



UNIVERSITY OF THE WITWATERSRAND
SCHOOL OF BUSINESS SCIENCES

Master of Commerce in the field of Business Sciences (Marketing)

Mobile banking apps curation: Assessing the factors that influence mobile banking's continuous use amongst Millennials and Generation Z

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ABSTRACT

The proliferation of mobile banking platforms and the widespread use of intelligent devices like smartphones and tablets have caused a paradigm change in the banking industry in recent times. Millennials and Generation Z (Gen Z), dubbed the "digital natives," make up most of these service consumers. Millennials and Gen Z are increasingly using mobile banking apps, which has transformed how financial services are delivered. Nevertheless, despite being widely adopted, banks need help to ensure the continuous use of these apps to sustain a devoted and loyal consumer base while competing in the market. This study, therefore, investigates the factors influencing Millennials and Gen Z's continuous use of mobile banking applications. Five theoretical frameworks have been adopted to direct the research inquiry: Computers As A Social Actor (CASA), Expectation Confirmation Theory (ECT-IS), Social Response Theory (SRT), Task Technology Fit (TTF), and the Unified Theory of Acceptance and Use of Technology (UTAUT). The study adopted these frameworks based on their theoretical and empirical applicability and ability to provide perspectives into the variables impacting Millennials and Gen Z's continuous use of mobile banking apps. The study employed SPSS (Statistical Package for the Social Sciences) for the analysis of descriptive statistics. To validate the theoretical model and investigate the interactions between variables, Partial Least Squares Structural Equation Modelling (PLS-SEM). PLS-SEM, Smart PLS software was used to assess the validity and reliability of the constructs as well as the strength and importance of the proposed paths in the structural model was made possible by the PLS-SEM methodology. This provided an overview of the dataset and made it possible to do a thorough analysis by outlining important features like means, frequencies, and standard deviations. The research used quota sampling for a sample size of 505 participants. The study's conclusions indicate that there is a substantial correlation among perceived anthropomorphism, expectation confirmation, service quality of mobile applications, mobile banking app satisfaction, technology fit, and consistent usage of mobile banking apps. The study's goal is to advance our understanding of the field of banking and financial services marketing. The banking sector can apply the findings and insights to differentiate its offerings from its competitors and gain a competitive edge while potentially boosting profitability.

Keywords: Anthropomorphism, Artificial Intelligence, Retail Banking, Gamification, Gen Z, Millennials, Mobile banking app continuous use

ACKNOWLEDGEMENTS

I dedicate this work primarily to God. “I can do all things through Christ, which strengthens me” - (Philippians 4:13). Without Him, I would not have the strength to continue life's arduous journey. “In Him, I live and move and have my being” (Acts 17:28).

To my parents, Maria and the late Buti Mashishi, I am dedicating this dissertation effort to you. Mama, you have been my bedrock and influential in formulating my beliefs on the value of intellectual curiosity. I am blessed that you support my ambitions and goals. You continue to reaffirm my ability to conquer the world. Papa, while you are no longer physically present, I still feel your angelic support. I appreciate your love and support, and knowing I am loved comforts me.

Throughout this process, Dr. Melissa Zulu, my supervisor, you been an amazing source of support. You have my deepest gratitude for your persistence, encouragement, and cooperation in making this research project a success. Thank you to the Wits writing division for your contribution to the success of this study. Your advice and mentoring guaranteed that I delivered this research professionally. To my coworkers and friends, I'd like to convey my appreciation for your support during this journey, particularly for your ongoing encouragement to keep going. Most of all, your prayers humble me. All of the respondents who volunteered to participate in this study have my sincere gratitude. Because of you, this research was made possible. In closing, I express my gratitude to Investec for helping to realise my dream by funding my education.

DECLARATION

I, Neo Mashishi, declare that this dissertation, titled Mobile Banking Apps Curation: Assessing the Factors that Influence Mobile Banking's continuous use amongst Millennials and Generation Z, is my work. It is presented for consideration for the Master of Commerce (Research) in the field of Marketing at the University of the Witwatersrand School of Business Sciences in Johannesburg, South Africa. It has never been submitted to this university or any other for a degree or assessment.

A handwritten signature in black ink on a light beige background. The signature is stylized and appears to read 'Mashishi'.

Neo Mashishi

Signed on the 5th day of April 2024 in Johannesburg.

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LIST OF ABBREVIATIONS AND ACRONYMS

AI	Artificial Intelligence
AIET	AI-enabled technology
AMOS	Analysis Moment of Structures
APPS	Applications
ATM	Automatic Teller Machine
AVS	Address Verification Service
CASA	Computers as Social Actors
CECL	Current Expected Credit Loss
C-TAM-TPB	Technology Acceptance Model and the Theory of Planned Behaviour
E2EE	End-to-End Encryption
ECT-IS	Expectation Confirmation Theory of Information System Continuance
FC	Facilitating Conditions
FINTECH	Financial Technology
Gen Z	Generation Z
GM	Gamification
HMC	Human-machine communication
IDT	Innovation Diffusion Theory
IT	Information Technology
MM	Motivation Model
MPCU	Model of PC Utilisation
NFT	Non-Fungible Token
OOBA	Out-of-band Authentication
RBA	Risk-based authentication
RPP	Rapid Payments Program
SCT	Social Cognitive Theory
SI	Social Influence
TAM	Technology Acceptance Model
TPB	The Theory of Planned Behaviour
TRA	Theory of Reasoned Action
TTF	Task Technology Fit
UTAUT	Unified Theory of Acceptance and Use of Technology

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

In the dynamic realm of contemporary banking, the surge in mobile banking adoption has reshaped the dynamics of interaction between consumers and the banking sector, revolutionising traditional, in-person banking methods (Souiden, Ladhari & Chaouali, 2020). Long-term profitability and consumer retention are impacted by mobile banking services' inability to sustain continuous engagement among Millennials and Gen Z, despite their high adoption rates (Chougule & Dudekula, 2024). The rise of mobile banking has positioned itself as an innovative and competitive marketing tool for banking services and products (Zhang, Lu & Kizildag, 2018). This dynamic environment compels banks to adapt continuously and underscores the critical importance of modernising their services within the rapidly changing technology landscape (Souiden, Ladhari, & Chaouali, 2020).

However, amidst this transformative wave, the legal framework surrounding banking innovations remains complex, particularly concerning patent protection, as it has traditionally been considered legally non-patentable (Khraisha & Arthur, 2018). The challenges associated with obtaining patent protection for South African banking products and services stem from the lack of legal precedent regarding the patentability of software (Smith & Van Wyk, 2021). The quest for patent protection in the banking sector has been a formidable challenge, particularly in regions like South Africa, where the absence of litigation specifically addressing the patentability of software leaves critical interpretive questions unanswered (Smith & Van Wyk, 2021). The consequences of this shifting landscape have led to an environment where banking products and services have become increasingly undifferentiated, stifling innovation within the industry and resulting in consumer disloyalty (McKinsey Global Banking report, 2019). In response to these challenges, financial and banking institutions have historically turned to strategies such as leveraging first-mover advantages and safeguarding their proprietary innovations through trade secrets (La Belle & Schooner 2020).

Programmable Banking was introduced by Investec Bank in 2022. With the Investec API, consumers can create rules with simple codes that authorise or reject transactions for any Investec Visa Card that is connected to their account (Investec, 2022). PayShap, a new payment service available at the majority of major banks, was introduced by the South African Reserve Bank and BankservAfrica (Baker McKenzie, 2023). PayShap is a low-value, real-time quick

payment platform that aims to lessen the economy's dependency on cash in the economy and increase the convenience of digital payments for small enterprises and consumers alike (South African Reserve Bank, 2023). The emergence of banks that only operate digitally, such as TymeBank, Discovery Bank, and Bank Zero, has also revolutionised the retail banking sector in South Africa (BusinessTech, 2023). These new branchless banks stand out primarily because of their agile offers and more affordable prices, which foster competitive rivalry in the neighbourhood banking market (ITWeb, 2022). In March 2019, Discovery Bank and Vitality Money, the company's main financial products, were introduced (Discovery Bank, 2019). The objective of Vitality Money, a behavioural change programme, is to improve clients' financial health by altering their financial behaviours (Discovery Bank, 2018). Thus, one of the best examples of a company using behavioural insights to create financial products that alter consumers' financial behaviour is Discovery Bank. As a result, Discovery Bank stands as the pioneering and singular behavioural bank globally (Pather & Bedford, 2019).

Probing deeper into the landscape of mobile banking, it becomes apparent that this evolution is intricately tied to the global movement towards digitisation in the banking sector (Druhova, Hirna & Fostyak, 2021; Soubra, 2021). Technological progress has enabled consumers to generate extensive datasets reflective of their behaviours (Hassani, Huang & Silva, 2018). This growth trajectory in consumer-generated data is driven by shifting consumer preferences, especially among Millennials (25-39 years old) and Generation Z (Gen Z) (18-24) (Marous, 2019). As banking systems increasingly rely on technology to cater to the unique behaviours and demands of Millennials and Gen Z consumers, the volume of personal data generated by these consumers has surged significantly (Marous, 2019).

Millennials and Gen Z are considered tech-savvy because they grew up in the digital era (Bank Administration Institute, 2020). Being exposed to smartphones and applications from a young age, Gen Z in particular are deemed to be digital natives (Combs & Twachtman, 2019). Millennials have been among the first to use mobile and internet technology, frequently making use of its benefits (Kim, Jang, Choi, Youn & Lee, 2021; Reisenwitz, 2021; Shin, 2020). Mobile banking applications fit in perfectly with their way of life, which prioritises efficiency and ease.

According to Kumawat and Baskaran (2023), millennials and Gen Z frequently use mobile payment systems like Apple Pay and Google Pay. Given that these two cohorts are accustomed to these systems, they use mobile banking apps because they want integrated financial

experiences that allow them to save, invest, and make payments all on one platform (Kumawat & Baskaran, 2023).

According to Investec (2021), this data-driven transformation is especially crucial given that Millennials and Gen Z collectively represent a substantial market worth over \$3 trillion. In response to these transformative changes, organisations are actively reshaping their operations by adopting digital technologies to engage with consumers across various digital touchpoints (Kalia & Paul, 2020). The banking sector is well-suited to develop extensive mobile banking applications because of its large customer bases and wealth of personal data (Deloitte, 2020).

Furthermore, consumer expectations have evolved in this digital era, with 91% of consumers favouring brands that recognise, remember, and provide relevant offers and recommendations (Accenture Global Consumer Pulse Research, 2018). Nearly half of the consumers expect personalised treatment as loyal consumers and a third are willing to switch service providers if personalisation falls short (Accenture Global Consumer Pulse Research, 2018).

1.1.1 The South African Banking Industry

Before the COVID-19 epidemic, the banking industry had started prioritising how they deliver products and services to consumers to meet the changing consumer expectations (Ernst & Young, 2020). Statista (2021) research reveals that the global banking industry amounted to 530 billion US dollars in 2018. Approximately 300 million Africans are banked, potentially increasing to 450 million in five years from the time of writing (McKinsey Global Banking report, 2018). While 80% of South Africans hold a bank account, a substantial number of the population continue utilising informal channels and transacting in cash (Deloitte Report, 2019).

The South African banking industry comprises 31 banking entities comprising 18 local banks and 13 local branches of foreign banks (South African Reserve Bank Prudential Authority Annual Report, 2021). As of March 2021, the top 5 South African banks, namely; Standard Bank Group, FirstRand Ltd, Barclays Africa Group, the Nedbank Group, and Investec, account for over 90.1 % of total banking assets in the country, valued at approximately R5.8 trillion of the overall R6.5 trillion of the banking industries (South African Reserve Bank Prudential Authority Annual Report, 2021).

South Africa's best digital bank behaviour and experience of online consumers are among the six leading consumer banks: FNB, Capitec, TymeBank, Nedbank, Standard Bank, and Absa (InSites Consulting, 2021). This is attributable to the 97% smartphone penetration in South Africa (Global Mobile Consumer Survey, 2019). The internet and mobile banking category uncovered that Capitec Bank held the prominent position as South Africa's Best digital bank, which FNB previously occupied (InSites Consulting, 2021). The survey further revealed that TymeBank was awarded third place, followed by Nedbank, Standard Bank, and Absa (InSites Consulting, 2021). These results postulate that South African banking consumers interact with banking products and services through a digital platform facilitated by a mobile application or a website (Deloitte Report, 2019).

The COVID-19 epidemic introduced several restrictions along with the concept of social distancing, which remarkably affected the mobility of banks and instigated contactless banking and remote operability (Agnihotri, Kulshreshtha & Tripathi (2021). Researchers Baicu, Gârdan, Gârdan, and Epuran (2020) emphasise that the COVID-19 epidemic contributed directly to the growth of online banking services. Within this evolving landscape, the study focuses on an investigation of the mobile banking apps affiliated with the 5 highest ranking banks in South Africa, namely; Standard Bank Group, FirstRand Ltd, Barclays Africa Group, the Nedbank Group, and Investec. It examines the imperative for these institutions to adapt and evolve the design and functionality of their mobile banking apps to cater for the Millennials and Gen Z of South Africa.

1.1.2 Banking for Millennials and Gen-Z

Dimock (2018) defines Millennials as anyone born between 1981 and 1996 (ages 23 to 38 in 2019) and anyone born between 1997 and 2012 onward is part of a new Gen Z. However, before understanding the banking preferences of the identified generations, it is first necessary to define what constitutes the values and characteristics of these generations. Millennials include 23% of the global population (World Economic Forum, 2021), while GenZ comprises 26% (Truelist, 2021). These cohorts are technology-literate and savvy (Vogels, Rainie & Anderson, 2020). They are the first generation to grow up in a world where technology and the internet are easily accessible (Combs & Twachtman, 2019). Millennials and GenZ are perceived to be the only generations more likely to switch banks for a better digital experience

since the pandemic, probably due to their increased banking use (Bank Administration Institute, 2020).

The Cornerstone (2021) study published in Forbes (2021) reveals that about a fraction of Millennials and Gen Z emphasise the importance of arranging an appointment with their bank's branch through their mobile apps. Having defined some of the attributes of Millennials and GenZ, the study will now discuss the technological aspects that are both similar and different between these two generations. In the study, Table 1 will be used to illustrate how GenZ and Millennials differ in terms of technology. Table 1 shows that both generations are accustomed to using and interacting with technology. Identifying what is unanimously appealing to Millennials and Gen Z would assist in articulating the factors influencing mobile banking's continuous use. Each technology similarity would also advise a point of deviation when it is necessary to market to each generation individually.

Table 1: Technology similarities of Millennials and Gen Z

Technology similarities between Millennials and Gen Z	
They grow up in a technologically advanced environment.	
Technologically savvy and displays proficiency in the use of new technology.	
They are actively using social media and perceiving it as a catalyst for economic value.	
Pursue convenience through technology.	
No technology brand loyalty.	
Digital expectations with brands.	
Privacy and safety of the technology.	

Source: (Kim, Jang, Choi, Youn & Lee, 2021), (Reisenwitz, 2021), (Shin, 2020)

While Millennials and Gen Z have some indistinguishable attributes, it is also essential to identify the technology differences in their target profiles. This allows for recognising each segment and provides valuable ways to action insights when targeting them specifically. Table 2 below illustrates the characteristic technology differences between Millennials and Gen Z:

Table 2: Technology Comparison of Millennials and Gen Z

Millennials	Gen Z
Mobile pioneers.	Mobile natives.
Focused on the usability of technology.	App-friendly and website-savvy.

Co-exist with technology.	Escapes reality through technology.
Focused on the functionality of technology.	High expectations and care about the technology experience.
Longer attention span.	Shorter attention span.
Diverse in-person and technology communication.	Underdeveloped in-person communication and social skills due to reliance on technology.
Predominately prefers traditional social media platforms like Facebook, Twitter, and Instagram.	Predominately prefers visual social media platforms such as Instagram, YouTube, Snapchat and TikTok.

Source: (Ayuni, 2019, p. 169), (Deloitte Digital Consumer Trends 2021), (Tunsakul, 2020)

According to Abu Daqar, Arqawi and Abu Karsh (2021), these two generations are a vital market segment for the banking industry to pay careful attention to. Due to their size, they are projected to spend more than other generations (Dabija & Lung, 2018; Nanda, 2020). Thus, this study investigates the variables that affect Millennials and Generation Z's continued usage of mobile banking in South Africa. Only adult Gen Z born between 1997 and 2004 (ages 18 to 25 in 2023) will be considered for this study.

1.2 RESEARCH GAP AND PROBLEM STATEMENT

The growing usage of mobile phones and wireless technology has transformed how financial services and products are offered (Kinsman, 2019). According to the South African Customer Satisfaction Index (SA-CSI) for Banking Products (2018), the banking industry is experiencing homogenous products. Because these products are undifferentiated, winning the consumers' loyalty is challenging. The impact on consumer satisfaction is due to undifferentiation products (South African Customer Satisfaction Index for Banking Products, 2018).

One in four consumers was identified as ready to switch to another bank (SA-CSI for Banking Products, 2019). The key findings of the SA-CSI for Banking Products (2021) survey reveal that the consumer satisfaction gap between South Africa's big five banks is rapidly closing as they face increasing pressure to re-invent their value propositions and differentiators through emerging technologies. A Financial Sector Outlook (2022) study reveals that the rise in digital adoption has resulted in more consumers using banking apps and online banking platforms to

perform transactions. According to Free Find (2019), the most preferred payment method by consumers in 2019 was an online bank transfer. The First National Bank seeks to simplify its consumer's access to financial solutions in the future by designing a universal application to serve their needs (Nasdaq, 2021). Therefore, highlighting the need for such a study.

