Goldstein et al., 2019; Wonglimpiyarat, 2017).

Banks must invest in several areas of technology to discover effective and creative solutions for retail clients. New technology may impact consumer finance,

insurance, mortgages, savings and retail payments and these are vital sectors for banks. Customers want simplicity, reasonable costs, openness and easy access to services (Krasonikolakis et al., 2020). Anagnostopoulos (2018) suggests new customer-centric solutions, including mobile wallets, Insurtech services, investing tools and analytics.

2.5 Financial inclusion

2.5.1 What is financial inclusion

According Abor et al. (2018) financial inclusion is a process that assures that all individuals of an economy have easy access to and use the official financial system. There are various advantages to having an inclusive financial system. It allows for more effective use of productive resources, potentially lowering the cost of capital. Furthermore, having access to effective financial services may considerably enhance day-to-day financial management. An inclusive financial system can reduce the proliferation of informal loan sources (such as money lenders), which are frequently exploitative. Thus, an all-inclusive financial system improves efficiency and welfare by permitting a wide range of efficient financial services and providing pathways for secure and safe saving practises.

2.5.2 The digital era and financial inclusion

The digital era has triggered a disruptive shift in the financial sector, enabling financial institutions to reach previously unbanked or underbanked people in developed and developing countries while keeping current conventional bank customers. Digital financial services, which provide new financial technologies that allow more people to access financial goods and services, have emerged due to digitalisation (Alexander et al., 2017).

2.5.3 South African National Treasury on financial inclusion

The National Treasury of South Africa (2020) notes that South Africa's headline statistics on financial inclusion reflect favourably on the country's progress in increasing financial inclusion. Roughly 2.9 million South Africans are still not

officially enrolled in the country's banking system. Approximately 81 per cent of individuals have a bank account, 78 per cent utilise other non-banking channels, and about 61 per cent still use informal channels. Suppose the approximately 5.3 million South African social grant recipients are removed, just 68 per cent of people will be deemed as banked. However, utilising financial services still has major underlying issues.

How financial services are used and the lack of access to some financial services are obstacles. Low-income people do not interact with financial institutions conveniently, and products and services are not tailored for their needs. Reckless financial service providers have hurt many individuals who should be helped by the financial industry. Consequently, small, micro and medium enterprises are barely serviced, and the quality of life and economic environment of low-income South Africans has not improved (National Treasury of South Africa, 2020).

2.6 Financial technology

2.6.1 What is a financial technology

FinTech is a phrase used often in recent financial studies, describing the application of emerging, innovative technologies to finance. It is essentially using disruptive technologies to provide financial services, surging in the 2010s (Haddad and Hornuf, 2019). FinTech provides investors with effective support by offering innovative and secure financial services. Another factor for the rise of FinTech is the demand for more low-cost financial services with flexibility and speed (Anikina et al., 2016). The Global Financial Crisis of 2008 was the main driver of FinTech (Haddad and Hornuf, 2019). During this crisis, individuals lost faith in the financial system and sought other means of investment assurance. The severity of the 2008 financial crisis has paved the ground for an Islamic financial system as a vehicle for recovery (Askari et al., 2011).

FinTech is popular because FinTech technologies are relevant today, as opposed to prior financial applications (Rupeika-Apoga et al., 2018; Thalassinos et al., 2015a; Thalassinos et al., 2015b). These inventions convincingly alter people's

living conditions and substantially contribute to the lives of unbanked and underbanked individuals in South Africa (Schindler, 2017).

Schueffel (2016, p. 32-54) offers a helpful, integrated and comprehensive definition of FinTech: "An innovative financial sector that uses technology to enhance financial activities." Board (2017) prefers the following definition: Technologically enabled financial innovation that may result in new business models, applications, procedures, or products with massive consequences for financial markets and institutions and financial services.

2.6.2 Segments and elements of FinTech

Finance, asset management, payments and other FinTechs are the four major categories of FinTech components, according to Dorfleitner et al., 2017). The current study focused mainly on alternative payment methods due to their significance to the research and the present economic climate. Figure 5 depicts the segments described in the synopsis.

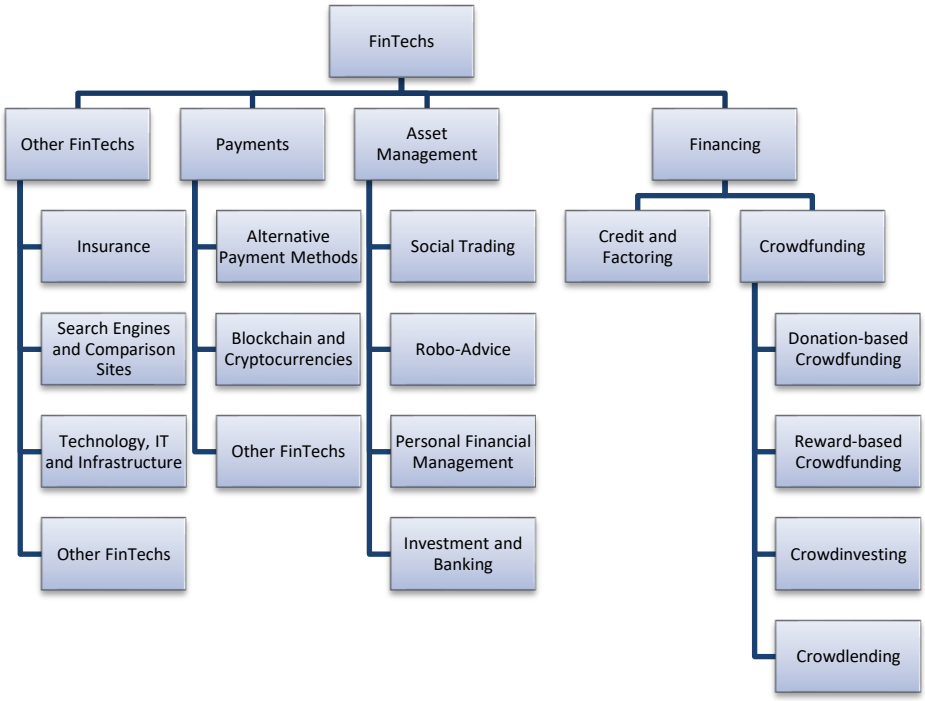


Figure 7: Segments of the FinTech industry (Source: Dorfleitner et al., 2017)

2.6.3 FinTech alternative payments

Online payment solutions provided by FinTech start-ups are referred to as alternative payment methods. Such platforms necessitate a mobile device with an Internet connection and enable users to perform smooth peer-to-peer money transfers and payments that are fast and, in most cases, free or at a reasonable cost. Furthermore, the advent of these services has influenced consumer behaviour, with customers now preferring digital channels when dealing with money transactions rather than contacting financial intermediaries (Thompson, 2018). People who work in the financial industry are under pressure to shift their attention to online platforms, even though the barriers to getting in are very high.

2.7 Conceptual framework

2.7.1 Consumer and Technology Adoption Model

The TAM is the first paradigm to describe and forecast user acceptance of information technologies (Davis, 1985). The TAM is widely recognised as a framework for expressing a user's determination to utilise technology (Akturan and Tezcan, 2012). User attitudes are influenced by perceived usefulness (PU) and PEOU (Davis, 1985). TAM is a popular model in the research of mobile money adoption in Africa (Chigada and Hirschfelder, 2017). Despite other frameworks, the TAM is considered the most reliable approach for analysing technology uptake (Adams et al., 2007; Venkatesh et al., 2003; Wentzel et al., 2013). However, Bagozzi (2007) contends that the TAM fails to include collective, social and cultural dimensions of technology adoption.

Prabowo et al. (2020) state that a TAM is a model that academics use to anticipate and analyse the variables that affect a person's interest in a certain technology. The TAM is widely regarded as the most important and extensively used theory in the area of information systems, and it has gained extensive empirical support (Lee et al., 2003). TAM is based on the theory of coherent action, which investigates how attitudes influence behaviour (Belief and Ajzen, 1975). TAM includes two main predictors: PU and PEOU, and the dependent measure, action intention. Since the

introduction of the TAM model in 1989, researchers have used it in various study areas. Some studies concentrated on determining the determinants of important variables, such as ease of use and PU (Karahanna and Straub, 1999). Some studies increased the prediction potential of the TAM by including additional theories (Dishaw and Strong, 1999; Gefen, 2004; Venkatesh et al., 2003).

2.8 Factors that enable consumer adoption of mobile banking

2.8.1 Perceived ease of use

The TAM and its variations believe that PEOU and PU operate together for technological adoption. Davis (1985) defines PEOU as an individual's belief that using the system would be effortless. Clients will see easy-to-use banking mobile services as less complicated (Davis, 1985; Priya et al., 2018; Venkatesh et al., 2003). PEOU allows people to easily access mobile banking technologies and services (Priya et al., 2018) and has a strong influence on views about mobile banking (Chuang et al., 2016; Wentzel et al., 2013). Customers are more inclined to use mobile banking if it is simple to use and comprehend (Pandiya and Gupta, 2015).

2.8.2 Self-efficacy

This concept explains customers' perceived confidence in using technical innovations (Koksal, 2016). Self-efficacy in mobile banking refers to clients believing they have the necessary knowledge, skill, or capacity to utilise a new service. Self-efficacy and mobile banking adoption have previously been linked (Alalwan et al., 2015; Koksal, 2016; Lee et al., 2003; Maduku, 2017; Makanyeza, 2017).

2.8.3 Perceived usefulness

PU is the degree to which a person feels that employing technology, in this instance, mobile banking services, would benefit them. Individuals initially analyse the repercussions of their actions before deciding based on PU (Kim et al., 2009). Build it and they will come is a classic example of a lack of PU and customer-centricity.

Customers' increased need for customisation and personalised services may be a factor in PU. PU is the most acknowledged element in the literature that facilitates mobile banking adoption. It affects views about mobile banking (Chuang et al., 2016; Wentzel et al., 2013), mobile banking (Ismail and Masinge, 2011; Pandiya and Gupta, 2015; Singh and Srivastava, 2018) and mobile payment systems (Ismail and Masinge, 2011; Kim et al., 2016).

2.8.4 Perceived trust

According to Dapp et al. (2014) and Wentzel et al. (2013), customers will continue to trust institutions with their funds because they are confident in transaction security. Westfall et al. (2019) and Zhou (2011) suggest that organisations that can provide clients with long-term data security assurance would have the greatest growth and income potential. Due to the high level of security concerns and low switching costs, mobile banking adoption requires early user self-confidence (Singh & Srivastava, 2018; Zhou, 2011).

2.8.5 Perceived awareness

Al-Somali et al. (2009) define mobile banking awareness as knowledge of the system's presence and advantages. Amin et al. (2008) stated that it is the level of knowledge that customers have regarding mobile banking. Consumers appear to prefer avoiding ambiguity over maximising the value and advantages of services (Mitchell, 1999). Perceived risk linked with technology services may impact behavioural perception and environmental control (Pavlou, 2003), while lowering perceived risk may boost electronic commerce applications (Wafa, 2009). It is noticeable that raising awareness regarding the usage and advantages of technology will reduce perceived risk.

Several studies have shown that PU and information about online banking were the key elements affecting bank customers' acceptance of Internet banking (Al-Somali et al., 2009; Howcroft et al., 2002; Pikkarainen et al., 2004). Al-Somali et al. (2009) demonstrated the direct impact of online banking awareness on PU and

convenience of use. This means that how banks promote mobile banking is very important to how many people use it.

2.8.6 Perceived risk

Risk, both real and perceived, is critical to the acceptance and usage of mobile banking (Chigada & Hirschfelder, 2017). The Deutsche Bank FinTech Report (2014), highlights the growth of cybercrime and data abuse occurrences; customers are becoming more cautious while using digital channels to access financial services. Identity theft, phishing, hacking, malware, data breaches and SIM swaps are frequent in banking (Dapp et al., 2014).

2.8.7 Perceived cost of use

Perceived cost is defined by Ismail and Masinge (2011) as the extent to which a person believes using m-banking costs money. Mobile banking costs can include transaction fees, mobile network rates for delivering data or SMS and mobile device expenses, such as buying a smartphone or a simple feature phone. In both Brazil and Iran, Hanafizadeh et al. (2014) discovered that cost perception is one of the key reasons for not using mobile banking. Perceived cost as a factor in Indian mobile banking has been identified by Pandiya and Gupta (2015).