The global emergence of new financial innovations is facilitated by recent technological innovations and explored from an international and local perspective (Chipeta & Muthinja (2018). There have been several studies on banking innovations conducted such as Usman, Monoarfa and Marsofiyati (2020) having examined e-Banking and mobile banking's impact on consumer satisfaction in Indonesia. Comparably, Hammoud, Bizri, and El Baba (2018) looked into how customer happiness in Lebanon was affected by the calibre of e-banking services. The key elements impacting Malaysian consumers' behavioural intentions towards mobile banking were investigated by Rehman and Shaikh (2020). Similar to this, Baabdullah, Alalwan, Rana, Kizgin, and Patil (2019) looked into how Saudi Arabian consumers used mobile banking.

Furthermore, Haq and Awan (2020) have investigated the association between e-satisfaction in Pakistan and e-banking service quality and e-loyalty during the pandemic. Locally, research predominantly focuses on adopting and accepting mobile banking apps. For example, Koenait, Maziriri and Chuchu (2021) examined the attitudes toward utilising mobile banking applications among Gen Z consumers in South Africa. Thusi and Maduku (2020) investigated how South African Millennials perceived and utilised retail mobile banking apps. Furthermore, Van Deventer (2020) explored the differences in mobile banking trust amongst Generation Y consumers of the central South African retail banks. However, few studies have investigated mobile banking app curation by integrating personal, experiential, and functional factors and artificial intelligence features within the global and local spheres.

Other studies have also highlighted the use of artificial intelligence (AI) in mobile banking as it plays a critical part in the adoption and usage of mobile banking applications (Lee & Chen, 2022; Rahman et al., 2021; Suhartanto et al., 2021; Yussaivia et al., 2021). Such studies are still lacking in South Africa especially looking at both Millennials and GenZ. Additionally, not much research has integrated the Unified Theory of Acceptance and Use of Technology (UTAUT), information system continuance (ECT-IS), Task Technology Fit, Social Response Theory and the Computers as Social Actors paradigm (CASA) to develop a comprehensive theory of mobile banking application continuous use. Amongst others, some of the gaps

identified in previous mobile banking research include consumer trust in mobile banking apps and the influence of measurements such as performance expectancy, effort expectancy, social impact and security on the behavioural intention of the consumer to use mobile banking services (Aldammagh, Abdeljawad & Obaid, 2021; Lafraxo, Hadri, Amhal & Rossafi, 2018). Consequently, the research will incorporate the following theoretical frameworks: UTAUT, ECT-IS, Task Technology Fit, Social Response Theory, and CASA. to offer a strong theoretical foundation for investigating the elements impacting the ongoing use of mobile banking applications. Applying a single theory limits the potential to address some research questions (Shaw, Tangirala, Vissa, & Rodell, 2018). The integration of theories has become a popular approach and is widely regarded as a potent means of shaping the body of literature (Aldammagh, Abdeljawad & Obaid, 2021). It is now necessary to explain the course of integrating the five theories.

1.2.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

According to research conducted by Abbas, Hassan, Asif, Ahmed and Haider (2018), the UTAUT theory is used to assess technology acceptance behaviours. Scholars Purwanto and Loisa (2020) reveal that the UTAUT factors known as performance expectancy, effort expectancy, social influence, and facilitating conditions impact the usage behaviour of mobile banking. Kwateng, Atiemo, and Appiah (2018) evaluated the variables impacting the acceptance of mobile banking adoption in Ghana using the UTAUT theory and found that not all model constructs of the framework were pivotal in affecting the consumers' behavioural intention to use mobile banking, with performance expectancy, effort expectancy, social influence and hedonic motivation being identified among those that were discovered to be insignificant. Performance expectancy is a factor that impacts mobile banking adoption in Pakistan (Farah, Hasni, & Abbas, 2018; Raza, Shah, & Ali, 2019).

While the UTAUT theory has produced notable insights into predictors associated with the utilisation of mobile banking behaviour, an ethical assessment of the existing literature reveals some of the current accounts on the UTAUT theory have not adequately illustrated the degree of the variables affecting mobile banking app continuous use by employing this theory independently. Therefore, based on the above previous studies, this study seeks to address the limitations in UTAUT research in the context of mobile banking apps by addressing the inconsistent findings in the last five years of research on mobile banking. This will enhance the

existing knowledge on which UTAUT measurements are effectively applied to the consumers' continuous use of mobile banking apps. Additionally, the study observed that the synthesis of the UTAUT findings with performance expectancy and perceived security in mobile banking is yet to be explored. As a result, this study will reinforce the validity of the theory. In general, therefore, it seems that it is prudent for this study to integrate the UTAUT theory.

1.2.2 The expectation confirmation theory of information system continuance (ECT-IS)

The expectation confirmation theory of information system continuance (ECT-IS) is a well-known theoretical framework for comprehending consumers' continuance intentions (Shiau, Yuan, Pu, Ray, & Chen, 2020). To identify the antecedents of electronic finance continuance intention, scholars integrated 2 theories, namely, the technology acceptance model (TAM) and ECT-IS (Zhou, Tsiga, Li, Zheng & Jiang 2018). To ascertain the continued usage of mobile banking apps intention, Kumar, Israel, and Malik (2018) integrated two theories, namely, Self-determination Theory (SDT) and ECT-IS, where the former addressed the evaluation of the motivation and future behaviour of online services and the latter assessed the post-adoption behaviour of services.

According to Shiau et al. (2020), inadequate consideration has been given to the antecedents of the construct "confirmation", which is crucial in influencing consumers' satisfaction and continuance intentions. One criticism of much of the literature on ECT-IS is that it has undermined the critical importance of intrinsic motivation in the consumers' IS usage, which might also be an essential user belief that affects users' continuance intentions (Shiau et al., 2020). Despite some of the limitations of ECT-IS research, the theory certainly adds to our comprehension of the effects of the continuous use of technology. However, considering all of this evidence, it seems necessary to integrate theories to strengthen and solidify the theoretical base. This study will therefore analyse how well ECT-IS is integrated with other theories to determine what aspects affect the continuous use of mobile banking apps.

1.2.3 Task Technology Fit (TTF)

In examining how well-received new technologies are, Abbas et al. (2018) found that the Task Technology Fit (TTF) model is employed to explain the dependency of the fulfilment of the technology task on the consumers' characteristics. According to research by Gupta, Manrai

and Goel (2019), mobile banking consumers will likely consider technology's functional and technical capability. Consumers' perceptions of the technological prowess and functionality of mobile banking apps are observed to be influenced by Artificial Intelligence (AI) capabilities (Payne, Peltier & Barger, 2018, 2021; Suhartanto, Syarief, Nugraha, Suhaeni, Masthura & Amin, 2021). The technological acceptance model (TAM), theory of reasoned action (TRA), theory of planned behaviour (TPB), and theory of technology of acceptance (TTF) were the five theories that Souiden, Ladhari, and Chaouali (2020) integrated to improve the theoretical foundations of their systemic evaluation of mobile banking adoption. TTF evaluates mobile banking technological features, but it doesn't look into all the factors that affect consumer choices to keep using mobile banking apps. This suggests that a comprehensive analysis of the research gap might be possible if it is combined with other hypotheses.

1.2.4 Social Response Theory (SRT)

Social response theory (SRT) posits that in an event technology possesses attributes akin to humans, a consumer is inclined to respond in a humanly social manner (Song, Xing, Duan, Cohen & Mou, 2022). Among the several previous studies, the SRT is based on the CASA paradigm, which illustrates the mindless application of social rules and expectations to technology (Wiethof, Tavanapour, & Bittner, 2021). According to the theory, while users engage with chatbots that are powered by artificial intelligence (AI) on mobile banking apps, they should think about how AI features like anthropomorphism and perceived intelligence influence and shape users' functional assessments (Lee & Chen, 2022). As a result, scholars Wiethof, Tavanapour, and Bittner (2021) found that it would be prudent for consumers to be presented with an artefact that possesses enough cues to perceive it as worthy of social cues. The most important limitation lies in the SRT's primary focus on the social outcomes of consumer-technology interaction, which has been applied mainly to chatbots (Ho, Hancock & Miner, 2018). Thus, this study will apply the theory to assess the variables influencing the continued usage of mobile banking apps.

1.2.5 Computers as Social Actors (CASA)

It has been demonstrated by Liew and Tan (2021) that consumers observe and respond to salient cues exhibited through the technological artefacts with the same social rules originating from human-to-human social routines, notwithstanding their inclination to recognise the artificiality of the artefacts' intents, motivations, or emotions. Given the rapid technological

developments and with particular emphasis on AI, the CASA has ceased to apply only to traditional computers. Still, it has also been extended to address human-computer interactions in various contexts (Feine, Gnewuch, Morana, & Maedche, 2019). According to data from a study by Ho et al. (2018), the benefits of interpersonal emotional expressions also apply to how emotions are perceived when using technology. While the CASA has been employed in a banking environment, it has not articulated how perceived artificial intelligence can induce consistent utilisation of mobile banking apps. To alleviate the shortcoming, it has become therefore essential that this theory be integrated with other theories presented in this study. It is critical to remember that the CASA and the social response theory highlight numerous fundamental social characteristics. The former emphasises technology characteristics similar to humans, resulting in human reaction to technology as a social behaviour guided by human social rules. CASA is underpinned by how humans interpret and perceive technology communication. This assertion demonstrates that consumers expect AI to possess empathy and good communication skills akin to human beings (Pelau, Dabija, & Ene, 2021). With that said, Fortunati and Edwards (2020) observed that consumers would want to communicate through technology and interact with it as partners.

In summary, the accounts provided above illustrate that attempting to address this study's research gap and problem statement without integrating the five theories will limit the extent to which the research question can be addressed by the study.

1.3 RESEARCH OBJECTIVES

The study applied the following theories to achieve the objectives listed below: Task Technology Fit (TTF), Unified Theory of Acceptance and Use of Technology (UTAUT), Expectation Confirmation Theory of Information System Persistence (ECT-IS), Social Response Theory, and Computers as Social Actors (CASA).

1. To investigate personal factors and task technology fit on the adoption of mobile banking apps.
2. To investigate trust in mobile banking apps on adoption.
3. To investigate experiential and functional factors on expectation confirmation.
4. To determine the influence of expectation confirmation, mobile banking app adoption and social response on mobile banking app satisfaction

5. To investigate mobile banking app satisfaction on continuous use
6. To assess artificial intelligence features on trust and social response in mobile banking apps.

1.3.1 Research Question

The primary focus of this study is the variables that impact the curation of a mobile banking app for Millennials and Gen Z in South Africa. As a result, it seeks to answer the following question:

- To what extent do artificial intelligence features and personal, experiential and functional factors influence mobile banking applications' continuous use?

1.4 PRELIMINARY LITERATURE REVIEW

The literature consulted centred primarily on the theories that inform the study. These theories are identified as follows and will be discussed below; unified theory of acceptance and use of technology (UTAUT), expectation confirmation theory of information system continuance (ECT-IS), the task technology fit, the social response theory and the computers as social actors paradigm (CASA).

1.4.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) is one of the most influential and comprehensive theories to analyse consumers' inclination to accept technology products and their intention to adopt the new technology Bendary & Al-Sahouly, 2018).

UTAUT was developed to contextualise consumer actions as they pertain to technology (Nordhoff, Louw, Innamaa, Lehtonen, Beuster, Torrao, Bjorvatn, Kessel, Malin, Happee, & Merat, 2020). The study will investigate the following determinants of UTAUT theory; perceived security, facilitating conditions, performance expectancy, trust, and satisfaction to explore the influence of curating mobile banking apps for the Millennials and Gen Z in South Africa. As a result, it is proposed that:

H1: Perceived security has a positive relationship with a mobile banking app, implying that consumers who perceive banking products as secure (i.e., perceived security) are more inclined to use them (i.e., the mobile banking app adoption).

H2: Performance expectancy has a positive relationship with mobile banking app adoption, implying that consumers who value the perceived benefits of mobile banking apps (i.e., performance expectancy) are more likely to intend to use them (i.e., mobile banking app adoption).

Trust in mobile banking applications: According to research conducted by Arfi, Nasr, Kondrateva, and Hikkerova (2021), when smart devices are used to provide technology services, they can collect, manage, monitor, and analyse individuals' data which raises significant security and trust issues and may affect consumers adoption of these services. It can then be proposed that **H3:** Consumers' trust in mobile banking apps has a positive relationship with the app's adoption.

Mobile banking satisfaction: Satisfaction leads to continuously enhancing product or service usage and assessing consumer response (Wang, Qing, Saqib Khan & Khan, 2021). Studies revealed satisfaction positively impacted continued intentions to use mobile commerce (Marinković, Đorđević, & Kalinić, 2020). Thus it is proposed that **H6:** Consumers' satisfaction with mobile banking apps has a positive relationship with the continuous use of the app.

1.4.2 Expectation confirmation theory of information system continuance (ECT-IS)

According to Zhou et al. (2018), the ECT-IS theory suggests that a user's intention to continue using an artefact driven by an information system is contingent upon three post-acceptance variables: the consumer's contentment, the consumer's confirmation of expectations, and the post-usage perceived usefulness. The basis of the expectation confirmation theory is the consumer's emotional response (satisfaction), experience response (confirmation), and expectations of benefits (perceived usefulness), all of which influence the consumer's decision to keep using the product (Ambalov, 2018). Evidence suggests that an expectation is first developed for a consumer to purchase a product/service, after which purchase performance is assessed (Osang, 2019). At the evaluation stage, the consumer pre-expectation is measured against the actual implementation (Rabaa'i & AlMaati, 2021). This will confirm whether the consumer will continuously use the product/service (Ambalov, 2018). As a result, it can be

hypothesised that **H7**: The consumer's confirmation of expectations from the mobile banking app has a positive relationship with satisfaction with the mobile banking app.

Mobile banking app satisfaction: Consumer satisfaction, according to Cheshin, Adi, Gerben, and Van Kleef (2018), is achieved when a product or service's perceived performance and usage as a result of adoption meet the expectations of the consumer. Consumer satisfaction is highest when they believe the adopted product or service performs better than expected (Meesala and Paul, 2018). The banking sector must increase customer trust in its organisations by providing reliable products and services if it hopes to increase satisfaction with mobile banking products and services (Thusi & Maduku, 2020). Thus, a hypothesis is proposed that **H4**: There is a positive relationship between a consumer's mobile banking app adoption and mobile banking app satisfaction. **H5**: There is a positive relationship between mobile banking app satisfaction and the consumer's trust in the app.

1.4.3 Experiential and Functional Factors

The task technology fit: According to Yi EL, Sng, Leong and Ho (2021), task technology fit is the degree to which technology aids a user in completing their tasks. It is defined as the compatibility of the technology's functionality with the user's capabilities and task requirements (Yi EL, Sng, Leong & Ho, 2021). Consumers' inclination to adopt mobile banking products is positively and directly correlated with task technology fit (Tam & Oliveira, 2019). Thus, it is proposed that **H8**: There is a positive relationship between task technology fit with a consumer's mobile banking app adoption.

Gamification: Scholar Hamari (2019) defines gamification as the transformation of activities, systems, services, products, or organisational structures to afford gamefic experiences. "Gamification refers to designing information systems to afford similar experiences and motivations as games do, and consequently, attempting to affect user behaviour" (Koivisto and Hamari, 2019). Gamification is a concept used to enhance consumer motivation and engagement with activities, systems, or services, wherein the key components of game design in non-game contexts are employed (Tondello, Premasukh & Nacke, 2018). Premised on the definitions above, tailoring the game elements according to a consumer's profile is one way to enhance their engagement with a product or service while collecting their data (Koivisto & Hamari, 2019; Rapp et al., 2019). Considering the aforementioned, it is proposed that **H9**: Gamification of mobile banking apps has a positive relationship with expectation confirmation.

Mobile app interactive quality: Providing desired and relevant products and services in varying service industries requires ample communication between consumers and AI (Araujo, 2018). AI devices that engage automatically in conversations are increasingly used (Pelau et al., 2021). The main predictor of consumer engagement and confirmation with mobile applications or chatbots is interactivity (Ashfaq et al., 2020). Therefore, it can be proposed that **H10:** Mobile app interactive quality has a positive relationship with expectation confirmation.

Mobile app service quality: Service quality is the consumers' attitude established by a long-term evaluation of a mobile commerce service or product performance. (Phuong & Dai Trang, 2018). Jain, Kaul, and Sanyal (2021) state that service quality is essential to a business's long-term success as it helps it achieve competitive parity. Research conducted by Tang, Zhang and Akram (2019) reveals the utility of mobile apps in facilitating product or service expectations fulfilment. As a result, when consumers' expectation is confirmed after using the mobile banking app, they feel satisfied and perceive the product or service as applicable (Gupta, Dhiman, Yousaf & Arora, 2021). It can then be proposed that **H11:** Mobile app service quality has a positive relationship with expectation confirmation.

1.4.4 Social Response Theory

The social response theory finds that people perceive computer information systems as social actors and socially respond to them (Li & Suh, 2021). The social cues embodied in an artefact's design conjure consumers to anthropomorphise technology, i.e. to have perceptions of humanness in the interaction. Furthermore, several research (Gnewuch et al., 2018; Diederich et al., 2019) suggest that perceptions of social presence are influenced by the availability of social cues. Anthropomorphism is defined by scholars Lin, Zheng, and Lee (2021) as a system that acts like a human while performing a function or activity.

Consumers are inclined to interact and engage with technology to the degree that the experience resembles that of a human, implemented through aesthetic cues driven by anthropomorphism (Han, 2021). Social responses and associated perceptions of anthropomorphism can contribute to positive consumer perception of products and services, resulting in product and service satisfaction (Gnewuch et al. 2018; Diederich et al. 2019c). It can then be proposed that **H12:** Social response positively correlates with satisfaction from using a mobile banking app. **H13:** Perceived anthropomorphism has a positive relationship with the social response.

1.4.5 Computers as social actors

The computers as social actors (CASA) postulate that consumers turn their conscious attention to a subset of cues from a computer system which causes them to categorise computers as social entities ignoring that the computers do not possess human attributes (Feine et al., 2019). The CASA paradigm suggests that computers can demonstrate the potential for social interaction through anthropomorphic appearance cues (e.g., having a human-like face or form) or behaviour (Fox & Gambino, 2021). Research conducted by Cambre and Kulkarni (2019) reveals that through the CASA paradigm, human-to-human interactions might inform how consumers respond to social forms of technology, such as trust. Thus proposed that **H14**: Perceived anthropomorphism has a positive relationship with trust in the mobile banking app.

Perceived Intelligence: It has previously been observed that consumers' trust in AI is premised on their perceptions of trustworthiness (Stanton & Jensen, 2021). The particular reliability of the AI system is influential insofar as the consumer perceives it (Busu & Gyorgy, 2020). According to Kaya, Schildbach and Schneider (2019), trust is a function of consumers' perceptions of AI trustworthiness attributes. Thus, it can be hypothesised that **H15**: Perceived artificial intelligence has a positive relationship with consumer trust in a mobile banking app.

Perceptions of artificial intelligence service delivery: AI devices may increase the consumer's quality of life by taking over certain activities they do not like to do (Busu & Gyorgy, 2020; Gursoy, Chi, Lu & Nunkoo, 2019; Lu, Cai & Gursoy, 2019). This is evident in the case of the COVID-19 pandemic, which relied on AI devices, robots being used for disinfecting hospitals and treatment rooms, as well as delivering medicine or food to patients, as the risk of contracting the virus is greater for humans than for AI devices (Vinas, 2021). It can then be proposed that **H16**: Perceptions of artificial intelligence service delivery have a positive relationship with a consumer trusting in a mobile banking app.

1.4.6 Conceptual diagram

This section presents the conceptual diagram for the study and lists the hypothesis statements.

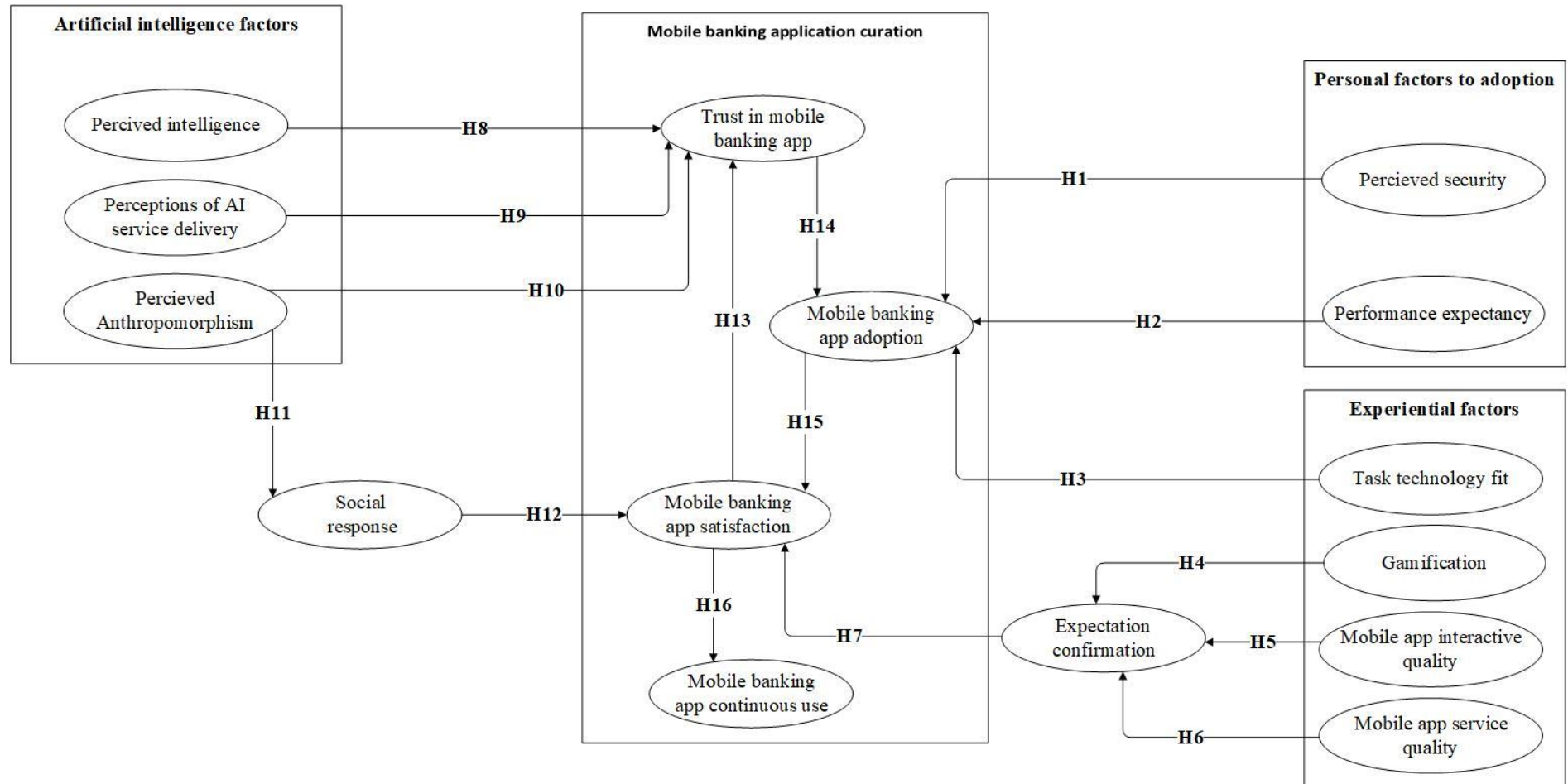


Figure 1: Conceptual Model

1.4.7 Hypotheses

H1: Perceived security has a positive relationship with a mobile banking app, with the implication that consumers who perceive banking products as secure (i.e., perceived security) are more inclined to use them (i.e., the mobile banking app adoption).

H2: Performance expectancy has a positive relationship with mobile banking app adoption, with the implication that consumers who value the perceived benefits of mobile banking apps (i.e., performance expectance) are more likely to intend to use them (i.e., mobile banking app adoption).

H3: There is a positive relationship between task technology fit with a consumer's mobile banking app adoption.

H4: Gamification of mobile banking apps has a positive relationship with expectation confirmation.

H5: Mobile app interactive quality has a positive relationship with expectation confirmation.

H6: Mobile app service quality has a positive relationship with expectation confirmation.

H7: The consumer's confirmation of expectations from the mobile banking app has a positive relationship with satisfaction with the mobile banking app.

H8: Perceived artificial intelligence has a positive relationship with consumer trust in a mobile banking app.

H9: Perceptions of artificial intelligence service delivery have a positive relationship with a consumer trusting in a mobile banking app.

H10: Perceived anthropomorphism has a positive relationship with trust in the mobile banking app.

H11: Perceived anthropomorphism has a positive relationship with the social response.

H12: Social response has a positive relationship with satisfaction derived from using a mobile banking app.

H13: There is a positive relationship between mobile banking app satisfaction and the consumer's trust in the app.

H14: Consumers' trust in mobile banking apps has a positive relationship with the adoption of the app.

H15: There is a positive relationship between a consumer's mobile banking app adoption and mobile banking app satisfaction.

H16: Consumers' satisfaction with mobile banking apps has a positive relationship with the continuous use of the app.

1.5 RESEARCH DESIGN AND METHODOLOGY

1.5.1 Research Philosophy and Approach

A researcher's chosen stance in their study is known as research philosophy. The positivist research philosophy will be employed in this study. This philosophy utilises observable reality to garner data. According to Mark, Saunders, Philip Lewis, and Adrian Thornhill (2019), this philosophy evaluates empirical consistencies and causal linkages to develop lawlike generalisations. A research approach is how the data will be collected, analysed, and interpreted, and these research approaches can either be deductive or inductive (Mark et al., 2019). The proposed study is designed to evaluate the validity and applicability of a theoretical framework in a proposed empirical context, showing its characteristics of having a deductive research design. This approach is based on testing an existing theory (Streefkerk, 2019). The deductive approach is suited for this study because existing theories and literature will be used to establish explanations and compile propositions that can be tested (Mark et al., 2018).

1.5.2 Research strategy and methodological choice

The research strategy plays a pivotal role in determining how data will be collected, supporting the research philosophy that will be followed, and whether a survey, case study, experiment, or action research will be carried out (Mark et al., 2018). This study will collect data using questionnaires to test the proposed conceptual model and observe the findings through statistical tests (Rahi, 2017). All the constructs in the study will use a 5-point Likert scale designed as 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The methodological choice for the study is the quantitative method which discourages bias throughout the research (Bryman, 2015). Quantitative methods focus on gathering data from a large sample of people, are scientific, and are measured through objective opinions or actions that seek to describe a set of data (Rahi, 2017). In answering this study's research question, the investigated hypotheses can be measured and described, and therefore a quantitative method will be used to conduct this research.

1.5.3 Target population and sample

According to Dahabreh, Haneuse, Robins, Robertson, Buchanan, Stuart, and Hernán (2021), a population is an entire group that a researcher is interested in concluding from, and a sample is

a proportion of the people that data will be collected from. According to Hair, Hult, Ringle, and Sarstedt (2017), partial least squares structural equation modelling (PLS-SEM) should be used when the intention is to evaluate key measurement constructs when the model includes formative measurement constructs when the structural model is intricate and contains multiple constructs, when the sample size is small or not normally distributed, and when the latent variable values will be used later in additional analyses. Previous studies and literature on mobile banking apps illustrate that in most studies, a sample size that ranges from 200-600 respondents is used (Koenait, Maziriri and Chuchu, 2021; Humbani & Wiese, 2019; Chigori, Viljoen, Ford & Cilliers, 2020). With the highly regulated banking industry, attaining banking data for Millennials and Gen Z mobile banking usage data is impossible. Consequently, the choice of a sample size comprising 500 participants was driven by a synthesis of findings from the primary literature and a meticulous evaluation of banking regulatory limitations.

Data will be obtained from Millennials and Gen Z consumers who use South Africa's five largest banks. These banks were chosen for the study based on their high consumer usage and availability of mobile banking services (South African Reserve Bank's most recent Prudential Authority Annual Report, 2021). Based on time constraints, the study will not consider the equal distribution of the sample across the banks. The study will make use of non-probability quota sampling, which is a convenient means of extracting samples using non-randomized techniques that typically rely on judgment (Iliyasu & Etikan, 2021). Quota sampling strives to achieve the best representation in the final sample of respondents (Iliyasu & Etikan, 2021).

1.5.4 Data Collection and Administration

A self-administered questionnaire with two primary components will be used in the study to collect data. Questions about screening and demographics are asked in the first section. The suggested conceptual model measurement constructs are presented in the second part. The survey will be distributed by email, Twitter, LinkedIn, Facebook, Instagram, WhatsApp, and other online channels. The survey will take the form of an introductory letter to assure participants that their identity will be protected and outlining the criteria for finishing the study and the research purpose.

1.5.5 Research design

Data Analysis

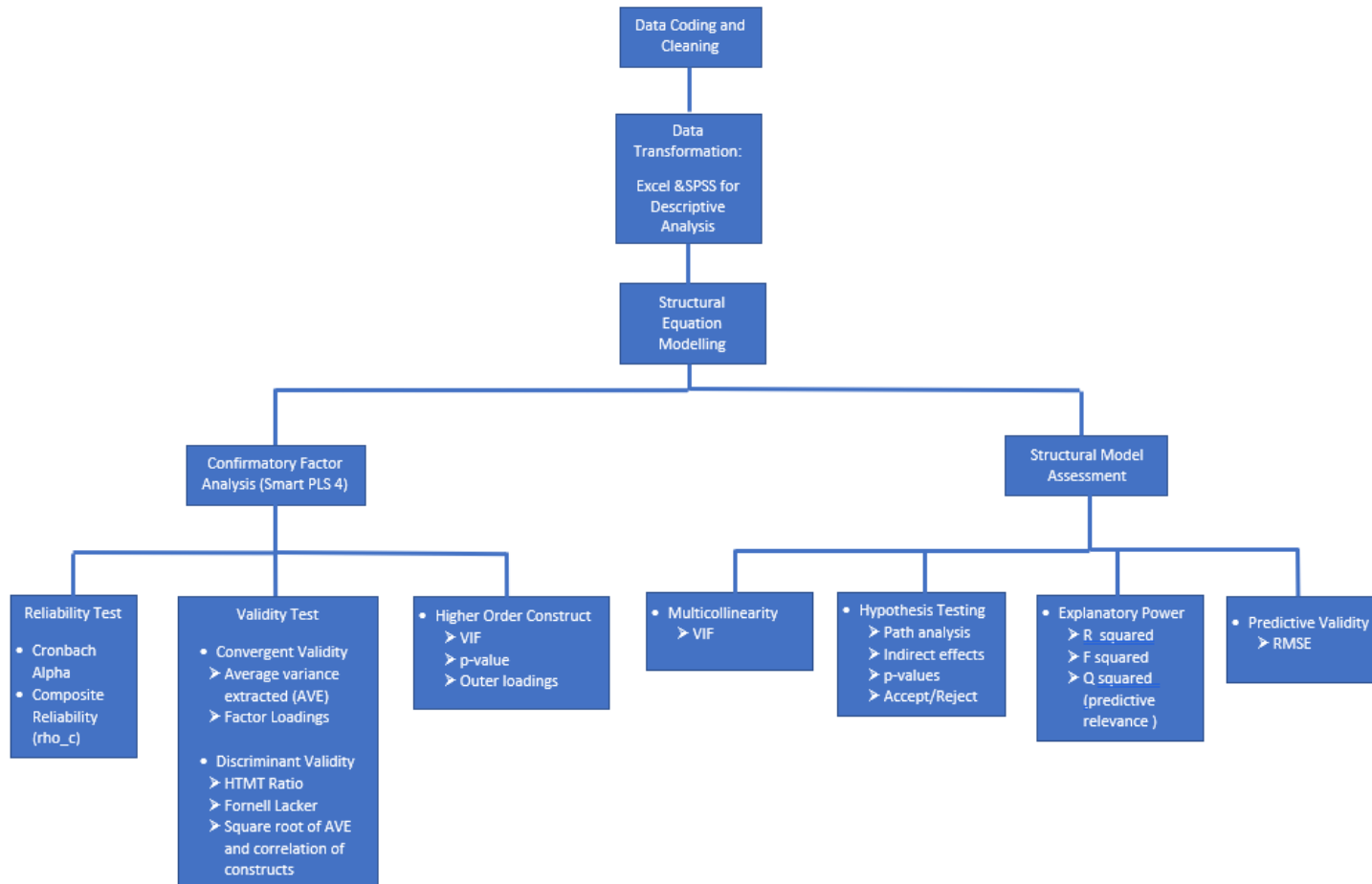


Figure 2: Data Analysis

The PLS-SEM approach with SmartPLS software will be used in the study to test the suggested research conceptual model. The structural model used to test the study hypotheses will be evaluated when the measurement model's validity has been determined.

Data Analysis Approach

Data analysis procedure and statistical approach

Statistical analysis of the study's model and hypothesis evaluation are the goals of this part of the research. Data collected for this study will be coded using Excel spreadsheets.

Measurement Model Assessment

Reliability and Validity tests of measurement scales

Validity is the extent to which the instruments being used measure what they are supposed to measure, whereas reliability is the measurement's consistency (Al-Emran, Mezhuyev, & Kamaludin, 2018). Cronbach's α value and the composite reliability (CR) will be used to evaluate dependability. Measurement reliability is indicated by composite reliability (CR) and a Cronbach's α value threshold of ≥ 0.7 (Mark et al., 2019). Items will be examined to see if they load on their corresponding (a priori) constructs with loadings larger than 0.5 in order to guarantee convergent validity. Al-Emran et al. (2018) state that the average variance extracted (AVE) values will be used to verify discriminant validity, while also making sure that there are no significant cross-loadings of inter-research variables.

To further support the existence of discriminant validity across the study constructs, the square root of the AVE of each component should be larger than the correlations between that factor and every other factor (Sarstedt et al., 2020). As suggested by Sarstedt, Ringle, Cheah, Ting, Moiescu, O.I. & Radomir (2020), the AVE value ought to be ≥ 0.5 . The research will also make use of the Heterotrait-Monotrait Ratio of Correlations (HTMT) (Sarstedt et al., 2020) to confirm discriminant validity.

1.6 CONTRIBUTIONS OF THE STUDY

This study will lead to insights beneficial to various interest groups in the following manner;

1.6.1 Marketing practitioners

This study will benefit marketing practitioners by contributing to the growing knowledge of consumer behaviour and consumer experience where mobile banking technology is used. The study can also inform banking marketing strategies on which factors to consider for mobile banking apps.

1.6.2 Academia

The study will contribute to the literature by developing an integrated model that takes into account five theories UTAUT, ECT-IS, Task Technology Fit, Social Response Theory and the CASA that take into account AI features, personal, experiential and functional factors in the curation of mobile apps suited for Millennials and GenZ. Therefore, the study will provide literature expansion within the area of mobile and retail banking

1.6.3 Banking industry

Consumer data held by banks is a potential goldmine but is still proving hard to access due to legacy technology. As a result, the banking industry is not optimally using consumer behavioural data to provide relevant products and services. This study will be beneficial as it will provide insights into how to curate mobile banking apps that compel the Millennials and Gen Z cohorts to engage and adopt them.