2.8.8 Financial inclusion

According to Dou and Li (2022), financial inclusion is making affordable financial products and services available to all segments of society, including vulnerable groups such as minorities and low-income individuals. The objective is to provide basic financial products, such as savings, credit, remittance and insurance to excluded rural and urban communities. The Reserve Bank's primary strategy for achieving its financial inclusion objectives is a bank-led, information communication technology model. Delivery methods include mobile phones, handheld devices, branches and ATMs.

2.9 The gap in the literature

Having read and studied the literature in multiple countries, it is evident that WhatsApp banking is a growing form of banking both inside and outside of South Africa (BusinessTech, 2018; Katie, 2020; Techpoint.africa, 2018; Udenze et al., 2020). According to recent research conducted by Techpoint.africa (2018), some Nigerian banks are now offering financial services via WhatsApp. Katie (2020) reported that an increasing number of Brazilians are using WhatsApp to manage their finances. ABSA launched WhatsApp banking (BusinessTech, 2018).

Apart from WhatsApp, another mobile messaging platform used for banking is WeChat. According to Rong (2016), a WeChat wallet is a payment feature built into the WeChat app that lets people make payments with their phones.

Even though there is evidence in the literature that the technology needed to make banking through social media platforms like WhatsApp and WeChat is already available, the following was explored in this study:

a) Customers are unaware that alternative banking platforms, such as WhatsApp and WeChat Banking, exist.
b) Factors such as perceived trust, banking inclusion, PU and awareness influence the likelihood of WhatsApp banking adoption.

Banks should therefore raise customer awareness of services such as WhatsApp and WeChat banking to increase customer activity on these platforms. Additionally, they should educate customers about the security measures in place to foster trust when using these platforms.

2.10 Conclusion of the literature review

This chapter summarised the previously published literature on the research problem and evaluated the literature on financial inclusion with the aid of mobile banking solutions to offer context for the study. Customers may not use WhatsApp for banking purposes unless they have confidence in the platform and proper risk controls, as well as an understanding of the platform and self-efficacy in their own

abilities to utilise it efficiently. The TAM is used to analyse the factors affecting WhatsApp's adoption for banking applications. The TAM is a frequently used conceptual framework for explaining computer-related innovation adoption (Masrom, 2007; Walczuch et al., 2007). Therefore, TAM was used as the conceptual framework for investigating WhatsApp's adoption. PU and PEOU are two characteristics that are thought to be related to innovation and its adoption (Alrafi, 2007; Davis, 1989).

3 CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

Numerous studies have shown that there is a direct relationship between PU, PEOU) and behavioural intention to use new technologies (Basuki et al., 2022). It was necessary to rationalise and validate these factors to fully understand their implications for financial inclusion in the context of WhatsApp banking.

This chapter summarises the research methods and sequential steps used to accomplish the research objectives. There will be a discussion of the literature pertaining to quantitative research. It will address the research methodology, research approach, research design, population and sample, research instrument, and the procedure for data collection, analysis, and interpretation, as well as the limitations, followed by a discussion of validity and reliability and lastly discuss any ethical considerations.

3.2 Research paradigm and methodology

The study was conducted using a quantitative approach. McMillan and Schumacher (1984; 2010) infer that quantitative methods focus on objective measurements and statistical, mathematical, or numerical analysis of data obtained through polls, questionnaires, and surveys, or by manipulating pre-existing statistical data using computing techniques. A questionnaire was used as the primary data collection instrument, and respondents were selected using the survey method.

The research was conducted using an online questionnaire distributed to the University of the Witwatersrand student database via a link attached to an e-mail. The survey was circulated to 27 664 students. My research instrument had 31 questions broken down into 11 categories. The questionnaire took approximately five minutes to complete. Precautions were taken to ensure that the data were collected accurately and that the study's conclusions were reliable. Prior to distributing the final questionnaire, I conducted a pilot phase in which a survey was administered to a small group of respondents to ensure that all questions were

timed, clearly stated and understood by the respondents. Data was collected over 17 days, from the 25th of January to the 19th of February 2022.

3.3 Research design

Runeson and Höst (2009) say a research design is the overall strategy for addressing the research questions generated by the research objectives. The research design determines how participants are chosen, what variables are used, how data is collected and analysed, and how extraneous variability is controlled. No matter how sophisticated the statistical analysis is, the researcher's conclusions may be useless if the research design is flawed. Thus, design choices both constrain and support outcomes (Miles and Huberman, 1994). The research approach was descriptive, and a quantitative approach was used. The quantitative method allows measuring and analysing data from respondents to understand the connection between the variables (Cooper et al., 2006). Adopting this technique reduces bias while collecting and analysing data, which means that if the sample size is big enough, the findings may be generalised to a broader population (Rahman, 2017).

The data for this study was gathered via an online questionnaire. Due to the rising availability of web survey platforms and the convenience with which respondents may complete the survey online, this format has become a popular approach. The advantage of this format is that respondent responses may be designed to automatically download into a database, thus saving time and decreasing data processing errors (Bryman, 2016). Lastly, in the times of the COVID-19 pandemic, online questionnaires are deemed to be the safest.

3.4 Population and sampling

3.4.1 Population

The target population can be a cluster of individuals, events, or objects with some common observable characteristics (Saunders et al., 2009). All respondents in this study were based in Johannesburg. Johannesburg has a population of roughly 4.4

million (MacroTrends, n.d.; StatsSA, 2022). For this study, the assumed total population size was 4.4 million, and the findings may be generalised to a broader population.

3.4.2 Sampling frame and sample

According to Acharya et al. (2013), a sample is a subset of a population chosen to be representative of the whole. A sample was used because the entire population could not be studied. Samples can be classified as probability or non-probability. Sample statistics allow researchers to generalise sample results to the target population. Sampling techniques include simple random sampling, systematic random sampling, stratified random sampling and cluster sampling (Acharya et al., 2013).

A sampling frame is critical in probability sampling because, without it, random sampling from the population of interest cannot address the research problem (Acharya et al., 2013). Generalisations can only be made about the sampled population. Samples taken without regard to probability are called non-probability samples. Probability sampling is preferred because its results can be generalised (Acharya et al., 2013). Quantitative research uses probability sampling to draw statistical conclusions (Sandelowski, 2000). In this method, each participant has an equal chance of being selected (Etikan et al., 2016). During the pre-test phase, a convenient sampling strategy was used to gather more data to refine the survey questionnaire before the actual study.

Participants were chosen by random sampling. Non-probability sampling is used when respondents meet certain criteria (easiness, proximity, willingness) but are not randomly selected (Etikan et al., 2016). These approximations are more robust when the sample is more random (Tillé and Wilhelm, 2017). A random sample ensures that the findings and properties of people across different populations are the same (Connelly, 2013; Steyn and Ellis, 2003).

3.5 Data sample size

A sample is a collection of information gathered from a statistical population using specific data collection methods. Researchers should choose a large enough sample to prevent sampling mistakes (Saunders et al., 2009). Furthermore, the desired level of confidence, the population size to be examined and the type of analysis on the data gathered affect the sample size. I proposed to use a sample size of approximately 100 respondents, and I recorded 516 responses from respondents (Table 3).

Table 3: Count of respondents

Field	Count of Respondents
Male	191
Female	317
Prefer not to say	8
Total	**516**

In research, sample size refers to the number of people in a survey, study, or experiment. Sample size is critical in large population surveys. Because getting answers or results from everyone is unrealistic, you can take a random sample of people representing the population (Malterud et al., 2016).

Using Qualtrics' sample size calculators, 385 respondents were needed to get 95 per cent confidence level and five per cent confidence margin of error results representative of the target population (Qualtrics, 2020) (Figure 8). For factor analysis, a sample size of 100 or more is considered good (Williams et al., 2010).

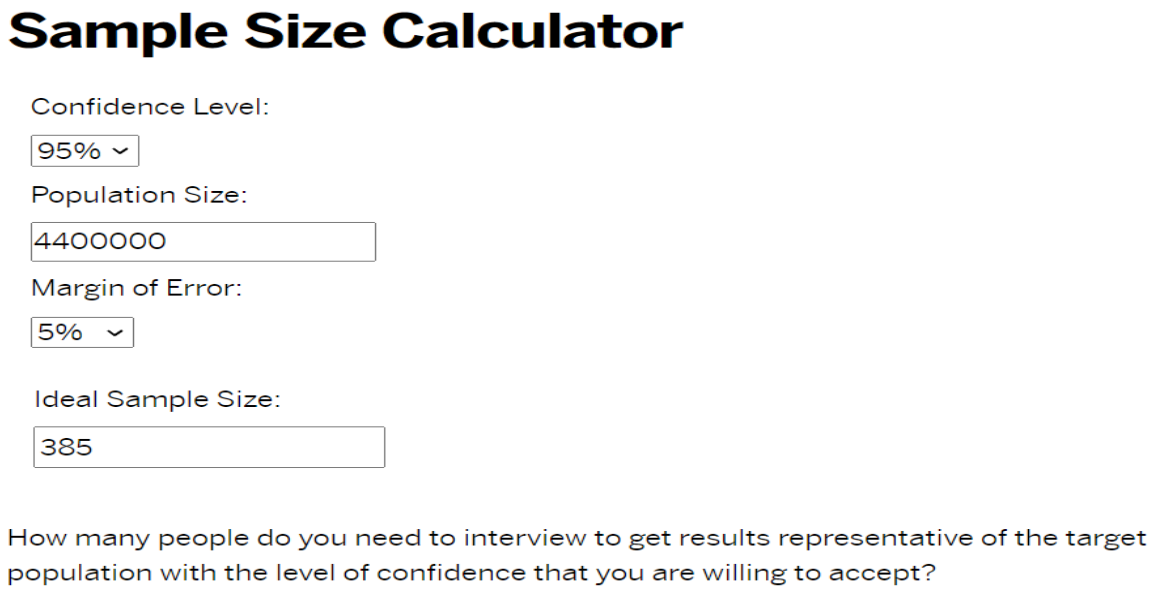


Figure 8: Sample size calculator (Qualtrics, 2020)

3.6 Research instrument

Research instruments are the tools to collect and organise data so that it can be turned into useful information. Ways to do research include the survey, the case study and the experiment. To do a survey, you usually need a plethora of information from many people (called respondents). The data you get usually focuses on their views, ideas and attitudes about the research topic. The case study takes place in a specific place, like a business, and looks at the research question concerning that area. Experimental research tries to determine how an action affects two groups or situations. In most cases, one of the two groups is the control group, and the other is the test group (Wilkinson, 2002).

The survey method was used to gather data via an online self-administered questionnaire to record responses from the respondents (Annexure D). This research instrument enables the researcher to assess the outcome and moderate variables required to answer the research question (Hagan, 2014). The benefits of this instrument include the elimination of interviewer variability because the

interviewer will not ask the same question in different ways, the disadvantage is that respondents cannot elaborate on their responses (Bryman, 2016).

3.7 Data collection procedure

Saunders et al. (2009) define data gathering as a period in the research process when thoughts are established and translated into variables for assessment. A questionnaire was used to collect data for this research. A questionnaire is a data collection technique whereby respondents are asked questions in the same sequence (Runeson and Höst, 2009). For this reason, I used an electronic questionnaire because it works well with structured questions and can be analysed more efficiently and consistently, which is particularly important in descriptive research. The questionnaire was distributed electronically, with a link attached to an e-mail. Data was collected over 17 days, from the 25th of January to the 19th of February 2022. The data was collected using Qualtrics, a web-based software that allows the user to create surveys, distribute them to respondents and generate reports (Qualtrics, 2020).

3.8 Research quality

According to Saunders et al. (2009), the overall validity of research may be separated into two categories: internal and external. Internal validity is described as the study's ability to accomplish what it set out to do, while external validity is the degree to which a study's findings can be generalised to other individuals, circumstances and timeframes. The questionnaire used in this research was well structured and tested, contributing to the study's validity by ensuring that respondents only gave necessary information for evaluation. The questionnaire included all of the elements needed to answer the research objectives and was aligned with the research model.

3.9 Data analysis

Data analysis is a procedure of analysing data via an analytical and logical perceptive to identify each variable. As such, it involves collecting information from

different sources, reviewing it and analysing it to reach a conclusion. The majority of the data collected in this research was quantitative, necessitating descriptive analysis (Rahman, 2017; Runeson and Höst, 2009; Saunders et al., 2009). I used Excel and SPSS Statistics to analyse the data and employ sufficient rigour to test the hypotheses.

3.10 Validity and reliability

When it comes to quantitative studies, validity is defined as how accurately a concept can be measured. Cook et al. (1979), defined validity as the best available approximation to the truth or falsity of propositions, including hypothesised propositions. The second measure of quality in a quantitative study is reliability. Reliability is the extent to which a research instrument consistently has the same results when used in the same situation on repeated occasions (Heale and Twycross, 2015).