1.7 ETHICAL CONSIDERATIONS

This study requires observation of consumer data, such as the intent thereof will be shared with the respondents and permission requested. Before distributing the questionnaire to the respondents, it is prudent to acquire ethical clearance from the University Ethics Committee for the study. The obtained ethical approval will be attached to the questionnaire to validate this study's adherence to ethical research principles. The questionnaire structure will contain the following, a cover letter which will describe the aim of the research and assure confidentiality of responses to the potential respondents. The respondents will be informed of their participation's voluntary nature and may choose not to participate at any time during the data-gathering procedure. If the respondents require further clarification or need to raise any ethical concerns, the questionnaire will also include the contact details of the researcher and the supervisor.

CHAPTER 2: THE BANKING INDUSTRY - A GLOBAL AND SOUTH AFRICAN PERSPECTIVE

2.1. INTRODUCTION

Chapter 1 presented an overview and justification of the study. In addition to providing a rationale for the study, it detailed the methodology and literature adopted by the research. Before examining the variables impacting mobile banking's continuous usage amongst Millennials and Gen Z, it is essential to discuss the nature of the industry that impacts this study, the banking industry. This chapter's first section offers a global overview of the development of banking from Bank 1.0 to Bank 4.0. The state of the worldwide banking industry will be discussed, followed by a discussion of the banking industry concerning emerging economies with a focus on Africa. The chapter then analyses the issues and developments confronting the South African banking sector. To finish, the chapter will present a comprehensive analysis of the banking sector.

2.2 THE BANKING INDUSTRY

The banking sector, a crucial part of the world's financial system, provides numerous financial services to individuals, businesses, and governments (Chishti & Barberis, 2019; Trigo Gamarra & Perales, 2020). Banks stimulate economic growth by directing funds toward profitable investments (Amberg & Westerholt, 2019; Trigo Gamarra & Perales, 2020). The financial sector, which includes the banking industry, is one of the vital elements of the economy that fosters growth and controls the speed and quality of change (Litvishko, Beketova, Akimova, Azhmukhamedova & Islyam, 2020). The banking industry has been defined differently in the world of finance. Therefore, it's essential to know what it covers. The International Monetary Fund (2021) describes the banking industry as a network of financial institutions governed by laws and providing banking products and services. These services include mortgage facilities, investment opportunities, credit offerings, and transactional options (Economic Times, 2022). According to the Corporate Finance Institute (2022), a bank is a group of financial entities that manage credit facilities, cash storage, investments, and other financial operations, this is another way to describe the banking sector. These institutions also generate credit and direct funds toward profitable ventures, which promotes economic expansion (Amberg & Westerholt, 2019; Trigo Gamarra & Perales, 2020). It is sufficient to mention that the banking industry is

typically defined as an economic sector that provides financial services and products to both individuals and businesses (Chen, Kumara & Sivakumar, 2021).

It is essential to specify how the study will use the term because different researchers have different definitions of the banking business. As a result, the study adopts the Corporate Finance Institute (2022) definition. The banking sector consists of licensed banks lawfully required to offer their consumers financial products and services. The banking sector directs money to borrowers with profitable investments, and is one of the fundamental forces behind most economies (Corporate Finance Institute, 2022). Since Banca Monte Dei Paschi di Siena, the world's first bank, opened its doors in 1472, the banking sector has been developing (Broby, 2021). According to Lanning (2020), there are 44,000 banks and credit unions worldwide, the bulk of which are smaller businesses that specialize in offering specialized financial services to rural areas. After defining the term, the study will explore the banking industry's evolution. The growth of the banking sector is shown in Figure 2. This leads to a more detailed discussion of the banking industry's growth in the section that follows.

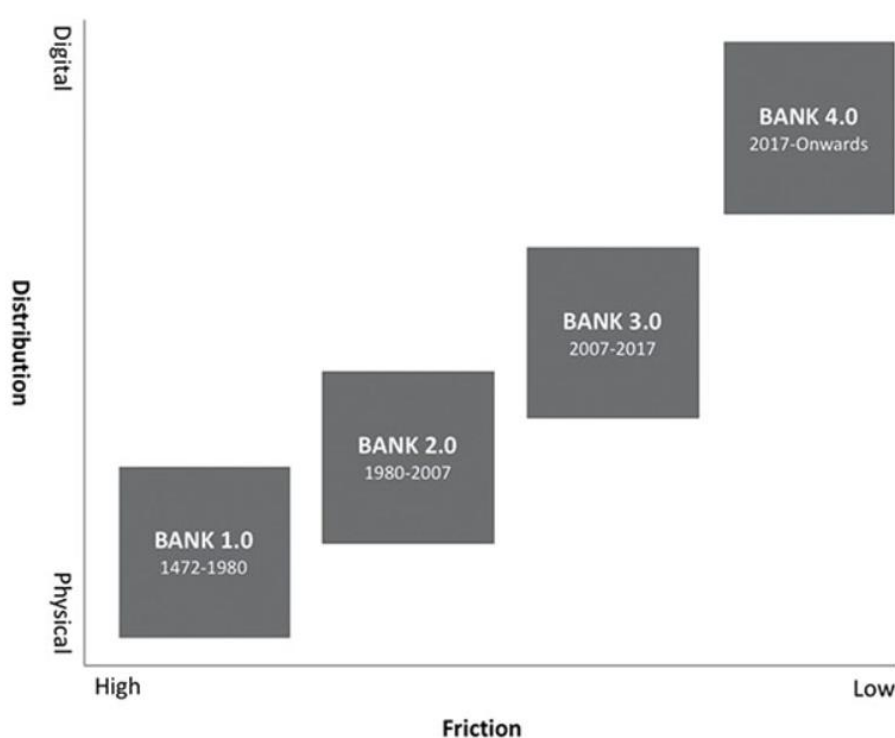


Figure 3: Bank Evolution Timeline

Source King, (2018)

Based on Figure 2 above, King (2018) expands on the layers as follows :

- BANK 1.0: Traditional, historical banking with the branch as the principal access point. In the 12th century, the Medici family began;
- BANK 2.0: The advent of self-service banking, as defined by the first attempts to allow access outside bank working hours. It started with ATMs and escalated with the commercial internet in 1995;
- BANK 3.0: Banking when and where you need it, as redefined by the smartphone's introduction in 2007 and expedited by a shift to mobile payments, peer-to-peer lending, and challenger banks built on top of mobile; channel agnostic;
- BANK 4.0: Real-time, embedded banking supplied through the technological layer. Real-time, contextual experiences, seamless interactivity, and a smart, AI-based advising layer dominate. Mostly digital omnichannel with no physical distribution constraints.

The banking system is a critical pillar of economic growth and macroeconomic stability (Mehdiabadi, Tabatabeinasab, Spulbar, Karbassi Yazdi Birau, 2020). However, the evolution of each country's banking sector is influenced by the constantly changing dynamics of the international banking architecture and economic environment (Mehdiabadi et al., 2020). Maturity models provide detailed advice for defining, assessing, and evaluating the current condition of the banking sector on its route to Industry 4.0 (Bandara, Vidanagamachchi, & Wickramarachchi, 2019). Figure 3 illustrates the banking industry's maturity in Industry 4.0.

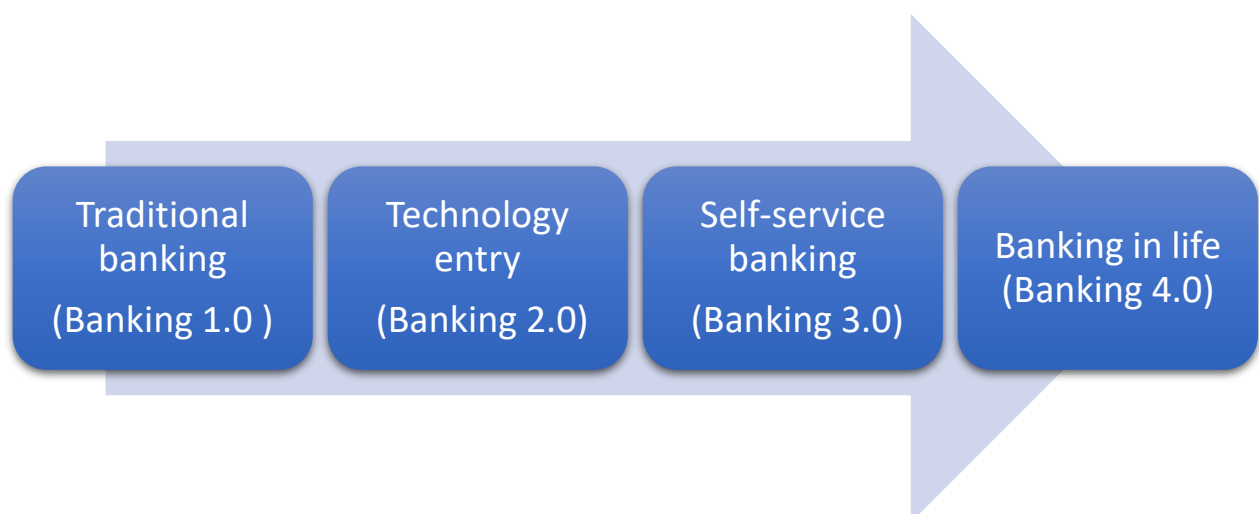


Figure 4: Banking Evolution

Source: Mehdiabadi et al. (2020).

2.2.1 Traditional Banking (Banking 1.0)

Banks adopted a traditional operating model before developing the technology since they served as the key financial intermediaries in the economy (Mehdiabadi, Tabatabeinasab, Spulbar, Karbassi Yazdi & Birau, 2020). As a result, the economy's constant expansion was a requirement for the stability and effectiveness of banking operations (Melnik, Kuchkin, & Blyznyukov, 2022). According to Scharaga (2020), the term conventional banking model is occasionally used to refer to financial institutions, such as commercial banks, savings and loan organisations, and credit unions that accept deposits from borrowers. As part of their operations, they lend borrowers money obtained from their depositors (Scharaga, 2020). Many credit institutions make up this regulated model, with assets mainly concentrated in larger banks and bank branches unevenly distributed around the nation (Melnik et al., 2022).

The banking industry is rapidly evolving as a result of environmental shocks, evolving and modernising digital technologies, the advent of the digital era, and the introduction of new services (Naimi-Sadigh, Asgari & Rabiei, 2022). The transition from traditional to digital banking has made it easier for banks to apply their specialist business strategies to a greater range of goods and services (Mehdiabadi et al., 2020). This includes security/investment banking and wholesale loans, both of which help their consumers (Florii, Giansante, Girardone, & Pammolli, 2021).

2.2.2 Technology entry (Banking 2.0)

On June 27, 1967, the first automated teller machine (ATM) was installed in front of a Barclays bank branch in Enfield, north London (Nwannunu, 2020). The bank provided the consumer with a printed voucher and a six-digit security code (Walker & Morris, 2021). The bank held the voucher, and the consumer's account may be debited once the banking staff removed the vouchers from the vending machines (Walker & Morris, 2021). On September 2, 1969, the Chemical Bank installed the first modern ATMs; the Docuteller, a product of the Docutel Corporation, had its premiere in New York (Klinger, Adams & Howley, 2022). Docutel is frequently credited with creating the ATM because they were the first to receive a US patent (Klinger, Adams & Howley, 2022). These ATMs were the first to accept bank-issued cards and security keys, or PINs, as they are now known (Nwannunu, 2020). The ATMs had a basic level of sophistication. ATM efficiency, speed, and user interface all improved in the 1990s. Other self-service devices, such as cash deposit machines and check deposit machines, became

widely available to consumers, although the ATM function remained the same (i.e., cash delivery) (Naimi-Sadigh et al., 2022). Walker and Morris (2021) claim that by the 1980s, telephone banking was readily accessible at numerous banks in Europe and America. Telephone banking activities involved an operated call centre where consumers could communicate with call centre agents using an automated pre-recorded voice response system (Goddard & Wilson, 2016). This signalled the beginning of the banking sector's digital transition (Naimi-Sadigh et al., 2022) provide another definition of digital transformation, describing it as a collection of steps organisations take to adopt new digital technologies to pique their interest and drastically alter the performance of an organisation with a focus on disruptive technologies. The description of the current situation of the banking sector worldwide is what comes next. To view their account information on their home computer, clients had to pay a charge when online banking was initially introduced in the USA in 1980 (Walker & Morris, 2021).

2.2.3 Self-service banking (Banking 3.0)

One of the primary ways banks could engage with clients in banking 1.0 and 2.0 was a face-to-face engagement at the branches (Mehdiabadi et al., 2020). Consumers communicate with banks only through their neighbourhood bank manager or banker (Walker & Morris, 2021). Bank 3.0 includes a banking service whenever you need it. Bank 3.0 was improved by mobile banking and the arrival of smartphones in 2007 (Walker & Morris, 2020). Text-based user interfaces for mobile banking were made practical in the late 1990s when web browsers were accessible (Lin & Weintrop, 2021).

2.2.4 Banking in Life (Banking 4.0)

The development of the technological landscape has impacted every area of the banking business due to the introduction of 5G networks (Mehdiabadi et al. 2020). Emerging technology has made it possible for various applications and cross-industry collaborations that were before simply a pipe dream. According to Cividino et al. (2019), Industry 4.0 implies that technology has impacted every aspect of society, including communication, transportation, finance, and production. According to Moshime (2020), Bank 4.0 is a change in the banking sector that includes voice-based intelligent assistants that help clients with payments, bookkeeping, investments, and general inquiries. Incorporating powerful artificial intelligence

technology, Bank 4.0 provides access to real-time help targeted to the consumer's needs and assesses a consumer's affordability (King, 2018). Bank 4.0 is about new capabilities, new jobs, and skills that underwrite competencies banks have never needed before (Boobier, 2020).

These developments are driven by digital integration (with devices and processes capable of transmitting and processing vast masses of data) and automation (the availability of machines capable of carrying out tasks of medium-high complexity) (Muscio & Ciffolilli 2019; Rossini et al., 2019). The pervasiveness of the Internet and smart mobile phones, along with the introduction of technologies such as the Internet of Things, biometrics, big data, advanced analytics, artificial intelligence, blockchain, etc., has created an organisational focus on designing and developing pre-designed products and services (Okwu, Tartibu, Maware, Enarevba, Afenogho & Essien, 2022). This has resulted in personalisation and customisation for the consumers (Okwu et al., 2022).

One of the industries that have changed a lot due to the advancement of technology is the banking industry, but it seems that these changes continue. The development of technology has revolutionised all industries in the world, and the banking industry is no exception (Banker 2019). Research conducted by Oshadhi, Kasuni and Ruwan (2019) reveals that the applications of Industry 4.0 are also rapidly growing in the financial sector. The impact is felt as modern consumer expectations have risen with the technological improvements; they value relationship-centric experience that hinges on trust and personalisation while receiving unlimited accessibility, convenience, and speed of service (Oshadhi et al., 2019). Bank 4.0 is a modern banking platform based entirely on digital technology with no physical interaction between consumers and banks (Luthfi, Sabil & Kusuma, 2020).

Figure 3 below presents a few of the technology-related attributes that fuel the era of banking 4.0.

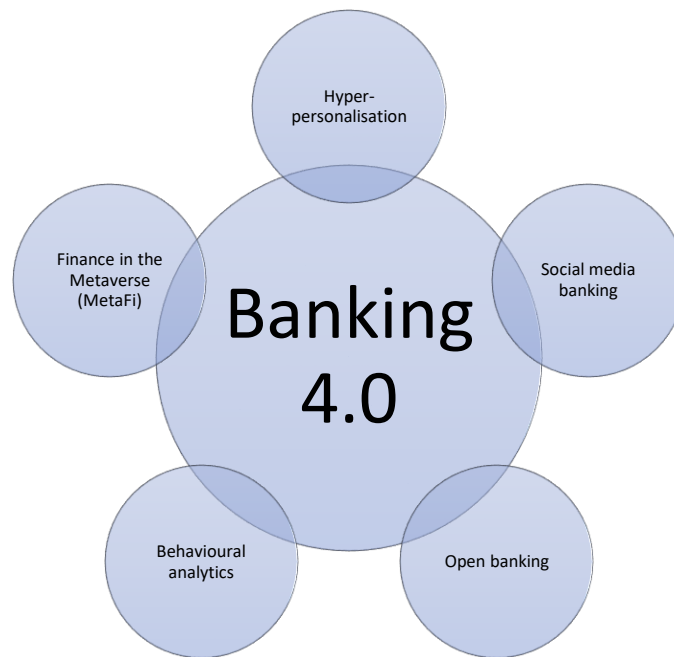


Figure 5: Fourth-Generation Banking Attributes

Source: Mehdiabadi et al. (2020). Items transformed for the study.

2.2.4.1 Hyper-personalisation

Research conducted by Poornima and Chitra (2020) reveals that hyper-personalisation of data may be the next game changer because this may completely alter how businesses in equity markets will be carried out daily. Scholar Peters (2021) describes hyper-personalisation as the advanced segmentation and customisation often touted as the future of experiential marketing and comes in the form of personalised experiences, tailored search results, and recommendations on what to do based on past behaviour and traits. Hyper - personalisation provides information on the target group of consumers, whose specifications are determined by their preferences regarding products, designs, technology, prices, colours, and other information (Hassaneen, 2020). Marketers can make lead nurturing more relevant and valuable by strategically using behavioural and demographic data to create hyper-personalised offerings and aligning with the sales team to shorten the sales cycle (Young, 2020). The banking industry is dependent on consumer connections. In a world where one's consumers (and even prospective consumers) double as brand ambassadors, it is crucial to dig into the details and understand their mindset (Waupsh, 2022). Research conducted by Guruvayur (2021) reveals that hyper-personalisation of the banking sector is expected by the consumers wherein rather than meeting the specific demands of the machine, the system should facilitate the devices to adopt human reasoning and decision-making. According to Chatterjee (2019), hyper-

personalisation in e-commerce is not conceptually novel. Hyper-personalisation may have been a trend that provides a competitive advantage, and it will soon become a standard for every e-commerce company (Keen, Adnan, Razak & Anuar, 2023). Failure to personalise will then mean a lack of commercial viability and an inability to retain consumers (Waupsh, 2022). Hyper- personalisation as a marketing strategy is becoming more refined, with technology-imbued modes of assessing needs, tastes and preferences and the e-commerce sector is steadily inching towards hyper-personalisation (Chatterjee, 2019)

A cognitive banking architecture must be adopted for the banking industry to stay hyper-consumer-centric and need ubiquitous access to financial services across legacy & newly emerging access channels, customised services, and proactive and hyper-personalised service delivery (Guruvayur (2021). Figure 6, adapted from the Mckinsey & Company – Building the AI Bank of the Future (2021), illustrates the mechanics involved in the hyper-personalisation of banking products and services.

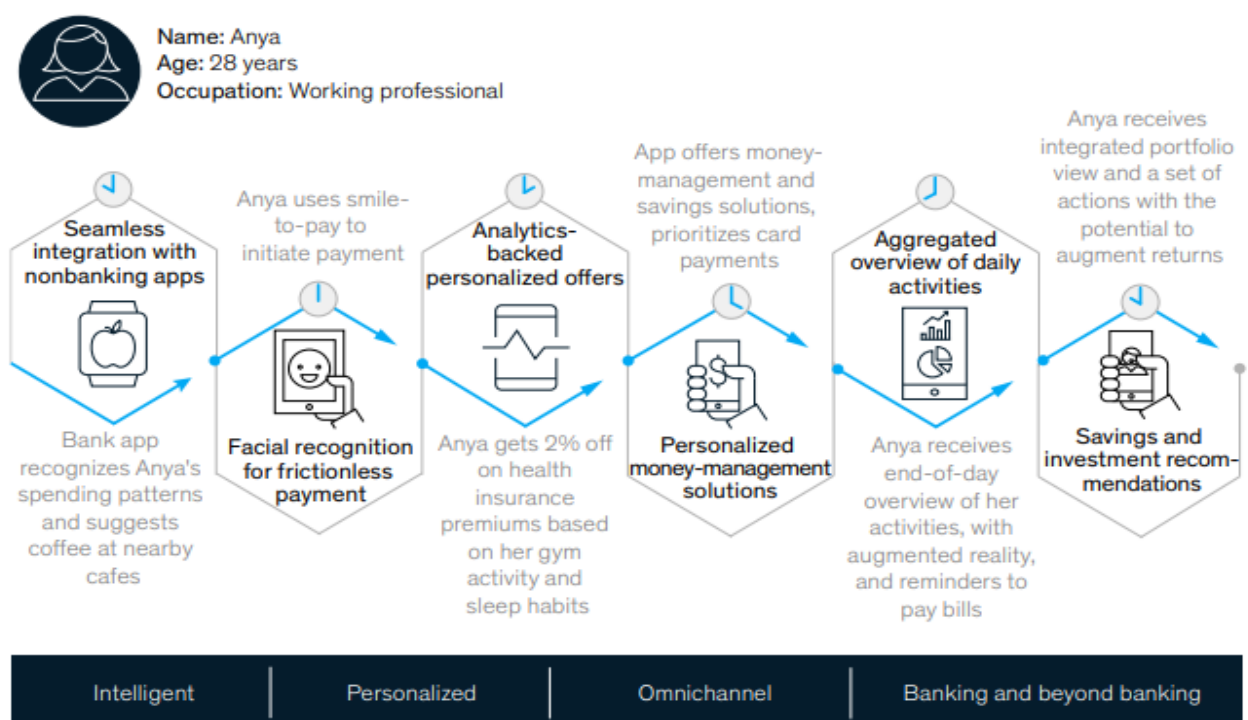


Figure 6: Consumer Products And Services Personalisation

Source: McKinsey & Company – Building the AI Bank of the Future (2021).

In mobile banking, hyper-personalisation greatly increases consumer pleasure and engagement by utilising artificial intelligence and sophisticated data analytics to provide highly customised

experiences (Reznicek, 2023). Hyper-personalisation makes mobile banking apps more appealing and useful to South African Millennials and Gen Z, who value personalised experiences in their digital interactions (Vidali, 2021). A more intuitive and user-centric experience is produced by tailoring features, recommendations, and user interfaces to each user's unique financial habits and preferences (Popova, 2019). It can be inferred that a user-centric experience encourages consistent usage.

Understanding the varied needs and cultural quirks of Millennials and Gen Z in South Africa allows for the creation of hyper-personalised features that resonate with their preferences (Sorgdrager, 2021). This will increase the overall effectiveness and retention of mobile banking apps (Popova, 2019). The continuous utilisation of mobile banking apps benefits from hyper-personalisation by delivering relevant insights, targeted promotions, and personalised financial advice (Reznicek, 2023). This not only fosters a sense of connection with the app but also aligns with the expectations of younger demographics who seek tailored solutions that cater to their unique financial goals and lifestyles (Khalifa & Ali, 2023). In conclusion, hyper-personalisation is important because it can offer customised, user-centred experiences, which is why Gen Z and Millennials in South Africa may continue to utilise mobile banking apps (Oloveze, Ogbonna, Ahaiwe, & Ugwu, 2022). Hyper-personalisation boosts the value proposition of mobile banking by utilising cutting-edge technologies to comprehend and predict individual demands (Chatterjee, 2019). This helps banks establish a stronger bond and longer-lasting engagement with the younger generation in the constantly changing digital space (Yesiloglu & Costello, 2020).

2.2.4.2 Social Media Banking

Organisations increasingly leverage social media tools to access knowledge from external actors, particularly consumers to facilitate the innovation process and firm performance (de Zubielqui, Fryges & Jones, 2019). Worldwide, 3.2 billion people use social media, about 42% of the population (Emarsys 2019). About two-thirds of adults are on Facebook, with over 2.32 billion active users monthly (Pew Research Center, 2018). Social media is not just the playground of the younger generations (Choedon & Lee, 2020.). Although 90.4% of Millennials and 77.5% of GenXers embrace social media, so do 48.2% of Boomers. On average, users spend 2 hours and 22 minutes daily on social media and messaging

(GlobalWebIndex, 2018). Global social media usage is expected to reach 5.85 billion people by 2027 (Statista, 2023).

According to Digital Banker Africa (2021), it is expected that 30% of African consumers will use online banking; this ratio means that increasing social media usage for financial services can help the banks reach a more significant and younger audience. Digital Banker Africa (2021) suggests that social media banking can assist banks with the following:

- Consumer engagement
- Relationship banking
- Creating a brand identity for the banks
- Ignite consumer confidence.
- Segmentation and targeting
- Consumer acquisition, interaction, and retention

The American Bankers Association investigated how banks use social media trends, obstacles, possibilities, management techniques, and prospects (ABA, 2019). Over 430 US banks of all sizes provided data for the survey, revealing diverse social media use levels for various objectives (ABA, 2019).

- Communication – 91%
- Marketing and sales – 84%
- Risk management (monitoring complaints, etc.) – 76%
- Customer service – 74% • Recruiting – 70%
- Competitive analysis – 41%
- Conducting research – 35%

Based on the information above, social media can indeed be a key role payer in the banking industry. Social media platforms are already utilised by banks for real-time updates, brand marketing, and consumer engagement (Ahmed, Aboutabl & Galal, 2022). The integration of financial services into well-known social media platforms, known as social media banking, caters to the communication and preference preferences of younger generations and enhances their mobile banking experiences (Eren, 2021).

Because of this convergence, South African Millennials and Gen Z can carry out banking operations, communicate financial information, and complete financial transactions all within the social media platforms that they regularly use (Mwaniki, 2021; Azionya, 2022). In keeping with the social nature of these generations, the incorporation of financial services into social media platforms not only streamlines transactions but also cultivates a feeling of community around financial conversations (Dewindaru, Syukri, Maryono & Yunus, 2022).

Adding social networking components to mobile banking apps improves their use over time (Vahdat, Alizadeh, Quach, & Hamelin, 2021). A more participatory and interesting financial experience is made possible by features like peer-to-peer payments, expense sharing, and real-time financial data (Jameaba, 2020). Social media integration in mobile banking is in line with Gen Z and Millennials' digital lifestyles, which prioritise ease of use, connectedness, and the capacity to juggle social media and financial operations with ease (Katz, Ogilvie, Shaw & Woodhead, 2022; Snyder, 2021). Social media banking is especially important in South Africa, where mobile technology has taken the lead as the main means of accessing a variety of services, including banking (Msweli, & Mawela, 2021). It not only illustrates how financial services may change to accommodate evolving user habits, but it also speaks to younger consumers' need for seamless, user-friendly experiences (Ho & Chung, 2020). This fit with their social life helps keep users using mobile banking apps over time and increases user retention (Hossain, Xi, Nurunnabi & Hussain, 2020). In conclusion, social media banking's capacity to combine social connections with financial operations makes it relevant to South Africa's Gen Z and millennial populations' ongoing usage of mobile banking apps. This combination not only makes transactions easier but also speaks to the younger generations' connected digital lifestyles, which makes mobile banking apps in the area more appealing and easier to use overall (Lindborg, 2023).

2.2.4.3 Open banking

The KPMG Banking Systems Survey (2018) predicted that the era of Industry 4.0 would herald innovation in the finance sector called Payment Services Directive II (PSD2). This is likely to become a huge game changer in the banking sector. The PSD2 constitutes the 'Open Banking' concept, where banks share customer transaction and account data with third parties, including

retailers, telco providers, payments services and financial account aggregators KPMG Banking Systems Survey (2018). Regulatory and technological advancements known as "open banking" allow third parties to access customer information and payment services provided by banks and other financial organizations. (Couto et al., 2019). Open banking is characterised by TIBCO banking software as a safe interoperability platform for the banking sector (Al-Radaideh & Al-Madi, 2021). It allows third-party payment services and providers to access financial data and banking transactions from banks and other financial institutions (Couto et al., 2019). Banks can use this chance to grow their customer base by providing new and enhanced goods and services. (Al-Radaideh & Al-Madi, 2021).

Strong security measures are needed for Open Banking deployment to protect and prevent the exploitation of consumer data (Couto et al., 2019). Financial organisations must therefore create safe data-sharing frameworks and procedures to ensure data privacy (Al-Radaideh & Al-Madi, 2021). Open banking is a phenomenon that the banking sector is seeing proliferate and revolutionary development that helps consumers and financial organisations in various ways. However, deploying Open Banking calls for robust security measures and adherence to legislative frameworks to guarantee data privacy and security. Financial institutions must overcome these obstacles to fully profit from this technology as Open banking usage keeps expanding. Figure 5 illustrates the structure of open banking and how it impacts other financial intermediaries and benefits both the industry and its consumers.

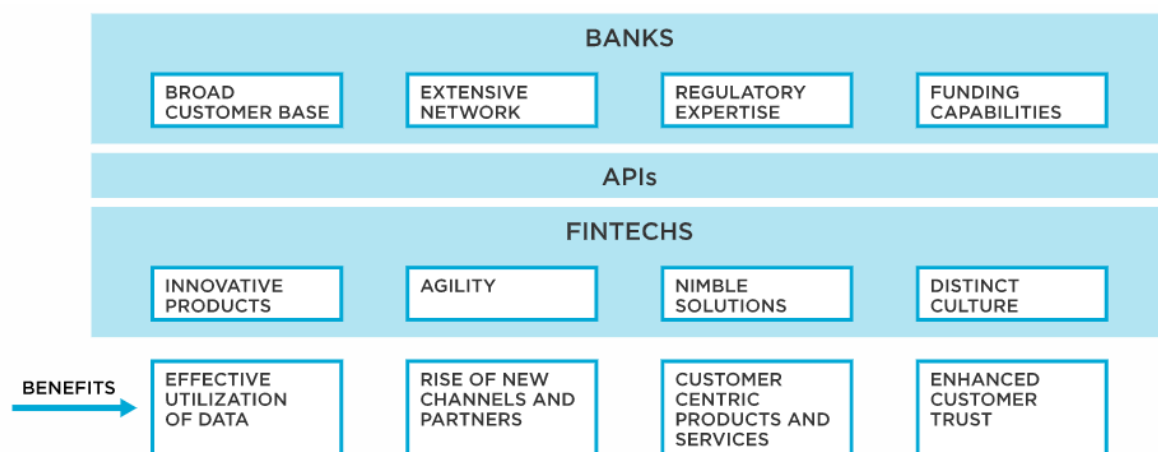


Figure 7: TIBCO Open Banking Process

Source: TIBCO Software (2018).

The integration of various financial services and third-party applications into mobile banking platforms is made easier by open banking (Moysan & Rudnicki, 2019). The openness of banking data enhances the mobile banking experience, meeting the varied financial demands and preferences of the younger generation, with options such as investing platforms and budgeting tools (Plaitakis & Staschen, 2020; Reynolds & Chidley, 2019). Additionally, open banking gives consumers more authority over their financial information. Transparency and digital autonomy are important to Millennials and Gen Z, who gain from the opportunity to safely share their data with reputable third-party apps (Kaabachi, Ben Mrad & Barreto, 2022). As a result, consumers may enjoy a more customised mobile banking experience, complete with recommendations and insights based on their unique financial goals and habits.

Open banking has the potential to encourage financial inclusiveness in South Africa, where technological breakthroughs are drastically changing the financial landscape (Chitimira & Magau, 2021). More people, especially those who might have been traditionally underserved, have increased accessibility to banking solutions thanks to the integration of multiple financial services within mobile banking apps (Pazarbasioglu et al., 2020). This inclusivity supports South Africa's efforts to foster financial inclusion and literacy while also being in line with the goals of the younger generation (Shipalana, 2019). In conclusion, open banking is relevant to South Africa's Millennial and Gen Z population because it can promote financial inclusivity, improve user experience, and encourage innovation in mobile banking apps. The availability of open banking data not only broadens the range of services offered but also gives the younger generation more influence over how they manage their finances in the rapidly changing digital environment.

2.2.4.4 Behavioural Analytics

Behavioural analytics is a methodology that blends data analytics and behavioural psychology to find patterns in human behaviour (Li et al., 2019). It entails examining consumer interactions with goods and services and then utilising this information to enhance the customer experience (Kim & Lee, 2019). Behavioural analytics is a multidisciplinary field that has recently attracted much attention (Gensler et al., 2019). It is employed in several areas, including marketing, finance, and healthcare (Fisher et al., 2019). Behavioural analytics is used in the financial sector to comprehend consumer behaviour, manage risks, and detect fraud (Shin & Kim, 2019).

Behavioural analytics can be utilised in the banking industry to enhance consumer experience, marketing tactics, and fraud detection and prevention (Kim & Lee, 2019; Wang, Wang, & Li, 2019). Fraud detection and prevention is one of the primary uses of behavioural analytics in the banking industry (Kim & Lee, 2019). Using behavioural analytics, banks can spot out-of-the-ordinary behaviour patterns that could point to fraudulent activities, such as account takeover or phishing efforts (Shin & Kim, 2019). Banks can identify and proactively avoid potential fraud by analysing user behaviour patterns and tracking real-time transactions (Kim & Lee, 2019).

The consumer experience in the banking industry can be enhanced with the use of behavioural analytics (Wang et al., 2019). Banks can use data analysis to learn more about how consumers utilise their goods and services and to spot any problems that may detract from their overall satisfaction. For instance, banks may employ behavioural analytics to pinpoint locations where consumers are having trouble navigating their websites or mobile apps or encountering delays in gaining access to services. Banks may deliver a more streamlined and tailored consumer experience by addressing these problems (Wang et al., 2019). In the banking industry, marketing is a significant area in which behavioural analytics is used (Grewal et al., 2019). Banks can utilise behavioural analytics to learn about the tastes and behaviour of their consumers and then adjust their marketing plans accordingly (Singh & Mohanty, 2019). For instance, banks may use data analysis to determine which marketing channels are most effective in reaching various consumer segments or customize marketing messages based on each customer's unique behaviour (Grewal et al., 2019).

Behavioural analytics can be applied to banking industry risk management, fraud detection, customer experience, and marketing. (Zhu, Wu, & Liu, 2019). Banks can identify and mitigate possible hazards by monitoring client behaviour patterns (Ulbricht & Welzel, 2019). Banks may employ behavioural analytics, for instance, to spot clients more likely to default on loans or to spot regions where credit risk may be rising. (Zhu, Wu, & Liu, 2019). In the banking industry, behavioural analytics can increase cross-selling and upselling prospects (Grewal et al., 2019). Banks can determine the goods and services likely to interest-specific consumers and adjust their cross-selling and upselling techniques based on their understanding of customer behaviour patterns and preferences (Grewal et al., 2019). Credit scoring is one of the banking industry's most significant behavioural analytics applications (Zhu et al., 2019). Banks can utilise behavioural analytics to learn more about the creditworthiness and behaviour of

their consumers and then use this knowledge to make better and more educated loan choices (Zhu et al., 2019).

The effectiveness of banking operations can also be increased using behavioural analytics (Brynjolfsson et al., 2019). Banks can spot places where operational processes can be slowing things down or creating bottlenecks by looking at consumer behaviour patterns and then taking proactive steps to make these processes more efficient (Brynjolfsson et al., 2019). Behavioural analytics can also be applied to the banking industry to increase compliance (Shin & Kim, 2019). Real-time monitoring of consumer behaviour patterns and transactions allows banks to spot possible. Financial institutions and scholars alike may learn more about how Gen Z and Millennials use mobile banking apps by utilising behavioural analytics. This covers information on transaction trends, frequency of use, favoured features, and even the emotional reactions connected to financial transactions. It is possible to tailor mobile banking apps to better match user expectations and preferences by having a deeper understanding of these behavioural subtleties (Gu, Bapna, Chan & Gupta, 2022).