3.10.1 External validity

According to Heale and Twycross (2015), external validity seeks to explore whether a study's findings can be generalised to other contexts. Studies are carried out on samples, and if the sampling is random, the sample is representative of the population, so the results can be validly generalised to the population from which the study sample was drawn. However, the findings may not apply to other populations. To ensure that the identity of respondents was kept confidential, the survey was anonymous. Anonymous surveys allow respondents to be more honest (Simon and Goes, 2013). A random sample of 516 responses was collected from respondents to account for any data that may be lost, obtained incorrectly, or recorded incorrectly. To ensure that all respondents understood the questions, complex terms and questions were simplified. The complexity and the duration of the questions were tested during the sampling phase to improve external validity.

3.10.2 Internal validity

Internal validity checks to see if the way a study was planned, carried out and analysed allows for reliable answers to the research questions. Internal validity looks at how much systematic error (bias) there is in a study. This kind of error can happen because of selection bias, performance bias, detection bias and attrition bias, among other things. If the internal validity of a study isn't satisfactory, it can sometimes be fixed, for example, by changing the way the study is done (Egger et al., 2008). This study had a high level of internal validity. It tested the hypotheses and determined the cause and effect of WhatsApp's adoption for banking purposes.

3.10.3 Reliability

Reliability is the degree to which a measurement provides a stable and consistent result (Carmines and Zeller, 1979). Reliability concerns repeatability; for example, a scale or test is said to be reliable if it repeats measurements consistently (Moser and Kalton, 1985). Reliability refers to the consistency of a measuring instrument's parts (Huck et al., 1974). High internal consistency reliability means that scale items measure the same construct (Huck et al., 1974). In internal consistency, the Cronbach Alpha coefficient is commonly used. It is considered the most reliable measure when using Likert scales (Whitley Jr and Kite, 2012). No absolute rules exist for internal consistency. However, most agree on a minimum internal reliability coefficient of 70 (Whitley Jr and Kite, 2012). Reliability assurance was done by testing the research instrument in the trial phase.

3.11 Limitations of the study

The research contributes to solutions to improve access to financial services by unbanked or underbanked communities and how WhatsApp may assist with financial inclusion. The following are the study's limitations that permit future research:

a) It is assumed that only individuals listed on the e-mail with the link to the survey could respond, limiting the number of responses.

b) A list of pre-defined questions was used as the research instrument allowing respondents to choose one of the available options, limiting alternative views from respondents.
c) As all questions were compulsory, respondents may have selected a random answer if they did not understand the question to move forward.
d) The study only focused on WhatsApp banking for financial inclusion. Future studies could include other social media platforms like Facebook, Instagram and Twitter.
e) For future research, I assume that for more complicated new technology adoption, it is important to combine more than one theoretical model to get a better picture of how people use new technology and why it works.
f) People without access to electronic devices (mobile phone or computer) could not do the survey.
g) An online survey was used to gather data. Surveys frequently force respondents into specific response categories, limiting the range of responses (Evans and Mathur, 2018).
h) Respondents could not ask clarifying questions and were limited to the pre-defined questions on the survey.

3.12 Ethical considerations

Saunders et al. (2009) classify ethics as behaviour that governs the researcher's behaviour concerning the respondents. Ethical concerns were considered during this study, from data collection to analysis and reporting. Before administering the questionnaire, written permission was obtained from the respondent. The respondents were given the right to participate voluntarily, confidentiality and anonymity. All information collected was regarded as private in the reporting and was only be utilised to achieve the desired outcome of the research. The Protection of Personal Information Act, 2013 will be another guide towards protecting the respondents' information (South African Government, 2013). Identifying information was not required, like Name and Surname, to protect the identity of the respondents. The data collected was only used for the study. Formal ethics clearance was obtained from the University before data collection started.

3.13 Chapter summary

The research methods used to collect the data are outlined in this chapter. This encompassed the research population, sampling methods and sample size in general. The data collection instrument and the steps used to analyse the collected data were also discussed. In addition, the observed research ethics were identified, and methods for increasing data validity and reliability were highlighted. The research findings will be presented in the following chapter.

4 CHAPTER 4: PRESENTATION OF THE RESEARCH RESULTS

4.1 Introduction

This chapter will address the research questions identified in Chapter 1 as well as their associated hypotheses. Descriptive and inferential statistics were used in this process to identify differences between groups or relationships between the dependent and independent variables.

The first section provides an overview of the research participants' demographic characteristics, followed by the required reliability and validity analysis of the Likert scale questions derived from the data collection instrument. Normality tests determined if the data were normally distributed. In terms of the research questions, the first step was to look for potential differences in trust by age group when self-efficacy was taken into account. The second research question looked at using regression analysis to see how certain factors affect people's adoption of WhatsApp banking, as well as how people's awareness of the main banking transaction platforms differs. Lastly, I summarise the results of my findings.

4.2 Descriptive statistics

According to Mishra et al. (2019), descriptive statistics are used in quantitative research to characterise data and summarise the sample and the measures. Quantitative data is described by measures of central tendency and dispersion.

Descriptive statistics include measurements of frequency (frequency, per cent), central tendency (mean, median and mode) and dispersion (variation, variance, SD, standard error, quartile, interquartile range, percentile, range and coefficient of variation). Frequency analysis is part of statistics that deals with occurrences (frequencies) and percentages (Mishra et al., 2019).

After the data was validated, Qualtrics was used to generate descriptive statistics. The study's demographics included age, gender and employment status. Table 4 provides definitions for the descriptive statistics terms.

Table 4: Definitions of terms for descriptive statistics (Larson, 2006)

Term	Meaning
Frequency Statistics	A data set is a collection of values or scores. In tables or graphs, you can summarise a variable's frequency in numbers or percentages.
Measures of Central Tendency	Central tendency measures are used to determine the centre, or average, of a data set. The mean, median and mode are three methods for calculating the average.
Mean	Identifies the average in a data set.
Median	The value that is exactly in the middle of a data set.
Mode	The most frequent response value in a data set.
Measures of Variability	Variability measures the degree of spread of response values. Range, standard deviation, and variance all express spread.
Range	The range gives you an idea of how far apart the most extreme response scores are.
Standard Deviation	Dataset variability is measured by standard deviation. It shows the deviations from the mean. High standard deviation data sets are more variable.
Variance	The variance is the square of the standard deviation. Variance measures the data's spread. The variance is the difference between the data and the mean.
Covariate	A covariate is a variable that may be used to predict or explain the dependent variable.

4.3 Frequency statistics

4.3.1 Age of respondents

Table 5: Frequency and percentage of respondents' age

Age Group (years)	Frequency	Percentage
Under 18	29	6%
18-24	330	64%
25-34	76	15%
35-44	50	10%
45-54	27	5%
55-64 years old	4	1%
65+ years old	0	0%
Total	**516**	**100%**

The majority of the respondents were aged between 18 and 24 years, which accounted for 327 (63%) of the respondents. The distribution of the respondents was: 29 (6%) respondents were less than 18 years; 327 (63%) respondents were between 18 and 24 years; 79 (15%) respondents were between 25 and 34 years; 50 (10%) were between 35 and 44 years; 27 (5%) respondents were between 45 and 54 years; 4 (1%) respondents were between 55 and 64. No respondents were older than 65 years (Table 5). The age of the respondents is important because it will be compared against other variables to ascertain if there is a correlational relationship between age groups.

4.3.2 Respondents' gender

Table 6: Respondents' gender classification by frequency and percentage

Gender	Frequency	Percentage
Male	191	37%
Female	317	61%
Prefer not to Say	8	2%
Total	**516**	**100%**

Of the 516 respondents, 191 (37%) were male, 317 (61%) were female and 8 (2%) respondents preferred not to indicate gender (Table 6).

4.3.3 Employment status of respondents

Table 7: Respondents' employment status classification by frequency and percentage

Employment status	Frequency	Percentage
Working Full-time	146	28%
Working Part-time	25	5%
Unemployed	39	8%
Student	306	59%
Total	**516**	**100%**

Twenty-eight per cent of the respondents (146) were full-time employed; 25 (5%) were employed on a part-time basis; 39 (8%) were unemployed; 306 (59%) of the respondents were students (Table 7). More than half of the respondents (59%) were students.

4.3.4 Important factors for choosing a bank

Table 8: Important factors for choosing a bank classification by frequency and percentage

Important factor for choosing a bank	Frequency	Percentage
Cost-Saving	125	24%
Saving Time	32	6%
Convenience	132	26%
Security	195	38%
24-hour Availability	32	6%
Total	**516**	**100%**

Most of the respondents, 195 (38%), deemed security the most important factor when choosing a bank or banking services. The second most important factor was convenience, with 132 (26%) respondents selecting this option. This was closely followed by cost-saving, selected by 125 (24%) respondents. Saving time and 24-hour availability of banking channels was considered an important factor by 32 (6%) respondents each (Table 8).

4.3.5 Current platform used for banking

Table 9: Respondents' current banking platform classified by frequency and percentage

Current platform used for banking	Frequency	Percentage
Internet Banking	79	15,3%
Mobile App	382	74,0%
Cell Phone Banking	25	4,8%
ATM	23	4,5%
Branch	7	1,4%
Total	**516**	**100%**

Banking via a mobile app is the most preferred platform to conduct banking, with 382 (74%) respondents using their bank's mobile app; 79 (15,3%) respondents use Internet banking; 25 (4,8%) respondents make use of their cell phone through

Unstructured Supplementary Service Data (USSD) to conduct their banking; 24 (4,5%) respondents use an ATM and 7 (1,4%) respondents visits a physical branch to conduct their banking (Table 9).

4.3.6 Bank of respondents

Table 10: Respondents' primary bank classified by frequency and percentage

Bank of respondents	Frequency	Percentage
ABSA	62	12%
Capitec	163	32%
Discovery Bank	5	1%
FNB	113	22%
Nedbank	33	6%
Other	21	4%
Standard Bank	119	23%
Total	**516**	**100%**

Most respondents bank with Capitec (163, 32%), followed by Standard Bank (119, 23%). Twenty-two per cent (113) of the respondents bank with FNB, and 62 (12%) respondents bank with ABSA. Nedbank and Discovery Bank were represented by 33 (6%) and 5 (1%) respondents, respectively. Twenty-one (4%) respondents selected other, which could be any other registered financial institution in South Africa that was not listed on the survey instrument (Table 10).

4.4 Reliability and validity analysis

This section describes the internal consistency reliability analysis for PU, trust, self-efficacy, banking inclusion and self-awareness.

In quantitative research, validity refers to a concept's ability to be accurately measured. For example, Cook et al. (1979) defined validity as the best available approximation of the truth or falsehood of propositions. Reliability is the second

quantitative quality indicator. Reliability is how often a research tool gives the same results when used in the same way (Heale and Twycross, 2015).

The reliability of Likert scale items is important because every researcher wants to collect accurate and objective data. So, it is necessary to assess the scale's reliability. Cronbach's Alpha is used to estimate the reliability of Likert scale items; it is a measure of a scale or test's internal consistency, expressed as a number between 0 and 1 (Cronbach, 1951). Internal consistency is linked to the interrelatedness of test items (Tavakol and Dennick, 2011). Internal consistency is important, but it's not enough to measure homogeneity or unidimensionality in a test item sample (Cortina, 1993; Green et al., 1977).

Table 11: Reliability statistics

Scale	Cronbach's Alpha	N of Items
Perceived Usefulness	.890	4
Perceived Trust and Risk	.869	4
Perceived Self-Efficacy	.719	3
Banking Inclusion	.818	5
Awareness	.863	3

Table 11 shows all the scales derived from the research instrument. For a scale to be statistically reliable for internal consistency, a Cronbach's Alpha value of 0.70 must be met. All the scales satisfy this requirement. The scale with the highest Cronbach Alpha was PU. The item statistics appear in Annexure A.

Furthermore, construct validity was tested using Pearson’s Correlation Analysis, whereby significant correlations were required as well as correlations that were moderate to strong. Weak correlations can also be included if needed. The correlations are also shown in Annexure B. Based on the correlations found, construct validity requirements were met.

4.5 Normality tests for newly computed variables

Normality tests are crucial for two reasons. First, nonlinearity and interacting physical processes frequently lead to non-Gaussian distributions; therefore, studying the distribution of selected variables can help understand the generating mechanism. Many statistical processes require or are optimal under the assumption of normality, so it is important to know whether or not this assumption is met. The normal distribution, often known as the Gaussian distribution or the bell-shaped curve, is a statistical distribution. In statistics, the normal distribution is characterised by the mean and standard deviation (Yazici and Yolacan, 2007).