Furthermore, behavioural analytics can enhance the security and customisation of mobile banking services (Amiri, Heidari, Darbandi, Yazdani, Jafari Navimipour, Esmaeilpour, Sheykhi & Unal, 2023). The examination of user behaviour patterns aids in the detection of irregularities and possible security risks (Chehri, Fofana & Yang, 2021). At the same time, it makes it possible to apply customised features, alerts, and rewards that align with the unique habits and tastes of Gen Z and Millennials. In South Africa, where the use of technology is growing quickly, financial institutions find that behavioural analytics is an essential tool for navigating the complex and ever-changing world of mobile banking (Matsetlo, 2020). Behavioural analytics insights may guide strategic choices, propel user engagement programs, and aid in the creation of customised financial services and products that address the particular requirements of younger consumers (Suherlan & Okombo, 2023). It is critical to apply behavioural analytics to the continuous utilisation of mobile banking apps by the South African Gen Z and Millennials (Windasari, Kusumawati, Larasati & Amelia, 2022).

The banking sector has significantly transitioned recently, with Millennials and Gen Z increasingly relying on mobile banking apps. (Agnihotri et al., 2019). Due to this, there is more interest in using behavioural analytics to comprehend and enhance consumer engagement and loyalty. (Luo et al., 2019). Behavioural analytics is an effective technique that can be utilised

to understand client behaviour. (Wang et al., 2019). Banks can better understand how consumers use mobile banking apps and spot recurring patterns of behaviour that can be leveraged to enhance the user experience by studying customer interactions with these apps. (Gensler et al., 2019).

Consumer segmentation is a crucial use of behavioural analytics in the realm of mobile banking apps (Li et al., 2019). By studying customer behaviour, banks can segment their clientele based on their usage habits and preferences (Shin & Kim, 2019). This data can create customised marketing campaigns, goods, and services tailored to each customer segment's requirements. Additionally, behavioural analytics can be used to find vulnerabilities or problems with mobile banking apps. (Fisher et al., 2019). Banks can spot possible improvement areas by examining behaviour patterns and taking the necessary steps to rectify them. (Zhu et al., 2019). For instance, banks can utilize behavioural analytics to pinpoint frequent mobile banking app user problems and create fixes for them (Aazam, Khan, & Abdullah, 2019; Brouwer, Hafkamp, & Hoekstra, 2019).

Fraud detection is a crucial use of behavioural analytics concerning mobile banking apps (Grewal et al., 2019). Banks can identify suspicious activity and take appropriate steps to stop fraud by examining behaviour patterns (Kim & Lee, 2019). Banks, for instance, can employ behavioural analytics to spot anomalous spending habits or transaction histories that can point to fraud (DeFilippis et al., 2019; McKinsey & Company, 2019; KPMG, 2019). In conclusion, behavioural analytics is a potent tool that can be utilised to learn more about consumer behaviour in the context of Millennials and Gen Z's ongoing use of mobile banking apps. Banks can identify fraudulent activity, generate tailored marketing campaigns, solve possible problems with mobile banking apps, and increase consumer engagement and loyalty by examining behaviour patterns.

2.2.4.5 Finance in the Metaverse (MetaFi)

Technology is changing society in many ways, a paradigm shift in the way people engage with and perceive the digital world is represented by the Metaverse, which is typified by immersive digital environments (Bratu & Sabău, 2022). It explores building virtual spaces that are connected, providing new opportunities for employment, leisure, and social interaction. This phenomenon offers new opportunities and challenges for users navigating this changing

landscape, encapsulating the essence of a reality mediated by digital means (Mehta, Pancholi & Saxena, 2023).

Metaverse is a term used to describe a virtual environment where people can engage virtually using social media, online gaming, virtual reality (VR), augmented reality (AR), blockchain technology, and cryptocurrency (Al-Gnbri, 2022). Due to the confluence of the real and virtual worlds, avatars can partake in an array of activities in the Metaverse, including creativity, entertainment, socialising, and trading (Yang, Zhao, Huang & Zheng, 2022; Allam, Sharifi, Bibri, Jones, Krogstie, 2022). The Metaverse is a shared virtual environment that is immersive and offers a variety of activities for its members, who are represented by avatars (Vidal-Tomás, 2022). Since this virtual world has its economy and currencies with which users can trade any item, economic governance and metaverse commerce are two of its key elements. (Lee et al., 2021). Various financial services will be required to sustain the Metaverse's operations as it grows (Citi Bank, 2021). Metaverse finance (MetaFi) is anticipated to be a hybrid of traditional finance (TradFi), decentralised finance (DeFi), and centralised finance (CeFi), with new products created primarily to cater to the specialised requirements of the new ecosystem (Citi Bank, 2021). From early capital generation to facilitating trade inside the Metaverse, financial services have the potential to play a major role in the growth of MetaFi (Lee et al., 2021).

A shared virtual world for several users, the Metaverse allows users to engage in a variety of activities and enjoy immersive experiences (Vidal-Tomás, 2022). Economic governance and metaverse commerce are among the primary aspects because it has the economy and currencies and allow users to trade almost any item (Lee et al., 2021). The demand for financial services will increase as the Metaverse develops. To support its operations, a variety of financial services will be needed. As a result, MetaFi will likely combine traditional finance (TradFi), decentralised finance (DeFi), and centralised finance (CeFi), as well as brand-new financial products designed specifically for the Metaverse ecosystem (Citi Bank, 2021).

Simultaneously, the study of South Africa's continuous use of mobile banking apps by Millennials and Gen Z reveals a unique aspect of the technology environment. Here, the emphasis is on the useful integration of technology into routine financial activities, especially as seen through the eyes of Gen Z and Millennials. It is becoming clear that technology is changing traditional financial behaviours as these groups use mobile banking apps more and more (Thusi & Maduku, 2020; Abu Daqar, Arqawi & Abu Karsh, 2021). Examining this trend

in South Africa is especially important because of the country's distinct socioeconomic situation and increasing smartphone accessibility. Despite their apparent differences, the Metaverse and research on mobile banking have a similar overall influence on the perception of how technology shapes different aspects of modern life (Nguyen, Duc, Dang & Nguyen, 2023.). Through its lens into the future of digital interactions, the Metaverse offers insight into how social, professional, and recreational domains may change in the future (Mehta et al, 2023). The study of mobile banking in South Africa, meanwhile, emphasises the concrete ways that technology is transforming financial practices and reshaping economic environments by grounding these technological advancements in the realities of daily life. When taken as a whole, these fields of study help us understand the complex relationship between technology and the consumer experience and help us understand how the digital era is changing.

2.3 MOBILE BANKING

Recent years have seen a sharp rise in the use of mobile banking apps, which provide users with a convenient and speedy way to manage their finances (Almutairi, Almutairi, Almutairi & Alsheail, 2022). Today's mobile banking apps offer various services that let users access their accounts from any location, making them a crucial part of the banking industry. Consumers can access financial services whenever and wherever they want with the help of mobile banking apps because they are very adaptive and accessible (Alalwan et al., 2017; Farah et al., 2018). Consumers can utilise these apps to conveniently access a variety of financial services from their mobile devices (Tam & Oliveira, 2017). Amongst other functionalities, consumers can make investments, pay bills, transfer money, and check account balances (Farah, Hasni, & Abbas, 2018). With mobile banking apps, account information can be accessed quickly and securely without visiting a bank branch (Hassan & Wood, 2020).

According to Malaquias and Hwang (2019), mobile banking apps are beneficial to banks since they offer a platform for banking that is both highly effective and reasonably priced. Banks may continue innovating their mobile banking services to attract and keep clients while maintaining a competitive edge (Sharma, Govindaluri, Al-Muharrami & Tarhini, 2017). Because mobile banking apps enable banks to improve their services while lowering operational costs, retail banks, in particular, have been a preferred method of transacting (Baabdullah et al., 2019). Although mobile banking apps have many benefits, privacy and

security issues are still seen to be eminent (Kakati, 2020; Olawumi, 2020). The potential hazards of mobile banking, such as identity theft or illegal access to account information, must be made clear to consumers (Suhartanto, Dean, Ismail, & Sundari, 2020). Banks must prioritise security measures to guarantee that consumers can conduct financial transactions safely and securely.

Mobile banking apps have entirely changed how we manage our finances by giving us a convenient and efficient way to access financial services whenever and wherever we are. They come with several benefits, including cost-effectiveness and ease, for both clients and institutions. However, to ensure that clients perform their financial operations safely and securely, it is necessary for consumers to be aware of the possible hazards connected to mobile banking and for banks to prioritize security measures.

2.4 AN OVERVIEW OF THE GLOBAL STATE OF THE BANKING INDUSTRY

2.4.1 Global Market Performances

Significant shifts have occurred in the global banking industry in recent years, with digital banking emerging as the main engine of growth (Wewege, Lee & Thomsett, 2020; Pazarbasioglu, Mora, Uttamchandani, Natarajan, Feyen & Saal, 2020). This rise has been attributed to the significant advancements in mobile phone penetration as well as the creation of mobile internet technologies, including 3G and 4G connections (Owusu et al., 2020; Picoto & Pinto, 2021; Sharma, 2019). The COVID-19 epidemic and the need for social distancing protocols have expedited the shift to digital banking, which is expected to reach 3.6 billion users globally by 2021 (Business Insider Intelligence, 2021).

Additionally, the pandemic has accelerated this transformation, and banks that have invested in digital capabilities will probably be in a better position to service their consumers (Deloitte, 2021). Mobile banking apps have grown particularly crucial, with app usage expected to increase by 45% globally in 2020 (App Annie, 2021). Therefore, it is evident that digital banking is growing in significance within the global banking sector and that this development will probably continue over the next several years. Due to this expansion, mobile banking app downloads increased significantly in emerging areas like India and Brazil (App Annie, 2021).

In general, the previous few years have seen a considerable change in the direction of digital banking, and this trend is only anticipated to continue (Deloitte, 2021). The COVID-19 epidemic has accelerated this shift, which may make banks that have made investments in digital capabilities better positioned to serve their consumers going forward (Deloitte, 2021).

2.4.2 Global market challenges

Various causes, such as disruptive technology, escalating competition from FinTech companies, altering business models, and rising regulatory and compliance requirements, are causing the banking industry to transform considerably (Accenture, 2019; Deloitte, 2021). These obstacles have produced a challenging environment for the banking industry, which must traverse several global problems to stay competitive and relevant (Madhav & Tyagi, 2022.). The COVID-19 epidemic's effects on the global economy, geopolitical unrest, evolving consumer trends, and changing regulatory frameworks are just a few of these challenges (McKinsey & Company, 2020; PwC, 2020). The COVID-19 epidemic has sped up the transition to digital banking and highlighted the significance of solid risk management frameworks and consumer engagement initiatives. (McKinsey & Company, 2020). Consequently, banks are under intense pressure to invest in new technology, personnel, and partnerships to adapt to the changing environment and create long-term business models (PwC, 2020).

2.4.2.1 Increasing Competition

The banking sector is experiencing significant disruption due to growing competition from FinTech companies, new business models, and higher regulatory and compliance expectations (PwC, 2019). Targeting lucrative industries and providing consumers with an easy-to-use interface is how FinTechs are upending the market (Deloitte, 2020). These businesses are anticipated to wrest more than \$4.7 trillion in annual revenue from reputable financial services companies, (Goldman Sachs, 2020). Traditional banks and credit unions are looking into partnering with and purchasing FinTech companies to address this potential challenge (PwC, 2021). In addition, they understand that to remain competitive, they must learn from FinTechs (Accenture, 2021). As a result, the sector is going through a considerable change toward innovation and digital transformation to stay relevant in the present business environment (McKinsey & Company, 2021).

2.4.2.2 A Cultural Shift

Technology, including the financial industry, is ubiquitous and profoundly entrenched in our culture (Huang & Rust, 2018). The banking business is undergoing a cultural transformation as technology gets interwoven within the sector and how it operates (PwC, 2019). Because of this, banks are realising that they must embrace digital transformation and adopt a technology-first mentality (Accenture, 2021). Banks must look at technological solutions to address the financial sector's issues (PwC, 2021). This cultural change is consistent with the widespread acceptance of digital transformation across industries (IDC, 2019). To accomplish this, the banking sector must promote an innovative culture using technology to improve current processes and procedures for maximum effectiveness (KPMG, 2020). Additionally, banks must invest in people, create organizational structures enabling technological innovation, and promote this cultural shift (McKinsey, 2019).

The banking industry's cultural move toward technology-driven solutions is a reaction to market constraints and shifting consumer expectations. Banks must embrace this change, promote an innovation-driven culture, and guarantee that their workforce has the required technologies to be competitive (PwC SA Major Banks Analysis, 2022; Deloitte, 2020; McKinsey & Company, 2019).

2.4.3.3 Regulatory Compliance

Given the significant increase in regulatory costs compared to revenues and credit losses after the 2008 financial crisis, regulatory compliance has emerged as one of the banking industry's most pressing challenges (PwC, 2019). The Dodd-Frank Act, Basel's risk-weighted capital requirements, and the Financial Account Standards Board's Current Expected Credit Loss (CECL) and Allowance for Loan and Lease Losses (ALLL) standards are just a few of the regulations that banks and credit unions must abide by to meet this challenge (KPMG, 2019). Compliance may be a significant resource and frequently calls for the capacity to correlate data from diverse sources (Deloitte, 2019).

To stay abreast of the most recent regulatory developments and implement the controls necessary to satisfy those requirements since failure to comply carries substantial consequences, banks have increased their expenditures and risks (without a proportionate boost to risk reduction) (KPMG, 2019). To identify and reduce compliance risks, technology is

essential for fostering a culture of compliance. It can collect data, analyse it, and provide reports (Al Wahshi, Foster & Abbott, 2022). Additionally, it enables businesses to stay abreast of regulatory and business policy changes, ensuring procedures are followed precisely and consistently (PwC, 2019).

Technology advancements like automation and artificial intelligence can significantly increase the effectiveness and precision of compliance operations (Accenture, 2019). These tools can help businesses identify and assess compliance risks and enhance their overall compliance posture (KPMG, 2019). Organisations can manage the rising complexity of regulatory standards using technology used in regulatory compliance. Using technology, businesses can increase their data collection, monitoring, and reporting capacity, lowering compliance costs and the possibility of regulatory fines (McKinsey & Company, 2019). Table 3 lists the principal banking regulations. For financial institutions to keep the confidence of their clients and regulators as well as to avoid legal and reputational concerns, compliance with these standards is essential (Glaessner, 2019).

Table 3: Major Banking Regulations

Banking regulations	Definition
ALLL	Financial organizations create a reserve called the Allowance for Loan and Lease Losses (ALLL) based on the expected credit risk of their assets. The ALLL offsets prospective losses from nonpayment or other future default types. Financial institutions must periodically evaluate the sufficiency of their ALLL and make any necessary adjustments in response to changes in credit quality, loan volume, and other pertinent variables.
AML and KYC	Financial institutions must implement policies and procedures to stop money laundering and terrorist funding per AML and KYC rules. These standards include

	customer due diligence guidelines, reporting requirements, and record-keeping guidelines.
Basel Accords	The Basel Committee on Banking Supervision developed the Basel I, II, and III sets of international banking regulations, establishing minimum capital requirements for banks based on their risk profiles.
CECL	The Financial Accounting Standards Board (FASB) recently released a new accounting standard called Current Expected Credit Loss (CECL), which mandates financial institutions evaluate expected credit losses throughout a loan rather than just experienced losses. With this method, banks must estimate anticipated losses by considering various variables, such as economic forecasts, historical loss data, and current market conditions.
Data Protection Regulation (GDPR)	This EU law governs the handling and safeguarding of personal data. How financial organizations gather, use, and preserve client data is subject to tight regulations.
Dodd-Frank Act	This U.S. law seeks to ensure banks maintain sufficient capital reserves to cover their risk exposure and prevent systemic risks to the global financial system.
European Market Infrastructure Regulation (EMIR)	Increasing transparency and lowering systemic risk in the derivatives market are the two goals of the European Union's (EU) European Market Infrastructure policy (EMIR) policy. Market participants must report and take steps to reduce risk due to

	the central clearing requirement for standardized OTC derivatives.
Sarbanes-Oxley (SOX)	This U.S. law specifies SOX or the Sarbanes-Oxley Act Standards for corporate governance and financial reporting, passed in 2002. It mandates that publicly traded corporations establish sufficient internal controls over financial reporting and sets criminal penalties for non-compliance.

Source: (Moody's Analytics, 2019). PwC. (2019), (Federal Reserve System, 2021)

2.4.3.4. Changing Business Model

Financial institutions must change their business operations in response to the banking sector's numerous difficulties (Hallerberg et al., 2019). The rising cost of compliance management, which has become a key component of banks' overall cost structure, is one crucial issue (Berger et al., 2019). As a result, to sustain profitability and satisfy regulatory obligations, banks are being compelled to alter their business models (Ziolo, Filipiak & Tundys, 2021). The financial institutions are reportedly dealing with a changing business model due to several banking sector difficulties, including rising compliance management expenses (KPMG, 2019). The increasing cost of capital, low interest rates, shrinking return on equity, and declining proprietary trading are all factors that are putting further strain on banks to alter their business models (Hallerberg et al., 2019; Ratnovski & Huang, 2019). Many banks focus on fee-based revenue streams and expand their product offerings to serve their clients better and maintain profitability (Deloitte, 2019). Due to these difficulties, traditional banking earnings sources are under threat (KPMG, 2019; Arner et al., 2019).