The Kolmogorov-Smirnov test was used to determine normality. According to David and Johnson (1948); Massey Jr, (1951); Steinskog et al. (2007), The Kolmogorov-Kolmogorov-Smirnov statistic determines whether a set of observations belongs to a completely specified continuous distribution. The chi-square test is a common alternative. The Kolmogorov-Smirnov test outperforms the chi-square test in at least two ways:

a) It can be used with small sample sizes, where the chi-square test's validity would be called into question (Steinskog et al., 2007).
b) It appears to be a more robust test than the chi-square test for any sample size (Steinskog et al., 2007).

A popular goodness-of-fit test is the Kolmogorov-Smirnov test. It is frequently used, in particular, to test for normalcy (Steinskog et al., 2007).

Table 12: Normality tests

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Perceived_Usefulness	.124	516	.000	.942	516	.000
Perceived_Self Efficacy	.111	516	.000	.951	516	.000
Perceived_Trust	.074	516	.000	.969	516	.000
Banking_Inclusion	.103	516	.000	.960	516	.000
Awareness	.152	516	.000	.906	516	.000

a. Lilliefors Significance Correction

Once the analysis indicated that the constructs were reliable and valid, I computed new scale variables by taking the mean responses for all those items. Table 12 above shows the normality test results. This was done to evaluate whether the variables are derived from a normal distribution. Due to the sample size being greater than 50, I interpreted the Kolmogorov-Smirnov results. The results show that all the variables are not normally distributed, which was considered upon further analysis.

4.6 To ascertain the differences in perceived trust in WhatsApp banking based on age group, after taking into account perceived self-efficacy

For this question, I evaluated if perceived trust in WhatsApp banking differs by age group taking the confidence in one's ability to use the technology into account (self-efficacy). The null hypothesis was that there is no difference in age groups according to trust in WhatsApp banking when adjusted for self-efficacy. I applied analysis of covariance (ANCOVA) to test this hypothesis.

Like the one-way ANOVA (analysis of variance), the ANCOVA compares group means, but it corrects the dependent variable for a covariate (Sadooghi-Alvandi and Jafari, 2013). It must be linear (connection between covariate and dependent variable) and homogeneous (regression between covariate and dependent

variable); the regression lines for each group must have the same slope. An ANCOVA is used to compare two or more treatments when the response variable is dependent on one or more covariates. Also, the variance homogeneity assumption must be met (Sadooghi-Alvandi & Jafari, 2013).

4.6.1 Descriptive statistics – one-way ANCOVA

Table 13: Descriptive statistics – Perceived trust according to age group

Descriptive Statistics

Dependent Variable: Perceived_Trust

How old are you?	Mean	Std. Deviation	N
Under 18	5.2328	1.09978	29
18-24 years old	5.4992	1.09650	330
25-34 years old	5.7303	1.06126	76
35-44 years old	5.5100	1.16820	50
45-54 years old	5.3704	1.16926	27
55-64 years old	4.2500	.00000	4
Total	5.5029	1.10526	516

The descriptive statistics in Table 13 shows that those aged between 25-34 years showed the highest mean (M = 5.7303, SD = 1.06126) while those aged between 45-54 years had the highest variance (M = 5.3704, SD = 1.16926). It is noted that the sample size is unequal; therefore, the test needed to satisfy the homogeneity of variances assumption at least before I continued with the analysis.

4.6.2 Statistical hypothesis testing – one-way ANCOVA with self-efficacy as the covariate and trust as the dependent variable

The one-way ANCOVA is like the one-way ANOVA in that it compares the means between groups. However, it adjusts the dependent variable for a covariate. For this test to be sufficient, it must satisfy the requirements concerning linearity (the relationship between the covariate and the dependent variable must be linear) and homogeneity of regression (the regression lines for each group must have the same

slope). Furthermore, the assumption of homogeneity of variances must also be satisfied (Sadooghi-Alvandi and Jafari, 2013).

Levene (1961) suggested that the differences between the absolute deviations from the group mean for two independent groups might be used to determine variance equality. Table 12 shows the results of Levene's Test of Equality of Variances:

Table 14: Levene's Test of Equality of Variances

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Percei

F	df1	df2	Sig.
2.124	5	510	.061

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + AgeGroup + Perceived_SelfEff icacy + AgeGroup * Perceived_SelfEff icacy

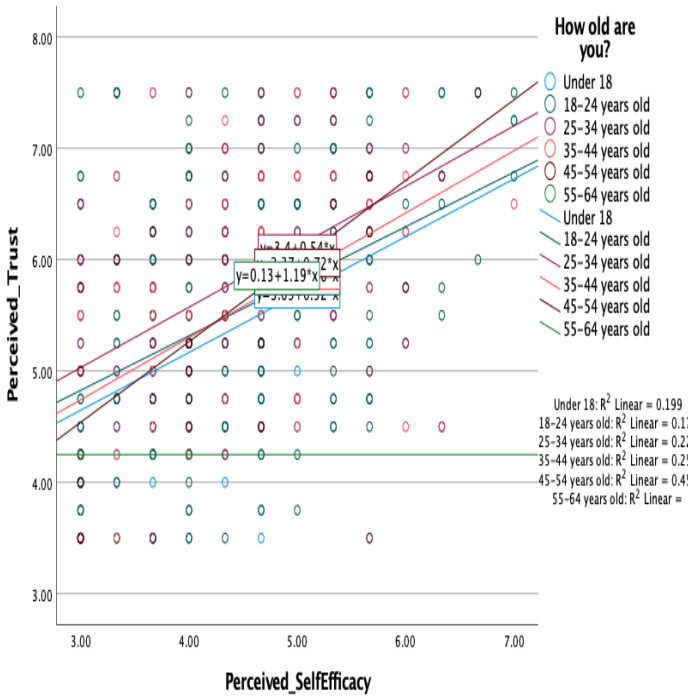


Figure 9: Scatterplot by age group self-efficacy vs trust

According to Graffelman and van Eeuwijk (2005), scatter plots show the relationship between two quantitative or numerical variables by plotting the value of one variable against the value of the other. The *y-axis* in the scatter plot in Figure 9 represents perceived trust, while the *x-axis* represents perceived self-efficacy.

As seen in Table 14, the homogeneity of variances assumption has been satisfied as I obtained a statistically insignificant result (F (5,510) = 2.124, p = 061). Furthermore, the slope on the scatterplot of the dependent variable and the covariate is almost perfectly parallel. There was sufficient evidence for me to continue the ANCOVA as the main assumptions have been satisfied.

Table 15: Test of between-subject effects - ANCOVA

Tests of Between-Subjects Effects

Dependent Variable: Perceived_Trust

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	140.483[a]	11	12.771	13.173	.000	.223
Intercept	21.342	1	21.342	22.013	.000	.042
AgeGroup	1.731	5	.346	.357	.878	.004
Perceived_Self Efficacy	5.572	1	5.572	5.747	.017	.011
AgeGroup * Perceived_Self Efficacy	1.849	5	.370	.381	.862	.004
Error	488.637	504	.970			
Total	16254.625	516				
Corrected Total	629.121	515				

a. R Squared = .223 (Adjusted R Squared = .206)

The results in Table 15 show sufficient evidence for me to accept the null hypothesis that trust in WhatsApp banking is perceived the same across all age groups (F (5,504) = .381, p = .862). Moreover, the effect size for the age groups is small: $\eta^2 = 0.004$, implying a small difference in perception of trust according to age groups. To understand this, I looked at the adjusted means according to the age groups.

Table 16: Adjusted mean estimates

Estimates

Dependent Variable: Perceived_Trust

How old are you?	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Under 18	5.338[a]	.187	4.970	5.705
18-24 years old	5.477[a]	.054	5.370	5.584
25-34 years old	5.751[a]	.113	5.529	5.973
35-44 years old	5.485[a]	.139	5.211	5.759
45-54 years old	5.501[a]	.192	5.123	5.878
55-64 years old	4.250[a]	1.147	1.996	6.504

a. Covariates appearing in the model are evaluated at the following values: Perceived_SelfEfficacy = 4.3282.

Table 16 shows the adjusted means by age group. The means are adjusted for the covariate. After the adjustment, I observed that all age groups still scored trust in WhatsApp banking higher than those aged 55-64. Most of the group means increased when adjusting for the covariate (self-efficacy).

4.7 Analysing the impact that perceived trust, banking inclusion, perceived usefulness and awareness has on WhatsApp banking adoption.

For this question, I wanted to analyse the impact that perceived trust, banking inclusion, PU and awareness has on WhatsApp banking adoption. WhatsApp banking adoption is a binary variable whereby participants were asked whether they will use WhatsApp for banking. Due to this reason, I felt that a logistic regression analysis would be appropriate. The null hypothesis is that there is no impact concerning the independent variables on the dependent variable. The results are noted below.

4.7.1 Descriptive statistics – logistic regression analysis

Table 17: Case processing summary

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	516	97.5
	Missing Cases	13	2.5
	Total	529	100.0
Unselected Cases		0	.0
Total		529	100.0

a. If weight is in effect, see classification table for the total number of cases.

Table 17 shows that 516 cases were included in my analysis. Moreover, those who said they would take up WhatsApp banking coded as 0 and those who said they would continue to use their mobile app were coded as 1. The case processing summary identifies missing values that the SPSS program could not use in the analysis (Table 16). There were 13 missing cases, which were excluded from the analysis.

4.7.2 Statistical hypothesis testing – logistic linear regression analysis with WhatsApp banking adoption as a dependent variable

Regression analysis

According to Worster et al. (2007), a regression analysis, also known is a common statistical procedure for demonstrating and quantifying the relationship between a scientific outcome and one or more other variables. In other words, a regression analysis enables you to predict an outcome based on knowledge of a predictor variable.

Linear regression

The most commonly used regression analysis is linear regression, which assumes a linear relationship between the dependent variable (also known as the response or outcome variable) and the independent variable (or variables) (i.e., the known or hypothesised predictor variable[s]). Linear regression creates a mathematical equation or model for the best fit line. This means that the variable of interest must be "continuous," meaning that it must not be a categorical variable, like a yes or no answer (Worster et al., 2007).

Logistic regression

Like multivariate linear regression, logistic regression builds a model to describe the impact of multiple predictors on a single response variable. However, the outcome variable in logistic regression must be categorical (usually dichotomous, i.e., with two possible outcomes, such as death or survival, although special techniques allow further categorised data to be modelled). To use logistic regression, a continuous outcome variable can be collapsed into a categorical one, but this reduces precision. If so, the categories should be clinically meaningful rather than arbitrary. Unlike linear regression, logistic regression does not require that predictor variables be linearly related, normally distributed, or have equal variance within groups. Because the relationship between the predictor and the outcome variable is not assumed to be linear, the measure of association between the two is expressed as an odds ratio (Worster et al., 2007).

Table 18: Classification table

Classification Table[a]

			Predicted		
			Behavioural intention on the uptake of WhatsApp Banking		
	Observed		I intend to utilise WhatsApp banking for my primary transactions in the future.	I am happy to continue using my current mobile banking mobile App instead.	Percentage Correct
Step 1	Behavioural intention on the uptake of WhatsApp Banking	I intend to utilise WhatsApp banking for my primary transactions in the future.	58	63	47.9
		I am happy to continue using my current mobile banking mobile App instead.	26	369	93.4
	Overall Percentage				82.8

a. The cut value is .500

The classification table (Table 18) demonstrates the splits concerning the dependent variable. This also shows that the percentage of cases that was correctly predicted within the model. The overall percentage is 82.8%.

Table 19: Hosmer and Lemeshow test

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	3.502	8	.899

The Hosmer and Lemeshow chi-squared goodness-of-fit test evaluates the overall fit of a logistic regression model (Table 19). It is significantly more powerful than the standard chi-square test when the predictive variables are constant or when the sample size is small (Hosmer and Lemeshow, 2000; Lai and Liu, 2018). The null hypothesis for this specific test is that the observed and unexpected proportions are the same across the dependent variable. This is the case since I obtained a statistically insignificant result (F (8) = 3.502, p = .899). I could therefore continue with the logistic regression analysis.

Table 20: Model summary

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	394.726[a]	.277	.417

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Cox and Snell R-Square and Nagelkerke R-Squared values represent two distinct methods of predicting the amount of variance explained by the model in the dependent variable and are interpreted similarly to R-Squared in multiple regression (Field, 2005; Hosmer and Lemeshow, 2000).