Financial institutions are therefore pressured to change their business models and look into new revenue streams like wealth management and online banking (KPMG, 2019; Arner et al., 2019). Additionally, financial institutions are looking into cost-cutting options and chances for mergers and acquisitions to increase scale and efficiency (KPMG, 2019; Arner et al., 2019). Technology utilisation is also having an increasingly significant impact on how the banking industry conducts business. With the development of digital banking, many banks are spending money on innovative technology to enhance customer service and expedite business processes (Deloitte, 2019). Data analytics is utilised to acquire insights into customer behaviour and find

new business prospects. At the same time, automation and artificial intelligence are being used to improve compliance processes and save operational costs (Berger et al., 2019). The banking industry's evolving business models reflect the need to adjust to a quickly changing regulatory environment and shifting market dynamics (Wewege, Lee & Thomsett, 2020). Financial institutions can continue providing value to their consumers and stakeholders while embracing technology and implementing innovative tactics while remaining competitive and compliant (Popelo, Dubyna & Kholiavko, 2021).

2.4.3.5 Rising Expectations

Banks are implementing cutting-edge technologies and digital solutions in response to increased client expectations to serve their evolving demands better (Nijland, 2019). According to a poll by Accenture, 68% of consumers expect their banks to offer more individualized experiences, and 70% of banking clients worldwide use digital channels for their banking needs (Accenture, 2019). Modern banking consumers have higher expectations since they want their banking experiences to be more individualized and convenient (Kumar & Sharma, 2019). This is particularly true for younger generations, including Millennials and Gen Z, who have grown up with technology and have higher expectations for digital experiences (Kumar & Sharma, 2019; global. Hitachi-solutions, 2020). According to a survey by Global. Hitachi-solutions (2020), 47% of Millennials prefer to use mobile banking apps, making them the majority of mobile banking consumers. Furthermore, the survey revealed that 56% of Millennials prefer to communicate with brands on social media. Five out of six times, millennials stated they would rather communicate with brands on social media (PwC, 2019).

Considering this growth, banks should expect Gen Z and succeeding generations to be more committed to and knowledgeable about omnichannel banking (PwC, 2019). Baby Boomers and older Gen Xers often value interpersonal interactions and choose in-person branch visits (Stöckl et al. 2019). While still meeting the preferences of older generations who value human interaction and prefer to visit actual branch sites, banks must adjust their services to match the wants of younger clients (global. Hitachi-solutions, 2020). This tendency will likely continue as future generations commit to and grow more knowledgeable about omnichannel banking (Kumar & Sharma, 2019). Banks increasingly rely on data analytics to help them comprehend their consumers' requirements and preferences and provide individualised products and services (Bhatia, Khan, & Pathak, 2019). Long-lasting relationships with consumers can result

from personalisation, boosting consumer happiness and loyalty (Bhatia et al., 2019; Neff & Grau, 2019). Additionally, the use of data analytics can assist banks in identifying potential fraud and risk, enabling more successful risk management measures. (Bhatia et al., 2019).

Additionally, the use of data analytics can assist banks in identifying potential fraud and risk, enabling more successful risk management measures (Bhatia et al., 2019). Banks must constantly adapt and incorporate new technology to fulfil the increased demands of their consumers in the current digital era (Gupta et al., 2019). Failure to do so may result in lower customer satisfaction, ultimately resulting in consumers defecting to rival more innovative and digitally oriented businesses (Gupta et al., 2019; Neff & Grau, 2019).

2.4.3.6 Customer Retention

Customer retention is a crucial component of the banking sector, and consumers who want simple and convenient financial services place a high value on meaningful and individualized interactions (Kumar & Sharma, 2019). Customer experience is challenging to measure, but it is essential in predicting customer attrition, which may be costly for the bottom line of any financial institution (Kumar & Sharma, 2019). Therefore, maintaining consumers and fostering customer loyalty must develop strong customer relationships (Kumar & Sharma, 2019; Neff & Grau, 2019).

According to a global survey by Accenture Financial Services, customer service substantially impacts consumers' loyalty in the banking sector (Accenture, 2019). Financial institutions may lower churn rates and raise customer satisfaction by engaging with their clients effectively and maximising interactions that result in a more significant wallet share (Accenture, 2019; Vakratsas & Ambler, 2019). Consumer service has an impact on loyalty, according to 49% of respondents in a global study by Accenture Financial Services that polled close to 33,000 banking consumers from 18 areas (Accenture, 2019). According to the report, 75% of consumers stated they would switch banks for a more individualized experience with a bank that is aware of their needs and provides pertinent services (Accenture, 2019). Additionally, tailored interactions with clients can enhance client satisfaction even more, fostering client loyalty and retention (Wang & Huang, 2019). Banks can further boost client satisfaction and loyalty by segmenting their clientele and creating goods

and services that specifically address their demands (Wang & Huang, 2019; Chen & Chen, 2019).

Consumer segmentation is a powerful tactic for developing long-lasting client relationships (Wang & Huang, 2019). Customer segmentation allows banks to customize their services to match the particular needs of each customer category, creating more individualized experiences that cater to each customer's specific needs and preferences (Ghazali & Ismail, 2019). To enhance customer retention in the banking sector, banks must implement a customer-centric strategy to get to know and engage with clients effectively (Singh et al., 2019). Banks may raise client happiness and loyalty in this way, fostering long-lasting client relationships and growing wallet share (Singh et al., 2019; Chen & Chen, 2019). A more individualised and compelling customer experience is possible using data analytics and AI technology, which may help banks acquire insights into client behaviour and preferences (Chen & Chen, 2019; Liu et al., 2019). By putting these technologies in place, banks can lower turnover and keep their competitive edge in the financial services industry (Liu et al., 2019).

2.4.3 7 Outdated Mobile Experiences

Despite widespread usage, many financial institutions struggle to create a modern, user-friendly mobile experience (Liu & Yang, 2019). According to a 2020 study of banking clients, 58% of respondents thought their bank's mobile app was "just okay" or "not very good." (Power, 2020). It is becoming increasingly evident in the banking sector that mobile banking experiences must keep up with changing client expectations (Mittal et al., 2020). Customer turnover and lost revenue for financial institutions are possible outcomes of outdated mobile experiences that lower customer satisfaction (Kapoor et al., 2021). Financial institutions must maintain consumer happiness by ensuring their mobile banking experiences are current and offering various services, such as secure transactions and individualized help (Deloitte Banking and Capital Markets, 2023). By giving their consumers the convenience of sending and receiving money, banks that support mobile payments can further improve their clients' experience (Kapoor et al., 2021).

Decreased client satisfaction and eventual customer churn are two outcomes of outdated mobile experiences (Liu & Yang, 2019). Banks need to give the creation and upkeep of a cutting-edge, user-friendly mobile application a high priority to maintain their competitiveness (Power,

2020). Personalisation is an essential feature of the contemporary mobile banking experience. Banks can give customised discounts and suggestions to consumers through their mobile app by utilizing artificial intelligence and data analytics (Javelin Strategy & Research, 2021). Along with enhancing the consumer experience, this may also result in a rise in engagement and loyalty. Mobile banking applications must be updated often to accommodate clients' changing needs and preferences (Mittal et al., 2020). Banks can remain ahead of rivals and give their consumers the finest mobile banking experience by utilizing the newest technology and features (Deloitte Banking and Capital Markets, 2023). In addition, secure mobile banking applications are required to safeguard consumers' private financial data (Liu & Yang, 2019). This calls for continuous updates and upgrades to protect the application from the most recent threats and vulnerabilities (Deloitte Banking and Capital Markets, 2023).

2.4.3.8 Security Breaches

One of the most significant issues facing the banking sector is security, which is also a considerable worry for clients of banks and credit unions. Financial organisations must invest in the newest technologically advanced security measures, including:

- **Address Verification Service (AVS):** To identify dubious transactions and thwart fraud, AVS "verifies the billing address given by the card user against the cardholder's billing address on file with the issuing bank" (Mercan, Cebe, Akkaya & Zuluaga, 2022).
- **End-to-End Encryption (E2EE):** According to Isobe and Minematsu (2020), E2EE is a secure communication method that hides data from prying eyes as it is sent from one end system or device to another. Using cryptographic keys stored at each endpoint, E2EE encrypts and decrypts private messages (Singh, Chauhan, & Tewari, 2022). Banks and credit unions can use E2EE to protect mobile transactions and other online payments, ensuring that money is transported securely from one account to another or from a customer to a retailer (Blaise, Awodele & Yewande, 2021).
- **Authentication:**
- According to Devaraj and Modi (2022), biometric authentication is a security method that uses a person's distinct biological traits to confirm that they are who they say they

are. Biometric authentication systems compare biometric data captures to data confirmed as legitimate and stored in a database (Pujari, Patil, & Sutar, 2021). Examples include iris and fingerprint scanning, voice and facial recognition, and other standard biometric identification techniques (Chaimaa, Najib & Rachid, 2021). Since it is more secure and unlikely to be copied, biometric authentication can be used by banks in place of PINs (Sepehri-Rad, Sadjadi, & Sadi-Nezhad, 2019).

- Location-based authentication, or geolocation identification, is a technique for verifying a person's identity and truthfulness based on their outward appearance (Khan & Soroni, 2022). Banks can use location-based authentication with mobile banking to stop fraud by sending push notifications authorising transactions to consumers' mobile devices or triangulating the customer's location to determine whether they are in the exact location when the transaction occurs (Kumar, Singh & Singh, 2023).
- Out-of-band authentication (OOBA) is a technique for establishing authentication that uses two independent signals from two separate networks or channels (Mahinderjit, Ching, Manaf, 2020). Systems for authentication can stop unauthorized users who might only have access to one of these channels by employing two different media (Vassilev, Phipps, Lane, Mohamed, & Naciscionis, 2020). To access their account and verify their identity, consumers must enter the one-time security code that a bank generated using OOBA and sent to them through automated voice call, SMS text message, or email (Reese, Smith, Dutson, Armknecht, Cameron & Seamons, 2019).
- Risk-based authentication (RBA), also known as adaptive or step-up authentication, imposes varying degrees of stringency on authentication procedures depending on the likelihood that gaining access to a particular system will result in its penetration (Mordor Intelligence, 2023). RBA enables financial institutions like banks and credit unions to tailor their security protocols to the risk level involved in each customer transaction (Gavs Tech, 2022).

2.4.3.9 Antiquated Applications

Over 50% of financial services CIOs anticipate that more business will be conducted through digital channels and that digital efforts will produce more income and value (Gartner CIO Survey, 2017). Organisations will miss significant business evolution without a strong, futuristic, technical base (Baptista, Stein, Klein, Watson-Manheim & Lee, 2020). In other words, going digital is no longer just an excellent idea; staying alive is necessary.

2.4.3.10 Continuous Innovation

According to Rashid, Nurunnabi, Rahman, and Masud (2020), sustained company success requires insight, adaptability, strong client relationships, and ongoing innovation. Through contacts with consumers and ongoing organizational analysis, insights lead to innovation (Marinkovic, Rakocovic, & Tornjanski, 2022). Though insights alone are insufficient, financial institutions must be ready to change course when necessary to meet market demands while enhancing the client experience (Fan, 2023). In the drive for digital transformation, financial service organizations utilizing the most recent business technology, particularly around cloud applications, have a significant advantage (Demirel, Yabaş, Üçler, Ener & Zafer, 2021). The flexibility and scalability of cloud technology are its key strengths. System hardware is no longer a flexible constraint because of cloud computing (Business Tech, 2020).

2.4.3.11 Environmental, Social and Governance (ESG)

ESG (environmental, social, and governance) aspects should be considered when making credit and lending decisions (Brogi, Lagasio & Porretta, 2022). However, this longer-term strategy is not yet materially affecting sector credit quality (Roy, 2023). ESG is increasingly being accepted as a crucial factor in business decision-making worldwide, not just by banks but also by major corporate and financial institutions (GCR Rating, 2022).

2.5 AN OVERVIEW OF THE STATE OF THE BANKING INDUSTRY PERFORMANCE IN AFRICA

2.5.1 The African Market Performances

Africa is experiencing a historic acceleration that is bringing millions out of poverty, generating an emergent consumer class, and fueling growth in various economies (Jakovljevic, Liu, Cerda, Simonyan, Correia, Mariita, Kumara, Garcia, Krstic, Osabohien & Toan, 2021). Africa now

has the world's second-fastest-growing banking market (having combined retail and wholesale banking), with African banking revenue pools growing at an 11 per cent compound annual growth rate in constant 2017 exchange rates between 2012 and 2017 (McKinsey & Company, 2018). The African banking market will continue to be a growth leader in the coming years (Banking in Africa, 2020). Figure 8 depicts the scale of Africa's banking industry in comparison to other countries of the world.

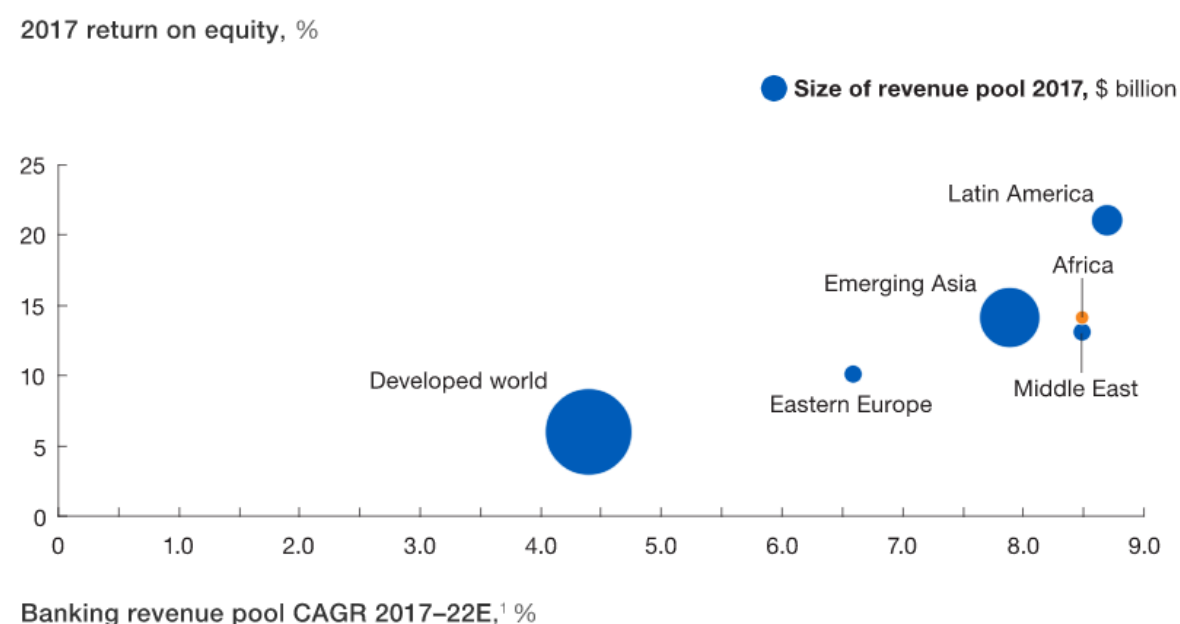


Figure 8: Africa's Banking Market

Source: Mckinsey Global Banking Pools Database

The banking industry is an integral component of any country's financial system, playing a vital role in mobilising savings and allocating credit to various economic agents (South African Reserve Bank, 2020). Globalisation, financial liberalisation, and technological improvements have all contributed to considerable changes in the African banking system in recent decades (Chipeta & Muthinja, 2018; South African Reserve Bank, 2020). According to Arise (2022), Africa's banking industry has expanded quickly in recent years, with North Africa's asset base significantly expanding, reaching \$497 billion, and Sub-Saharan Africa's assets rising to \$669 billion, a potential player in the emerging banking sector. More than 1.3 billion people, or more than 17% of the world's population, reside in Africa (Thefintechtimes, 2021). Seven hundred sixty-three commercial banks are in 54 African countries (Business Tech Africa, 2022). They are all distinctive and diverse, each having its own economic and cultural differences. Several

specialised banking industry players serve the region's large population. Figure 9 presents the top banks in Africa from 2013 – 2022.