Table 20 contains the model summary regarding the logistic regression model. The independent variables can predict 41.7% of the variance in WhatsApp banking adoption. The Nagelkerke R-Squared value is used as it is the most used statistic concerning logistic regression analysis (Hosmer and Lemeshow, 2000), indicating a model with sufficient predictive power.

Table 21: Variables in the logistic regression equation

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Perceived_Trust	.290	.128	5.139	1	.023	1.336
	Banking_Inclusion	1.176	.290	16.449	1	.000	3.242
	Perceived_Usefulness	1.000	.237	17.755	1	.000	2.718
	Awareness	.019	.124	.022	1	.881	1.019
	Constant	-9.146	1.133	65.215	1	.000	.000

a. Variable(s) entered on step 1: Perceived_Trust, Banking_Inclusion, Perceived_Usefulness, Awareness.

Table 21 demonstrates the independent variables that were used in the model. Banking inclusion contained the highest odds ratio of all the variables and is statistically significant ($\chi 2(1) = 16.449$, $p<.001$). When banking inclusion increases, people are 3.242 times more likely to keep using their mobile app as opposed to using WhatsApp banking. This is the same trend for the other variables with lower odds ratios that were significant ($p<.05$). Awareness was the only variable that proved to be statistically insignificant within the model ($\chi 2(1) =.022$, $p =.881$).

There is sufficient evidence to suggest rejecting the null hypothesis and concluding that the independent variables significantly impact potential WhatsApp banking adoption. However, awareness does not significantly affect WhatsApp banking adoption.

4.8 Assessing whether awareness of mobile banking is perceived to be the same across all banking channels

For this section, I will evaluate if there is a significant difference in perceived awareness when assessing the various banking platforms. For this analysis, I opted to use a one-way ANOVA to compare means concerning awareness across the platforms. The null hypothesis is that awareness is perceived the same across all platforms. The results are noted below.

The one-way ANOVA allows one to test for the difference between the means for three or more groups (Quirk, 2012).

According to Ruxton and Beauchamp (2008), if there are more than two groups, most literature suggests performing an ANOVA to test the null hypothesis that all the groups are the same. If this null hypothesis is rejected, a post-hoc test is needed to figure out which groups are significantly different from each other (Chen et al., 2018).

4.8.1 Statistical hypothesis testing – descriptive statistics for stated dependent and independent variables regarding the one-way ANOVA

Table 22: Descriptive statistics – awareness by platform

Descriptive Statistics

Dependent Variable: Awareness

Which Platform do you currently use to conduct your banking the most?	Mean	Std. Deviation	N
Internet Banking	4.3671	.95422	79
Mobile App	3.9869	.96246	382
Cell phone Banking (USSD)	4.2133	1.05795	25
ATM	5.0000	.87039	23
Branch	4.8571	1.05158	7
Total	4.1130	.99271	516

ATMs showed the highest mean (M = 5.0000, SD = .87039), while cell phone banking (USSD) showed the lowest mean (M = 4.2133, SD = 1.05795) and had the highest standard deviation (Table 22).

Table 23: Independent samples t-test results

Tests of Between-Subjects Effects

Dependent Variable: Awareness

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	33.397[a]	4	8.349	8.999	.000	.066
Intercept	2081.264	1	2081.264	2243.160	.000	.814
Q10.1	33.397	4	8.349	8.999	.000	.066
Error	474.119	511	.928			
Total	9236.778	516				
Corrected Total	507.517	515				

a. R Squared = .066 (Adjusted R Squared = .058)

Table 23 presents the results from the one-way ANOVA. Q10 is noted as the banking platforms used most frequent to conduct transactions on. There is a significant difference between groups in terms of awareness (F (4,511) = 8,999, p<.01). This leads to rejecting the null hypothesis. Moreover, the effect size is

estimated to be 6.6%. The post-hoc test results in Table 24 show where the differences occur between groups.

Table 24: ANOVA post-hoc test results

Multiple Comparisons

Dependent Variable: Awareness
LSD

(I) Which Platform do you currently use to conduct your banking the most?	(J) Which Platform do you currently use to conduct your banking the most?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Internet Banking	Mobile App	.3802*	.11905	.001	.1463	.6141
	Cell phone Banking (USSD)	.1538	.22104	.487	-.2805	.5880
	ATM	-.6329*	.22822	.006	-1.0813	-.1845
	Branch	-.4901	.37986	.198	-1.2363	.2562
Mobile App	Internet Banking	-.3802*	.11905	.001	-.6141	-.1463
	Cell phone Banking (USSD)	-.2264	.19885	.255	-.6171	.1642
	ATM	-1.0131*	.20681	.000	-1.4194	-.6068
	Branch	-.8702*	.36739	.018	-1.5920	-.1485
Cell phone Banking (USSD)	Internet Banking	-.1538	.22104	.487	-.5880	.2805
	Mobile App	.2264	.19885	.255	-.1642	.6171
	ATM	-.7867*	.27830	.005	-1.3334	-.2399
	Branch	-.6438	.41190	.119	-1.4530	.1654
ATM	Internet Banking	.6329*	.22822	.006	.1845	1.0813
	Mobile App	1.0131*	.20681	.000	.6068	1.4194
	Cell phone Banking (USSD)	.7867*	.27830	.005	.2399	1.3334
	Branch	.1429	.41580	.731	-.6740	.9597
Branch	Internet Banking	.4901	.37986	.198	-.2562	1.2363
	Mobile App	.8702*	.36739	.018	.1485	1.5920
	Cell phone Banking (USSD)	.6438	.41190	.119	-.1654	1.4530
	ATM	-.1429	.41580	.731	-.9597	.6740

Based on observed means.
The error term is Mean Square(Error) = .928.
*. The mean difference is significant at the .05 level.

4.9 Chapter summary

This chapter addressed the research questions as identified in Chapter 1. The required reliability and validity statistics computed the necessary variables for further analysis, showing that my constructs were indeed statistically valid as well as statistically reliable.

The first research question analysed whether there was a difference in trust after adjusting for self-efficacy according to age group. Although there was no significant

difference, the estimated means did change somewhat due to the introduction of the covariate.

Thereafter, I analysed whether PU, trust, self-efficacy, banking inclusion and awareness influenced WhatsApp banking adoption. The model predicted that if all the independent variables had increased, the odds of respondents still using their mobile app would also increase more than the propensity to use WhatsApp banking. Moreover, awareness proved to be statistically insignificant.

For the last question, I wanted to assess if awareness is experienced differently across all the transactional banking platforms. This proved to be statistically significant. The most significant difference was between those that utilised ATMs and mobile apps for their main banking activities.

The next chapter presents a discussion of the findings and links the findings to the literature review.

5 CHAPTER 5: DISCUSSION OF RESEARCH RESULTS

5.1 Introduction

The primary goal of this study was to investigate the factors that may influence the behavioural intention to use WhatsApp banking in the context of financial inclusion through WhatsApp banking, as well as how the WhatsApp platform can assist the banking industry in providing more people with access to financial solutions. The TAM was used to model the respondents' behavioural intention to adopt the WhatsApp messaging platform for banking purposes. The research was conducted using a quantitative approach.

The specific objectives of the study were:

a) To ascertain the differences in perceived trust in WhatsApp banking based on age group, after considering perceived self-efficacy.

b) To investigate the different factors that influence behavioural intention for WhatsApp banking adoption.

c) To assess customer awareness of mobile banking across all banking channels.

Hypotheses were formulated based on the conceptual framework:

H_1 – Perceived trust of WhatsApp banking differs among age groups when considering perceived self-efficacy.
H_2 – Perceived risk and trust, banking inclusion, PU and awareness in the electronic banking system significantly effect WhatsApp banking adoption.
H_3 – Awareness of mobile banking platforms is experienced differently across the various channels.

5.2 Findings of research questions

5.2.1 Research question 1

RQ1: To ascertain the differences in perceived trust in WhatsApp banking based on age group after considering perceived self-efficacy.

When testing H_1, that perceived trust of WhatsApp banking is different amongst different age groups when considering perceived self-efficacy, the null hypothesis is that there is no difference in age groups according to trust in WhatsApp banking when it has been adjusted for self-efficacy.

Drawing insights from the literature: perceived trust and self-efficacy

According to the findings of the literature review in Chapter 2, organisations that provide clients with long-term data security assurance will experience the greatest growth and income. Customers can develop trust in these organisations, particularly banks because banks must protect their customers' personal information and investments. Apart from that, due to the high level of security concerns regarding customer data and investment protection and low switching costs, mobile banking adoption necessitates high levels of early user trust and self-efficacy.

Trust and consumer confidence in banking safety are still important factors in why people trust institutions with their money. Trust and its related concepts were one of the most important things that helped people decide where to bank. Based on the literature review, I conclude that trust is an important factor in adopting WhatsApp banking.

Self-efficacy refers to clients' trusting they have the necessary knowledge, skills, or capacity to utilise a new service. Customers must have trust in a specific technology to begin using it. When there is high consumer trust in new innovation, customers will begin using it, and their self-efficacy levels will rise. Customers need to have a high level of trust in their bank and themselves to adopt mobile banking. Therefore, it is the responsibility of financial institutions to build a trusting relationship with their

customers and make sure that they communicate the steps taken to address user concerns in mobile banking technology and make it seamless for their customers to start using a new platform or channel. There is a strong relationship between trust and self-efficacy according to the literature.

Results from research findings

When adjusted for self-efficacy, the null hypothesis states that there is no difference in age groups regarding trust in WhatsApp banking. To test this hypothesis, I first used the descriptive statistics one-way ANCOVA, which revealed that perceived trust for people aged 25-34 years had the highest mean and that perceived trust for people aged 45-54 years had the highest variance, implying that people in the 45-54 age group do not perceive trust at the same level as other age groups. After that, I used an ANOVA to compare the means of different age groups, with trust as the dependent variable. There was enough evidence to accept the null hypothesis that trust in WhatsApp banking is the same across all age groups ($F(5,504) = .381$, $p = .862$). The effect size for the age groups is small:$\eta^2=0.004$. This implies only a minor difference in trust perception among different age groups. I then adjusted the means for the covariate, and even after the adjustment, when adjusting for the covariate (self-efficacy), most of the group means increased. Additionally, all age groups scored trust in WhatsApp banking higher than those aged 55-64 years.

Summary of question 1

The literature on perceived trust and self-efficacy when using mobile banking suggests that trust is an important factor in adopting new technologies and innovation. When customers gain more trust in mobile banking, their self-efficacy increases. There is enough evidence to accept the null hypothesis that trust in WhatsApp banking is the same across all age groups. Financial institutions should build consumer trust across all age groups when it comes to the adoption of WhatsApp banking so that customers can become more comfortable with non-traditional banking platforms, in general, increasing financial inclusion.

5.2.2 Research question 2

RQ2: To investigate the different factors that influence behavioural intention for WhatsApp banking adoption**.**

Factors considered in answering this question were perceived trust, banking inclusion, PU and awareness

When testing H_2, that perceived risk and trust, banking inclusion, PU and awareness in the electronic banking system has a significant effect on WhatsApp banking adoption, the null hypothesis was that none of the independent variables (perceived trust, banking inclusion, PU, and awareness) affects the dependent variable (WhatsApp banking adoption). WhatsApp banking adoption was a binary variable whereby participants were asked whether they intended on using WhatsApp banking.

Drawing insights from the literature: perceived trust and risk

Real and perceived risks influence whether or not people use or accept WhatsApp banking. Cybercrime and data theft are rising as new technologies are discovered. When it comes to using digital channels to access financial services, customers are becoming more cautious. Identity theft, phishing, hacking, malware, data breaches and SIM swaps are all examples of mobile technology crimes. Because of the high level of security risk, strong customer trust is required.

Furthermore, research suggests that innovative technology may increase risks while also opening up new avenues for user acceptance. Banks must maintain and improve security measures to address threats such as cybercrime and money laundering. Collaborations with customers, on the other hand, have led to more innovative business models and services that have made customers happier, built trust, and made them more likely to use new technology.

Drawing insights from the literature: banking inclusion, perceived usefulness and awareness

Financial or banking inclusion ensures that all citizens have easy access to and use of the official financial system. As a result of digitalisation, new financial technologies have emerged that allow more people to access financial goods and services. Since the use of mobile devices outweighs the use of computers in South Africa, they are well-positioned to process payments. Nearly a third of South Africans (22 million) own smartphones.

For customers without a bank account, Nedbank and Vodacom introduced M-PESA. This was after Standard Bank launched "Instant Money," a joint venture with SPAR. FNB then introduced "e-Wallet," followed by ABSA's "Cash Send". With all these mobile banking solutions, all that is required to send and receive money is a valid cell phone number.

The literature highlights that South Africans are no strangers to using their mobile phones to conduct banking. From a PU point of view regarding mobile banking, customers believe that using certain technologies can improve the way they conduct their banking as long as they are aware of the benefits, safety features and trust that it will improve their lives.

In summary, there is a lot of research demonstrating that factors like perceived trust, banking inclusion, PU and awareness all play a role in people using new technologies like WhatsApp to do their banking.

Results from research findings

Various factors influence the adoption of new technologies, especially mobile banking that deals with customer's personal information and investments. The purpose of the research question was to determine the various factors that influence behavioural intention to adopt WhatsApp banking. My hypotheses were that perceived trust, banking inclusion, PU, and awareness of the e-banking system all have a significant effect on WhatsApp banking adoption, and the null hypothesis is

that none of the independent variables (perceived trust, banking inclusion, PU and awareness) affect the dependent variable (WhatsApp banking adoption).

In this question, I wanted to see how perceived trust, banking inclusion, usefulness and awareness affect WhatsApp banking adoption. WhatsApp banking adoption is a binary variable where respondents were asked if they planned to use WhatsApp banking in the future. For this reason, I used logistic regression analysis. Logistic regression builds a model to describe the impact of multiple predictors on a single response variable. The null hypothesis states that the independent variables have no impact on the dependent variable.

The model summary results for predicting the amount of variance in the dependent variable using the Nagelkerke R-Squared value revealed that the independent variables could predict 41.7% of the variance in WhatsApp banking adoption. The Nagelkerke R-Squared value was used because it is the most commonly used statistic in logistic regression analysis, and it represents a model with adequate predictive power.

The independent variables used in the logistic regression were perceived trust, banking inclusion, PU and awareness. Banking inclusion had the highest odds ratio of any variable, and it was statistically significant ($\chi 2(1) = 16.449$, $p<.001$). This indicates that when banking inclusion increases, people are 3.242 times more likely to keep using their mobile app instead of WhatsApp banking. In other words, as more people are formally banked, they would use their bank’s mobile banking app, and as existing customers learn more about the benefits of mobile banking, they would likely use their banks' existing mobile applications as opposed to a new mobile technology like WhatsApp banking. This is consistent with the trend for the other variables with lower odds ratios that were significant ($p<.05$). Awareness was the only variable that proved to be statistically insignificant within the model ($\chi 2(1) = .022$, $p = .881$).

There is sufficient evidence to suggest that the null hypothesis should be rejected and that the independent variables do have a statistically significant impact on the

likelihood of WhatsApp banking adoption. However, the results indicated that raising awareness does not significantly impact the adoption of WhatsApp banking.

Summary of question 2

The literature on the various factors influencing behavioural intention to adopt WhatsApp banking demonstrates that factors such as perceived trust, banking inclusion, PU and awareness of the electronic banking system all play a significant role in the uptake of mobile banking solutions such as mobile banking and would have the same effect on WhatsApp banking. There is sufficient evidence to reject the null hypothesis and that the independent variables do indeed have a statistically significant effect on the likelihood of WhatsApp banking adoption. Awareness has little effect on the adoption of WhatsApp banking. This could be because banks are already raising enough awareness about mobile banking. The study, however, was conducted with the majority of respondents residing in Johannesburg. Awareness may be critical when it comes to WhatsApp banking adoption in rural areas where customers still rely on traditional banking services. Financial institutions should raise awareness of mobile banking in rural areas to help customers become more comfortable with non-traditional banking platforms thereby increasing financial inclusion.

5.2.3 Research question 3

RQ3: Assessing whether awareness of mobile banking is perceived to be the same across all banking channels.

When testing H_3, that awareness of mobile banking platforms is experienced differently across the various channels, the null hypothesis is that awareness is perceived to be the same across all channels.

To answer this question, I evaluated if there is a significant difference in terms of perceived awareness when assessing the various banking platforms. These banking platforms include Internet banking, mobile banking apps, cell phone banking (USSD), ATMs and traditional brick and mortar branches.

Drawing insights from the literature

Mobile banking awareness is knowledge of the system's presence and advantages. It is the level of knowledge that customers have regarding mobile banking. Consumers appear to prefer avoiding ambiguity over maximising the value and advantages of services when it comes to mobile banking adoption or usage. Perceived risk linked with technology services may impact behavioural intention to use the technology if there isn't sufficient awareness about the safety features to safeguard customers. Raising awareness regarding the usage and advantages of technology will reduce perceived risk.

PU and information about online banking are key elements affecting bank customers' acceptance of new banking technology like Internet and mobile banking. This means that how banks promote mobile banking and create awareness is very important to how many people use it.

Perceived awareness impacts variables like perceived trust, self-efficacy, perceived risk and PU. If sufficient awareness is created, customers will gain more trust, self-efficacy will improve, and the perceived risks will not severely impact the adoption of the technology. If one looks at mobile banking today, customers are aware of the risks involved with banking digitally. However, banks are creating a lot of awareness about the risks of online banking for their customers about the do's and don'ts of online banking, and customers are still using mobile banking, but with more caution because banks are not only creating awareness about the benefits of mobile banking, but the associated risks too, and this protects customers.

Banks should make it easier to use mobile banking apps. To increase the level of adoption, they should conduct training programmes for their customers. Regular surveys of their customers' satisfaction with the mobile banking application should be conducted, and if customers request any changes these should be incorporated regularly.

Results from research findings

The test was to assess whether awareness of mobile banking is perceived to be the same across all banking channels. In other words, do customers have the same level of awareness of all banking platforms? The results of the one-way ANOVA highlighted that there is a significant difference between groups in terms of awareness (F (4,511) = 8,999, p= .01), indicating that customers are not aware of all the banking platforms available and their perceived benefits. Alternatively, it could also mean that there are too many options available for banking and customers are utilising only the platforms that they have been using traditionally or the platforms that they deem as useful.

This leads me to reject the null hypothesis that awareness is perceived to be the same across all channels. I used a post-hoc test to determine the differences in awareness by dependent variable. The differences are noted below.

The results from the ANOVA post-hoc test highlighted the following:

People that frequently use Internet banking are not aware of the benefits of using their bank's mobile apps and ATMs for their banking. Individuals who use their banks' mobile apps more frequently are not aware of the benefits of Internet banking, ATMs and in-branch banking. This could be that customers using their bank's mobile app find it useful and do not need to use an alternative channel to do their banking unless there is no other way; for example, when there are technical issues with their mobile banking app or they don’t have access to their mobile phones. People that use their cell phones for banking via USSD are not aware of the benefits of using an ATM, or there is no need for them to make use of one. People that transact mainly on ATMs are not aware of the benefits of transacting via Internet banking, mobile banking apps and cell phone banking. This could be due to the type of transaction performed (mainly cash deposits or withdrawals) or lack of knowledge of alternative banking channels. Finally, people who go to a traditional branch don't know about the benefits of using their bank's mobile applications for banking.

From the ANOVA post-hoc test empirical results, one can conclude that banks have too many products currently and customers are not interested in all of these products. They use what they need and feel comfortable with. Banks should look at consolidating their offerings to save costs and reduce customer confusion.

Thus, the null hypothesis that awareness is perceived as the same across all channels was rejected.

Summary of question 3

The majority of independent variables had a significant effect on potential WhatsApp banking adoption; awareness had no significant effect, necessitating further analysis to determine whether awareness of mobile banking as a dependent variable is perceived to be consistent across all bank platforms. The findings indicated that awareness of mobile banking platforms varies across channels. Depending on which channel a customer is familiar with or has been using for an extended period, they will remain loyal to that platform. If people don't know about other products and services, they will keep using the banking channels they are used to, even if there are better options.

In conclusion, awareness is experienced differently across all the transactional banking platforms, as the results from the test proved to be statistically significant. The most significant difference was between those that utilised ATMs and mobile applications for their main banking activities.

5.3 Managerial implications

From a theoretical perspective, this research examined the effect of trust, self-efficacy, risk, banking inclusion, usefulness and awareness on WhatsApp banking adoption. The findings indicated that all these variables impact the adoption of WhatsApp banking. Managers need to create awareness around the benefits of WhatsApp banking and the risk mitigation plans that are in place to safeguard customers. This should be done with both staff and customers. Regular training

should be conducted with staff and extensive marketing should be considered to create customer awareness.

If the mobile banking sphere is to grow and expand, managers need to ensure that customer experience is prioritised in business models. A variety of actions can be taken in this regard. Managers in the banking industry must continue to use technology to reduce costs and, as a result, provide low-cost products and services. Customers' expectations of low prices must be met. A price personalisation system can boost a company's revenue. In terms of customer service, banks should offer multiple communication channels and be proactive in resolving issues. They must ensure that they communicate service improvements that will benefit customers regularly and proactively.

To avoid a rise in consumer risk perception, managers must continue to invest in security that safeguards financial data and operations. Customers benefit from the speed with which mobile banking services are delivered. Banks are expected to provide high-quality financial services in a timely and efficient manner. Increasing the speed with which services are delivered should not jeopardise security. WhatsApp banking can help customers save time by improving service speed. Customers' needs for functionality and usefulness must be prioritised over innovation. Customers can benefit from innovation if it results in quick, secure and low-cost financial services.

Regardless of critical technical assistance, innovation must consider people's needs and provide benefits to them. Customer loyalty intentions are heavily influenced by the customer experience. In the banking industry, one of the determinants of customer loyalty is customer experience. As banks develop innovative financial services, this is becoming increasingly important. Managers must test new service delivery configurations and measure customer satisfaction continuously. It is critical to employ both dynamic and traditional questionnaires. Dynamic measurements should be used to record how customers feel at the point of consumption.

5.4 Chapter summary

The literature on perceived trust and self-efficacy when using mobile banking suggests that trust is an important factor in adopting new technologies and innovation. Financial institutions should build consumer trust across all age groups so that customers can become more comfortable with non-traditional banking platforms in general. Trust should be created around plans and processes to safeguard customer information and investments. This will increase financial inclusion as good customer relations, customer interactions and sufficient awareness around risk mitigation plans instil trust in customers, therefore, increasing customer loyalty.

My inferences from the empirical data findings indicate that there is sufficient evidence to reject the null hypothesis and that the independent variables do indeed have a statistically significant effect on the likelihood of WhatsApp banking adoption. The adoption of WhatsApp banking may be affected by a lack of awareness in rural areas where customers still rely on traditional banking channels. Financial institutions should raise awareness of mobile banking across all channels to help customers become more comfortable with non-traditional banking platforms, thereby increasing financial inclusion. Awareness is experienced differently across all the transactional banking platforms. The independent variables were perceived trust, banking inclusion, PU and awareness.

6 CHAPTER 6: CONCLUSION

6.1 Introduction

The study's conclusion is presented in this chapter. The chapter will focus on five main topics. The first section of the chapter gives an overview of the findings from the literature review. The findings of the empirical data will then be summarised. Following that, the study points out gaps in the body of knowledge and suggests areas where more research should be done, followed by a proposed action plan to increase WhatsApp banking adoption. Finally, the chapter offers a set of recommendations based on the study's empirical findings on how businesses can best implement ways to increase WhatsApp banking adoption.

6.2 Summary of literature findings

The literature review backs up all the hypotheses from the research questions. This is very important for financial institutions because there are many things to think about when trying to get people to use mobile banking, or in the case of my research, WhatsApp banking in particular. There is no single solution or answer for increasing financial inclusion, and banks should invest time in understanding their customers' needs and designing their platforms accordingly. Trust is essential, and banks need to build relationships with their customers and make people aware of the benefits of mobile banking and how they protect their customers when they use mobile platforms for banking.

Banks must maintain and improve security to combat cybercrime and money laundering. WhatsApp banking may increase risks but also create new opportunities. According to Moussavou (2020), new mobile banking technology can help banks increase profits and reduce costs. This approach may improve risk management, customer satisfaction and service efficiency (Mirchandani et al., 2020; Wang et al., 2021).

The TAM is a popular model in African mobile money research. The TAM is considered the most reliable method for assessing technology adoption. However,

it excludes collective, social and cultural dimensions of technology adoption as well as individual user attitudes (Adams et al., 2007; Venkatesh et al., 2003; Wentzel et al., 2013). Factors that enable consumer adoption include ease of use, self-efficacy, and trust, as well as cost and risk awareness (Davis, 1985).

6.3 Summary of empirical data findings

As highlighted in the empirical data findings, the independent variables that were used in the logistic regression model indicated that banking inclusion contained the highest odds ratio of all the variables and is statistically significant ($\chi 2(1) = 16.449$, $p<.001$). This is interpreted as when banking inclusion increases, people are 3.242 times more likely to keep using their mobile app instead of using WhatsApp banking. The trend is the same for the other variables with lower odds ratios. By looking at only this analysis, one can say that even though WhatsApp banking is considered to be a possible solution for financial inclusion, customers are already comfortable using their bank's existing mobile app to conduct transactions. Chances are that new customers from the underbanked or unbanked market will continue with this trend because banks have already invested a lot in their banking apps, and they create awareness around this platform regularly.

This means that the banks would have to put a lot of money into making an online banking platform that is similar to or even better than their current one, and they would also have to spend a lot of money marketing the new platform.

The conceptual research model (TAM) was used to determine what factors affect people's intentions to use new technology like WhatsApp for banking. All the independent variables influence the dependent variables, implying that people will be less likely to adopt WhatsApp for banking. This is because they already find it useful to use their existing banking application, they have built up sufficient self-efficacy, there is a level of trust in the existing platform, and the perceived risks are mitigated via several security features.

6.4 Areas for further research

This study used a quantitative methodology to investigate the factors that may influence behavioural intention to use WhatsApp banking in the context of financial inclusion. The findings shed some light on broad issues such as trust in the electronic banking system, awareness, PU and PEOU of new technologies. The majority of these factors influence the intention to use WhatsApp for banking purposes, and future research could use a qualitative methodology to determine the specific reasons why respondents hold this opinion. A qualitative methodology based on open-ended questions could provide more insight into the specific reasons why people felt these factors influenced their intention to start using WhatsApp for banking.

Further research may also look into how other social media platforms might be used to help people get access to financial services. There are several alternatives to WhatsApp in the social media space, like Telegram, Facebook, Twitter and Instagram. Customers may believe that these alternatives to WhatsApp are more secure, which could lead them to adopt these alternatives instead.

In my modified conceptual framework, I only looked at certain constructs of the TAM. Future studies can look at all other variables of the model to identify other factors that may impact the adoption of WhatsApp banking.

There are multiple other theoretical frameworks to test the adoption of new technology. These include the Unified Theory of Acceptance and Use of Technology and the Theory of Planned Behavior. Future studies can include these models.

6.5 Proposed action plan and recommendations

6.5.1 Action plan before launching to customers

Table 25 outline five steps to action before launching WhatsApp banking to customers.

Table 25: Five steps to action before launching WhatsApp banking to customers

Step	Proposed action
Step 1	Conduct a customer survey around WhatsApp banking innovation to test what customers' thoughts and opinions are. Allow for open-ended questions so that customers can provide specific recommendations and feedback.
Step 2	Analyse the data and do more research on areas that require additional investigation.
Step 2	Once all the relevant data is gathered, discuss the findings with relevant stakeholders for further comments and suggestions.
Step 3	Understand the budget requirements and craft an implementation and operational plan with all stakeholders.
Step 4	Because this is a new mobile banking solution, it is recommended that a Proof of Concept is employed with a small group for testing to gain additional learnings.
Step 5	Once the Proof of Concept has been completed, an application can be submitted for approval to launch to a broader customer base.

6.5.2 Action Plan when launching to customers

Table 26 outlines six steps to action when launching WhatsApp banking to customers.

Table 26: Six steps to action when launching WhatsApp banking to customers

Step	Proposed action
Step 1	Ensure all the operational processes and risk mitigation plans are in place. Ensure that a support team is in place to assist with customer queries.
Step 2	Ensure that sufficient awareness is created around the new technology and the product's usefulness. Make customers aware of the risk mitigation plans to safeguard their information and investments. Market the reasons for the new innovation and how the organisation is implementing new ideas to increase cheaper financial solutions that are easy to use.
Step 3	Advise customers of the costs involved and how WhatsApp banking could save money and time.
Step 4	Request regular customer feedback and incorporate those changes into the new innovation if there is sufficient evidence to support them.
Step 5	Offer assistance to customers to increase self-efficacy.
Step 6	Measure the impact of the new technology by conducting regular customer surveys.

6.6 Chapter summary

The literature on the proposed adoption of WhatsApp banking places high emphasis on how unbanked and underbanked South Africans can benefit from new banking solutions. Factors like ease of use, self-efficacy and trust, as well as cost and risk awareness, all impact a user's acceptance of new technologies. The empirical data findings highlight what the TAM predicts about the impact of ease of use, self-efficacy and trust, as well as cost and risk awareness on the acceptance of new technology.

The findings indicated that people are 3.242 times more likely to keep using their mobile app instead of WhatsApp banking. Customers are already comfortable using their bank's existing mobile applications to conduct transactions. Banks have

already invested a lot in their existing banking apps, and they regularly create awareness around these platforms.

A quantitative approach was taken to examine factors that may influence behavioural intention to use WhatsApp banking in the context of financial inclusion. The findings shed light on broad issues like trust in electronic banking, awareness, PU and ease of use. Other social media platforms may also help people access financial services in future studies.

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Annexure A: Reliability - Cronbach's Alpha results

Table A1: Reliability statistics: perceived usefulness

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.890	.892	4

Table A2: Perceived usefulness scale item statistics

Item Statistics

	Mean	Std. Deviation	N
WhatsApp Banking will be a very useful tool for me to conduct my banking.	4.58	1.267	518
WhatsApp banking will make banking much easier than going to a branch.	3.99	1.146	518
WhatsApp banking will be more useful than internet banking.	4.92	1.305	518
WhatsApp banking will help me accomplish everyday banking.	4.40	1.175	518

Table A3: Reliability statistics – self-efficacy

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.719	.713	3

Table A4: Item statistics – perceived self-efficacy

Item Statistics

	Mean	Std. Deviation	N
I feel that I will be comfortable using WhatsApp for banking purposes.	4.91	1.417	517
I feel that WhatsApp banking can make my life easier.	4.46	1.196	517
I feel that I have the ability to use WhatsApp seamlessly.	3.61	.912	517

Table A5: Reliability statistics – trust scale

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.869	.866	4

Table A6: Item statistics – perceived trust scale

Inter-Item Correlation Matrix

	I trust WhatsApp with my personal data.	I trust the security features on WhatsApp.	I believe my information is safely stored on WhatsApp.	I believe that my bank will keep my information safe.
I trust WhatsApp with my personal data.	1.000	.783	.772	.401
I trust the security features on WhatsApp.	.783	1.000	.850	.452
I believe my information is safely stored on WhatsApp.	.772	.850	1.000	.443
I believe that my bank will keep my information safe.	.401	.452	.443	1.000

Table A7: Reliability statistics – banking inclusion

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.818	.815	5

Table A1: Item statistics – banking inclusion

Item Statistics

	Mean	Std. Deviation	N
I think WhatsApp banking could help more people bank more conveniently.	4.07	1.054	516
I believe WhatsApp Banking would help me achieve my goals.	4.91	1.171	516
I feel that frictionless banking is essential for the community as a whole.	3.82	.941	516
I will save time and money by using WhatsApp for banking.	4.30	1.157	516
I believe WhatsApp banking will increase financial inclusion.	4.26	1.073	516

Table A2: Reliability statistics – awareness

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.863	.864	3

Table A3: Item statistics – awareness

Item Statistics

	Mean	Std. Deviation	N
I receive enough information about mobile banking services.	4.09	1.089	516
I receive enough information about the benefits of mobile banking.	4.12	1.113	516
I receive information about mobile banking services from my bank regularly.	4.13	1.160	516

Annexure B: Validity- Cronbach's Alpha results:

Table B4: Perceived usefulness correlations

Correlations

		WhatsApp Banking will be a very useful tool for me to conduct my banking.	WhatsApp banking will make banking much easier than going to a branch.	WhatsApp banking will be more useful than internet banking.	WhatsApp banking will help me accomplish everyday banking.
WhatsApp Banking will be a very useful tool for me to conduct my banking.	Pearson Correlation	1	.701**	.644**	.704**
	Sig. (2-tailed)		.000	.000	.000
	N	518	518	518	518
WhatsApp banking will make banking much easier than going to a branch.	Pearson Correlation	.701**	1	.596**	.708**
	Sig. (2-tailed)	.000		.000	.000
	N	518	518	518	518
WhatsApp banking will be more useful than internet banking.	Pearson Correlation	.644**	.596**	1	.691**
	Sig. (2-tailed)	.000	.000		.000
	N	518	518	518	518
WhatsApp banking will help me accomplish everyday banking.	Pearson Correlation	.704**	.708**	.691**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	518	518	518	518

**. Correlation is significant at the 0.01 level (2-tailed).

Table B5: Perceived self-efficacy correlations

Correlations

		I feel that I will be comfortable using WhatsApp for banking purposes.	I feel that WhatsApp banking can make my life easier.	I feel that I have the ability to use WhatsApp seamlessly.
I feel that I will be comfortable using WhatsApp for banking purposes.	Pearson Correlation	1	.700**	.283**
	Sig. (2-tailed)		.000	.000
	N	517	517	517
I feel that WhatsApp banking can make my life easier.	Pearson Correlation	.700**	1	.376**
	Sig. (2-tailed)	.000		.000
	N	517	517	517
I feel that I have the ability to use WhatsApp seamlessly.	Pearson Correlation	.283**	.376**	1
	Sig. (2-tailed)	.000	.000	
	N	517	517	517

**. Correlation is significant at the 0.01 level (2-tailed).

Table B6: Perceived trust correlations

Correlations

		I trust WhatsApp with my personal data.	I trust the security features on WhatsApp.	I believe my information is safely stored on WhatsApp.	I believe that my bank will keep my information safe.
I trust WhatsApp with my personal data.	Pearson Correlation	1	.783**	.772**	.401**
	Sig. (2-tailed)		.000	.000	.000
	N	516	516	516	516
I trust the security features on WhatsApp.	Pearson Correlation	.783**	1	.850**	.452**
	Sig. (2-tailed)	.000		.000	.000
	N	516	516	516	516
I believe my information is safely stored on WhatsApp.	Pearson Correlation	.772**	.850**	1	.443**
	Sig. (2-tailed)	.000	.000		.000
	N	516	516	516	516
I believe that my bank will keep my information safe.	Pearson Correlation	.401**	.452**	.443**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	516	516	516	516

**. Correlation is significant at the 0.01 level (2-tailed).

Table B7: Banking inclusion correlations

Correlations

		I think WhatsApp banking could help more people bank more conveniently.	I believe WhatsApp Banking would help me achieve my goals.	I feel that frictionless banking is essential for the community as a whole.	I will save time and money by using WhatsApp for banking.	I believe WhatsApp banking will increase financial inclusion.
I think WhatsApp banking could help more people bank more conveniently.	Pearson Correlation	1	.568**	.405**	.608**	.542**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	516	516	516	516	516
I believe WhatsApp Banking would help me achieve my goals.	Pearson Correlation	.568**	1	.341**	.639**	.439**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	516	516	516	516	516
I feel that frictionless banking is essential for the community as a whole.	Pearson Correlation	.405**	.341**	1	.328**	.307**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	516	516	516	516	516
I will save time and money by using WhatsApp for banking.	Pearson Correlation	.608**	.639**	.328**	1	.508**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	516	516	516	516	516
I believe WhatsApp banking will increase financial inclusion.	Pearson Correlation	.542**	.439**	.307**	.508**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	516	516	516	516	516

**. Correlation is significant at the 0.01 level (2-tailed).

Table B8: Awareness correlations

Correlations

		I receive enough information about mobile banking services.	I receive enough information about the benefits of mobile banking.	I receive information about mobile banking services from my bank regularly.
I receive enough information about mobile banking services.	Pearson Correlation	1	.762**	.619**
	Sig. (2-tailed)		.000	.000
	N	516	516	516
I receive enough information about the benefits of mobile banking.	Pearson Correlation	.762**	1	.655**
	Sig. (2-tailed)	.000		.000
	N	516	516	516
I receive information about mobile banking services from my bank regularly.	Pearson Correlation	.619**	.655**	1
	Sig. (2-tailed)	.000	.000	
	N	516	516	516

**. Correlation is significant at the 0.01 level (2-tailed).

Annexure C: ANCOVA analysis diagrams

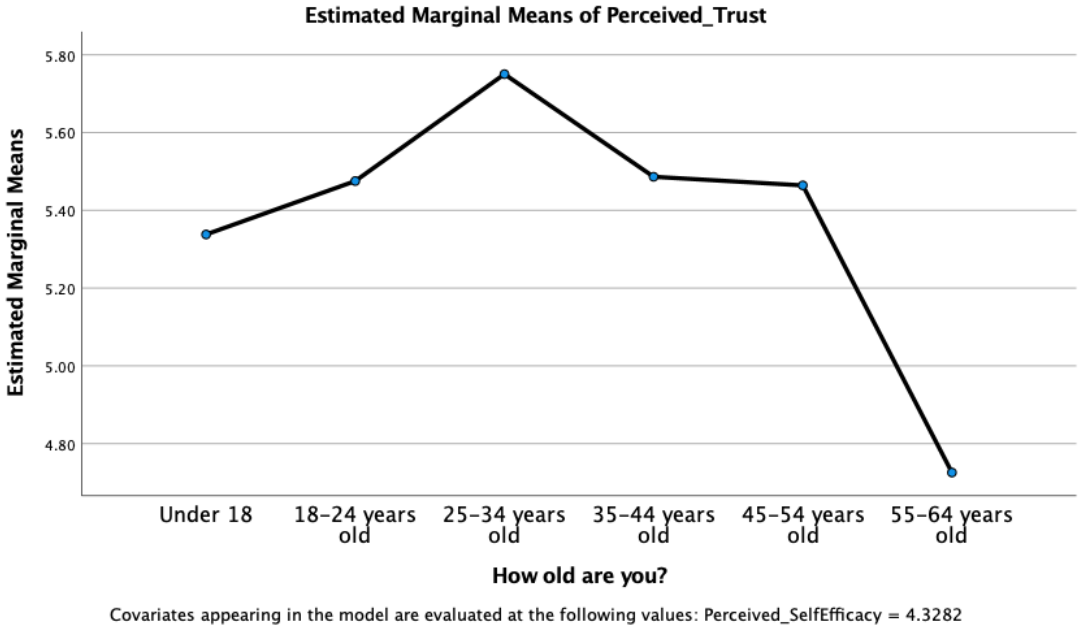


Figure C1: Estimated marginal means of trust

Table C9: Gender counts

How do you describe yourself?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	191	36.1	36.8	36.8
	Female	320	60.5	61.7	98.5
	Prefer not to say	8	1.5	1.5	100.0
	Total	519	98.1	100.0	
Missing	System	10	1.9		
Total		529	100.0		

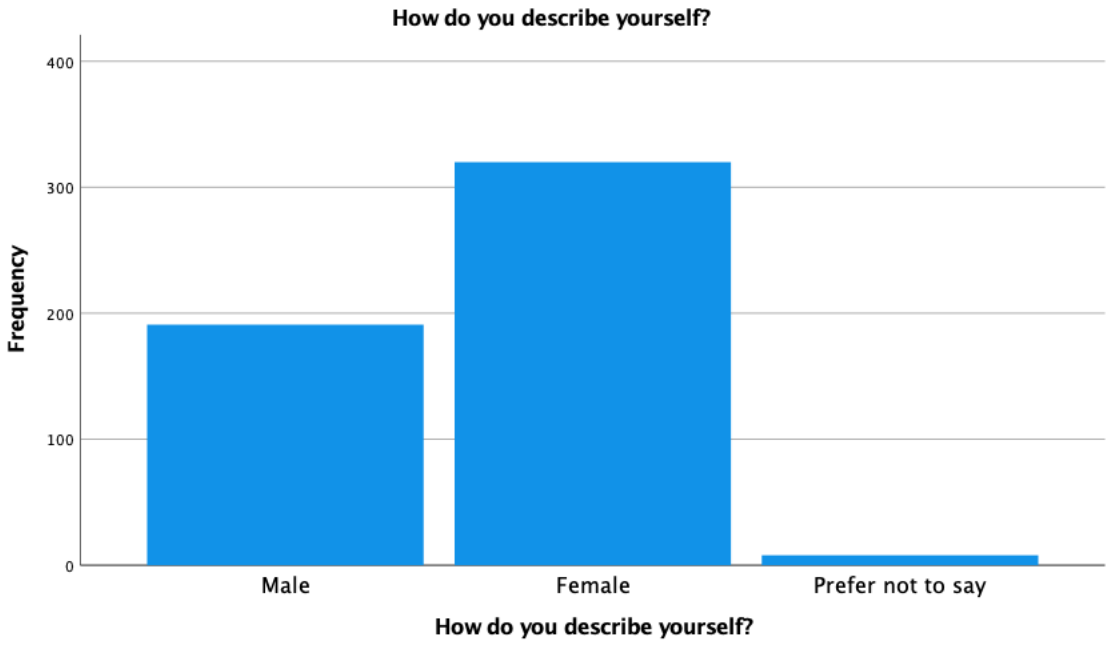


Figure C2: Gender bar graph

Table C2: Age frequencies

Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 18	29	5.5	5.6	5.6
	18-24 years old	330	62.4	63.6	69.2
	25-34 years old	79	14.9	15.2	84.4
	35-44 years old	50	9.5	9.6	94.0
	45-54 years old	27	5.1	5.2	99.2
	55-64 years old	4	.8	.8	100.0
	Total	519	98.1	100.0	
Missing	System	10	1.9		
Total		529	100.0		

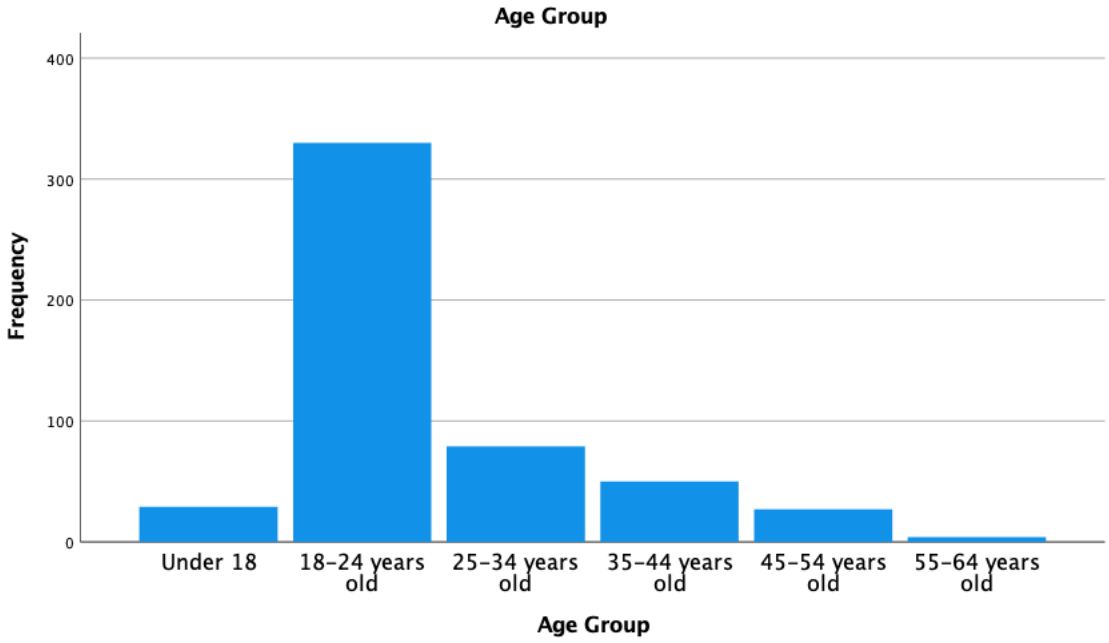


Figure C3: Age frequency graph

Table C3: Employment status

What best describes your employment status over the last three months?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Working full-time	146	27.6	28.1	28.1
	Working part-time	25	4.7	4.8	32.9
	Unemployed	39	7.4	7.5	40.5
	Student	309	58.4	59.5	100.0
	Total	519	98.1	100.0	
Missing	System	10	1.9		
Total		529	100.0		

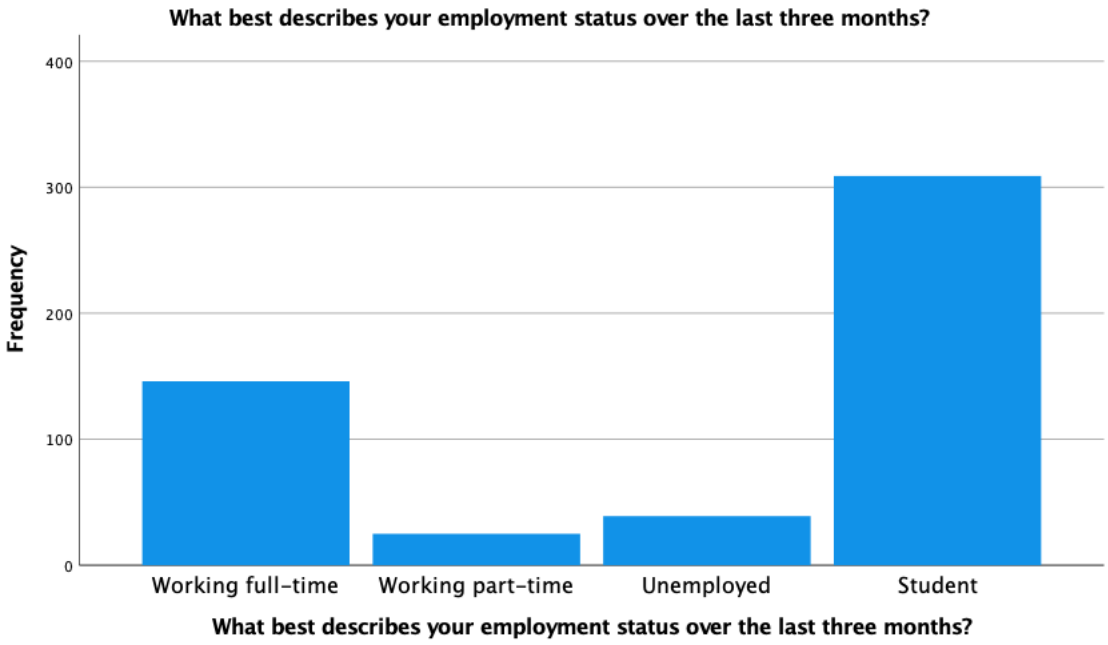


Figure C4: Employment status bar graph

Annexure D: Survey instrument

Table D1: Survey instrument

Block	Category	Questions
1	Informed Consent	**Q1.1** I consent, begin the study. **Q1.2** I do not consent, I do not wish to participate.
2	Demographics	**Q2.1** How old are you? **Q2.2** How do you describe yourself? **Q2.3** What best describes your employment status over the last three months?
3	Perceived usefulness	**Q3.1** WhatsApp banking will be a very useful tool for me to conduct my banking. **Q3.2** WhatsApp banking will make banking much easier than going to a branch. **Q3.3** WhatsApp banking will be more useful than Internet banking. **Q3.4** WhatsApp banking will help me accomplish everyday banking.
4	Perceived ease of use	**Q4.1** I believe it will be easy for me to adjust to banking via WhatsApp. **Q4.2** I will need to consult a user guide for WhatsApp banking. **Q4.3** I believe that using WhatsApp for banking purposes will be awkward. **Q4.4** I believe that working with mobile applications is often a cause of frustration.
5	Perceived self-efficacy	**Q5.1** I feel that I will be comfortable using WhatsApp for banking purposes. **Q5.2** I feel that WhatsApp banking can make my life easier. **Q5.3** I feel that I have the ability to use WhatsApp seamlessly. **Q5.4** I do not require assistance when using WhatsApp.
6	Perceived risk and trust in the e-banking system	**Q6.1** I trust WhatsApp with my personal data. **Q6.2** I trust the security features on WhatsApp. **Q6.3** I believe my information is safely stored on WhatsApp. **Q6.4** I believe that my bank will keep my information safe.
7	Financial banking inclusion	**Q7.1** I think WhatsApp banking could help more people bank more conveniently. **Q7.2** I believe WhatsApp banking would help me achieve my goals. **Q7.3** I feel that frictionless banking is essential for the community as a whole. **Q7.4** I will save time and money by using WhatsApp for banking. **Q7.5** I believe WhatsApp banking will increase financial inclusion.
8	Awareness of mobile banking	**Q8.1** I receive enough information about mobile banking services. **Q8.2** I receive enough information about the benefits of mobile banking. **Q8.3** I receive information about mobile banking services from my bank regularly.
9	Perceived comparative advantage	**Q9.1** What consideration do you think is the most important when choosing a bank or banking services?
10	Banking platforms	**Q10.1** Which Platform do you currently use to conduct your banking the most?
11	Preferred bank	**Q11.1** Which Bank do you currently use to conduct your main transactions?
12	Behavioural intention	**Q12.1** I intend to utilise WhatsApp banking for my primary transactions in the future. **Q12.2** I am happy to continue using my current mobile banking mobile App instead. **Q12.3** I will start using my bank's mobile banking App instead.