Evolution of African top banks' capital, 2013-2022

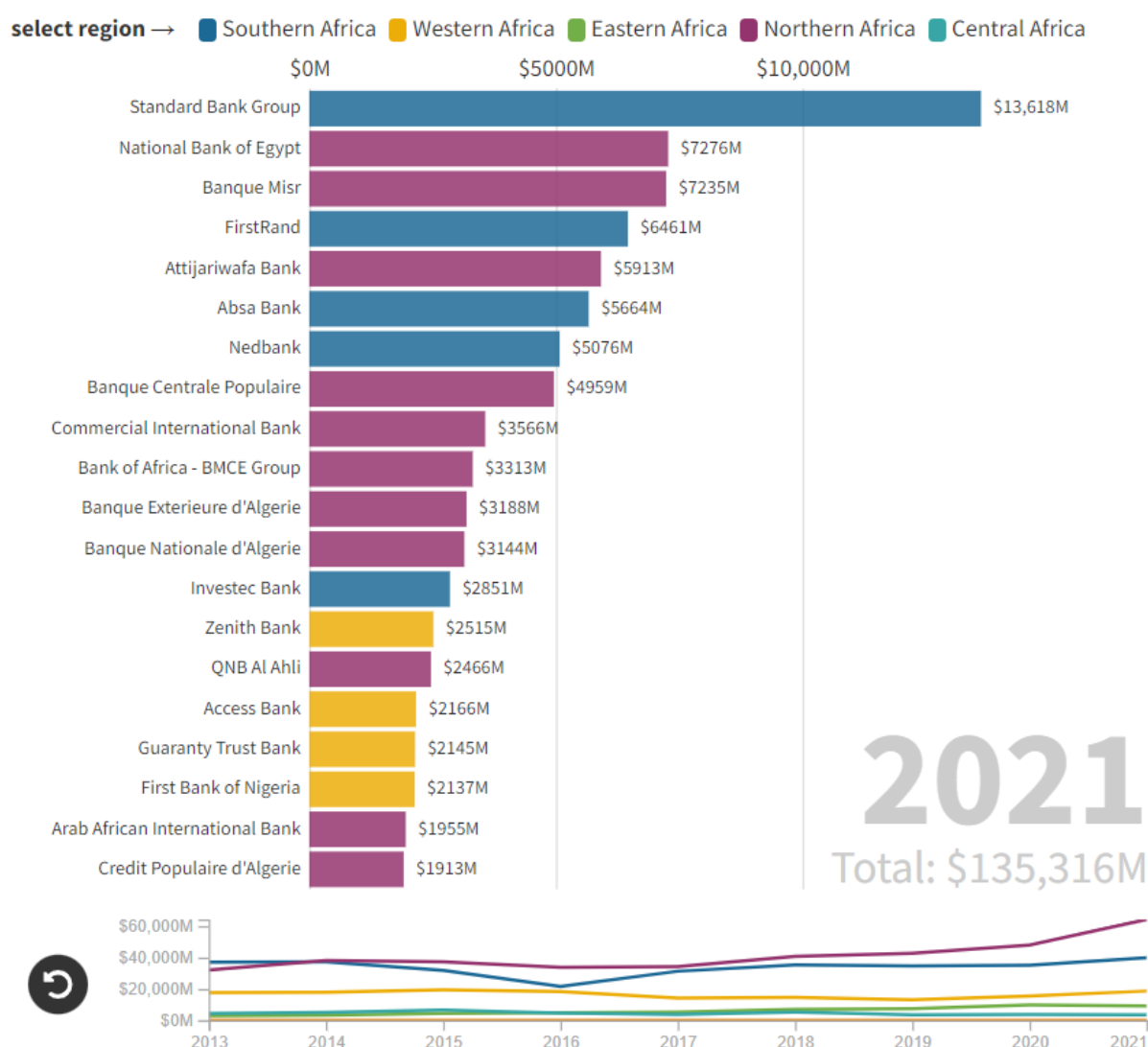


Figure 9: Top African Banks 2013-2022

Source: African Business (2022)

According to McKinsey & Company (2018), Africa's present banking business is worth around \$86 billion in revenues before risk costs. The predicted growth rate for Africa's banking revenue pools of 8.5 per cent per year between 2017 and 2022 will bring the continent's total banking revenues to \$129 billion (McKinsey & Company, 2018). The growth of the African banking industry has been uneven, with some countries growing better than others (Samour, Moyo, & Tursoy, 2022). Generally, the countries with the most developed financial systems, such as South Africa, Nigeria, and Egypt, have the most extensive banking sectors, with over

100 banks each (Lee, Olasehinde-Williams & Olanipekun, 2021; World Bank, 2023). These countries have also attracted significant foreign investment, which has aided in financing their banking sectors (World Bank, 2023).

Despite severe challenges, like macroeconomic instability, African banks are reportedly growing (S&P Global Market Intelligence, 2022). Their revenues have rebounded and are more significant than before the epidemic, largely thanks to consistent volume growth, higher interest rates, and stable risk costs (McKinsey, 2022). The banks on the continent are reportedly already putting strategies in place to promote open banking solutions, according to Techcentral (2022). In March 2021, the Bank of Ghana set out to foster the development of its fintech sector, primarily by facilitating open banking (The Fintechtimes, 2022). In South Africa, Nedbank and Investec are embracing open banking and making open APIs available (Business Tech, 2019).

2.5.2 The African Market Challenges

2.5.2.1 Infrastructure

One of the most serious issues confronting the African market is a lack of infrastructure, notably transportation, communication, and electricity (Deloitte, 2019). This can make transferring goods and people across the continent difficult and expensive, hindering access to information and technology (Banking in Africa, 2020). African countries face a yearly \$100 billion infrastructure funding gap (Foundethakis, 2022). Like other industries, the banking business relies mainly on infrastructure to function effectively, and its lack has negatively impacted the sector (Chen, Kumara & Sivakumar, 2021). The absence of dependable and effective payment systems is one of the significant infrastructure issues affecting the African banking sector (Siano, Raimi, Palazzo & Panait, 2020). Around 90% of transactions in Africa still involve cash, according to McKinsey (2022).

One of the most significant issues is a lack of access to technology infrastructure, such as reliable internet connectivity and power (Ajibade & Mutula, 2020). Many people in Africa still lack access to basic infrastructure, making digital banking services challenging (Pazarbasioglu, Mora, Uttamchandani, Natarajan, Feyen, & Saal, 2020). This restricts banks' potential consumer base and affects the usefulness of digital banking solutions (Soetan, Mogaji, & Nguyen, 2021).

2.5.2.2 Political Instability

Many African countries have a history of political unrest, which creates uncertainty and discourages foreign investment in the banking industry (IMF, 2020). Political instability also impacts the regulatory environment, making it difficult for banks to function appropriately (IMF, 2020). Political instability often leads to economic insecurity, which can cause liquidity issues for banks (Wang, Liu, Adebayo, Lobonț, & Claudia, 2021). Banks rely on a stable and developing economy to produce money, and political unrest can stifle economic growth. Furthermore, political unrest frequently leads to currency depreciation, eroding banks' capital bases and reducing lending capacity (Apaydin & Oban, 2022). Political instability also has the potential to deter foreign investors from making investments in the banking sector. Foreign investment is crucial for expanding and advancing the banking sector since it introduces fresh resources, expertise, and technological advancements (Acquah & Ibrahim, 2020). Political unrest, on the other hand, creates a risky and unclear climate that may discourage international investors (Azam, 2019).

Political instability can also impact the regulatory environment in which banks operate (Khan, Bose & Johns, 2020). Instability can lead to changes in government policies and regulations, which can cause uncertainty and make it difficult for banks to plan and invest long-term (Khan, Khan, Sayal, & Khan, 2022). Weak regulatory environments caused by political instability can also make it harder to safeguard the safety and soundness of banks, undermining public trust in the industry (Tchamyau, 2021).

2.5.2.3 Regulation and Over Regulation

Regulation significantly impacts the African banking industry since it is vital to preserve stability and ensure its safety and soundness (Tchamyau, 2021). The regulatory framework establishes the rules and principles banks must follow to operate safely and securely (Anarfo & Abor, 2020). Effective regulation can help the banking industry grow by ensuring that banks use it safely and soundly, protecting consumers, and encouraging financial stability. Tchamyau, 2021). Regulation can help establish a level playing field for all banks, eliminating unfair competition and increasing market efficiency (El-Chaarani, Abraham, & Skaf, 2022). According to Abor, Gyeke-Dako, Fiador, Agbloyor, Amidu, Mensah, Abor, Gyeke-Dako, Fiador, Agbloyor & Amidu (2019), excessive or poorly planned regulation can hurt the banking

sector. Overregulation and associated high compliance costs may negatively impact banks' profitability and capacity to extend credit to clients (Anthonyrajah & Malwandla, 2022).

Additionally, excessive, prescriptive regulation can stifle innovation and make it difficult for banks to adjust to shifting market conditions (IA, Miglionico, 2019). In Africa, banking sector regulation differs significantly between nations (Ozili, 2021). Some governments have established solid regulatory frameworks that have helped their banking industries expand and flourish (Lashitew, van Tulder, & Liasse, 2019). This has, in turn, caused a lack of harmonisation of regulatory frameworks across nations (Omar & Yusoff, 2019). This lack of harmonisation can make it difficult for banks to operate across borders and lead to regulatory arbitrage, in which banks seek out states with less strict regulations (Oduor & Kebba, 2019).

2.6 THE STATE OF THE SOUTH AFRICAN INDUSTRY

2.6.1 The Performance of the Banking Industry

In 2020 the banking industry reported a combined headline earnings of R86.8 billion (PwC Major Bank Analysis Report, 2021). The combined return on equity (ROE) was 15.9%, the net interest margin was 408 basis points, the credit loss ratio was 74 basis points, and the cost-to-income ratio was 55.8% (PwC Major Bank Analysis Report, 2021). According to the PwC Major Bank Analysis Report (2021), cited in Engineering News (2022), the leading banks' results for the studied period essentially point to solid credit performance. The study also reveals that strong franchise momentum and increased customer transactional activity produced resilient pre-provision operational profit growth of 6.2% yearly (PwC Major Bank Analysis Report, 2021). Notably, increasing non-interest income is derived from revenue streams delivering broader financial services, such as insurance activities and asset and investment management (Business Tech 2022).

2.6.2 Growth Factors of the Industry

South African banks have adopted various features and functionalities for their financial services. The South African Reserve Bank's new Rapid Payments Program will be live soon (RPP) (Bankserv 2019). Business Tech (2022) claims that the eagerly anticipated modernization of the country's inter-banking payment system "will increase financial inclusion and make it significantly easier, and cheaper, for consumers to pay businesses and fellow

consumers while boosting e-commerce sales." As a practical alternative to cash payments, RPP's primary objective is to make digital payments more accessible for everyone in South Africa (Bankserv 2019). For the benefit of all South Africans, RPP will create a cutting-edge, user-friendly, and adequate payment platform that can handle lower-value transactions at a reasonable price (South African Reserve Bank, 2022).

2.6.3 Challenges of the banking industry in South Africa

2.6.3.1 The unbanked

The variety of financial services offered in South Africa includes both well-known options like bank accounts and credit cards as well as lesser-known ones like hire purchase contracts and loans from "mahonias" (loan sharks) (The Conversation, 2020). According to Business Elites Africa (2021), the Oxford Business School (2016) estimated that 23.5% of South Africans lack bank accounts and that R12 billion—\$1.04 billion—in cash is considered outside banks. According to the World Bank's compilation of data called The Global Findex Database 2021 Financial Inclusion, Digital Payments, and Resilience in the Age of Covid-19, the proportion of persons over the age of 15 who have accounts has increased significantly, from 54% in 2011 to 84% in 2021. TymeBank today has four million consumers, and Discovery Bank has one million accounts owned by more than 450,000 consumers, demonstrating their significant influence (BusinessInsider, 2022). While the number above does not reveal the Millennials and Gen Z's proportionate adoption, research shows that these two cohorts are predominantly adopters of digital-only banking products (Rodrigues, Rodrigues & Oliveira, 2022).

2.6.4 The population of the study in South Africa

According to a study conducted by the Global Economy (2021), the percentage of persons over 14 who have bank accounts in 2021 was approximately 84.11%. New bank launches like TymeBank, Discovery Bank, and Bank Zero have increased this uptake. TymeBank has four million consumers, while Discovery Bank has one million accounts with over 450,000 members, proving their tremendous influence (News24, 2021). Bank Zero has not yet made any financial disclosures (Business Insider 2021). According to the SARB (2020), the five largest banks in South Africa accounted for 89.4% of total banking assets as of March 31, 2020 (March 2019: 90.5%). Local branches of foreign banks accounted for 7.0% of the banking sector's assets at the end of March 2020 (up from 5.8% in March 2019), while other banks

accounted for 3.6% (Business Insider 2020). Figure 7 illustrates the total assets market share for the South African banks.

SA TOTAL ASSETS MARKET SHARE (%)

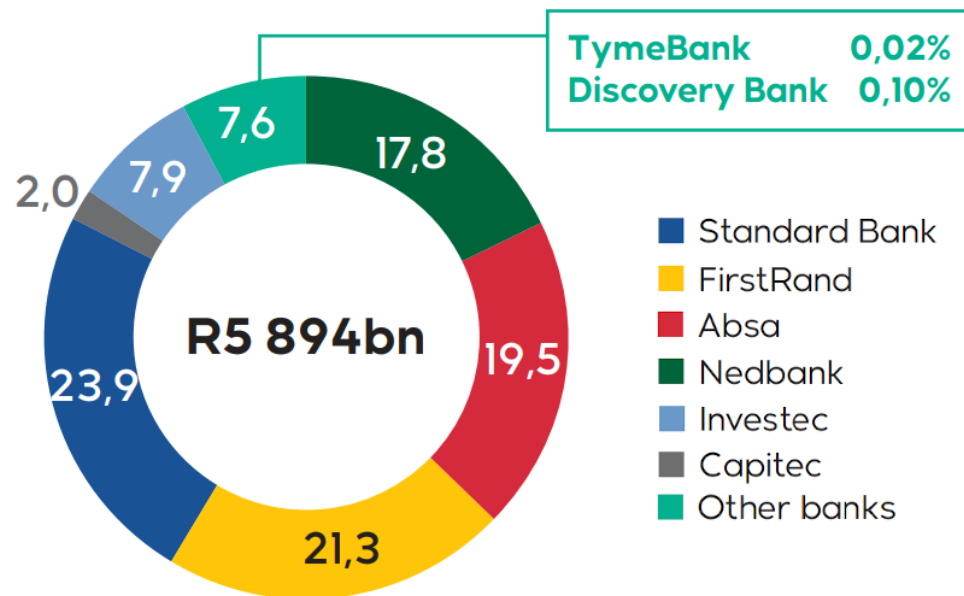


Figure 10: SA Banks Total Assets Market Share

Source: Business Tech (2020)

2.7 TRENDS IN THE BANKING INDUSTRY

2.7.1 Trends in the Banking Industry

The global financial landscape is undergoing tremendous changes. The shift is due to the increasing rate of innovation, changes in banking customer behaviour, impending financial services deregulation, and worldwide competition (Ali & Oudat, 2020). The adoption of mobile technology as a competitive innovation and first-mover advantage by several businesses, including banks, has been astronomical (Zhang, Lu, & Kizildag, 2018). The following trends will be discussed further in the study:

2.7.1.1 Trends Driven by Technology and Innovation

The banking industry is shifting from physical branches to technology, data, and highly skilled human resources (Vives, 2019). Banks face rising competition from more digital intermediaries in their core activities, such as payment and advising services (Ali & Oudat, 2020). The recent development and rapid growth of new financial services by financial technology (Fintech) firms have pushed banking institutions to embrace operational innovation to maintain a sustainable competitive edge (Zhang, Tsai & Wang, 2019).

2.7.2 Trends Facilitated by Banking Consumer

2.7.2.1 Embedded Finance

Today's service providers see consumer satisfaction as the key to establishing a long-term competitive advantage (Yadollahi, Kazemi, & Ranjbarian, 2019). Regulatory restrictions, technological improvements, and consumer desire for cutting-edge and flawless digital experiences drive the creation of a new era of financial technology known as embedded finance (Shrier & Pentland, 2022). From no-click payments on the Uber app to point-of-sale loans from buy-now-pay-later (BNPL) providers like Affirm linked into mobile shopping apps, instances of existing embedded finance continue to spread throughout the sector (Finextra, 2022). By reducing barriers, embedded finance improves the user experience and increases consumer brand loyalty (Finextra, 2022). Business Insider (2021) states that embedded finance will offer a \$7.2 trillion business opportunity by 2030. Because Millennials and Gen Z value convenience, obtaining bank loans should be as simple as using other convenient apps (Kaabachi, Ben Mrad, & Barreto, 2022; Ncube, 2020). Similarly, to how embedded finance is changing how we buy things and services, it may also transform how we bank and even how Millennials and Gen Z see banks (Nocera, 2022; Waliszewski, 2023).

2.7.2.2 Digital Ubiquity

The increased use of digital technologies has given consumers additional power (Rayna & Striukova, 2021). In-store shoppers use their gadgets to compare pricing, read product reviews in online forums, and share their shopping experiences on social media (Finextra, 2022). Consumers can now choose the most convenient channel for them at the time, but their digital devices always tell them (Ubiquity, 2020). Millennials and Gen Z will do most jobs that can be completed digitally on a mobile device (Verma, Tripathi, & Singh, 2021; Elayan, 2022).

When done correctly, digital ubiquity leads to a remarkable shopping journey for each consumer (Rodrigues & Coelho, 2021). Because of contextual hyper-personalisation, a brand may be present when a consumer is in need (Kent, Kuksa & Fisher, 2022; Waupsh, 2022).

2.7.2 Challenges Faced by the Banking Industry

2.7.2.1 Risk management

Risk management has been more prominent in banks since the global financial crisis, constantly emphasising how risks are recognized, measured, reported, and managed (Leo, Sharma, & Maddulety, 2019). According to Ekinici and Poyraz (2019), banks face risks because of their dynamic structure and the complex nature of the economic environment in which they operate. Risk management in the banking industry is becoming more critical as the economy becomes more volatile (Ali & Oudat, 2020). The growth of risk categories, changing consumer expectations, and the breadth and complexity of regulation, according to Leo et al. (2019), are expected to drive change in risk management. Risk management is critical to the success or failure of any financial firm (Ali & Oudat, 2020).

2.7.2.2 Financial Technologies (FinTech)

Market changes have mostly been made possible by the Internet of Things (IoT) (Sangwan, Prakash, & Singh, 2019). Fintech is a game-changing invention (Hendershott, Zhang, Zhao, & Zheng, 2021; Regmi, Rai & Khanal, 2021). Fintech combines money and technology (Zavolokina, Dolata, & Schwabe, 2017; Huang, 2020). According to Gai, Qiu, and Sun (2018), "FinTech" has gained prominence regarding cutting-edge technologies financial service providers use. Payment banks have already strengthened their competition with traditional banks significantly (Boustani, 2020; Melnyk, M., Kuchkin, & Blyznyukov, 2022). Google and Amazon have noted and entered the fray (Poornima & Chitra, 2020). According to Accenture (2018), new entrants have invested \$100 billion in FinTech since 2010, which may soon overtake traditional banking. Furthermore, using electronic payment methods by Fintech could render credit and debit cards obsolete (Poornima & Chitra, 2020).

According to Anagnostopoulos (2018), fintech has enhanced client banking experiences since the technological ecosystem can investigate big data-driven consumer behaviour analytics and give customised solutions. With falling margins, declining profitability, eroding trust, and the

threat of losing market share, fintech will drive lax banks to adjust their business models and cost structures and adopt and deploy client-centred services (Sangwan et al., 2019). According to Anagnostopoulos (2018), this disruption is also related to rules and materially relevant to prudential regulators. It is both a boon and a curse for the regulator's goals of promoting financial stability and protecting consumers (Rupeika-Apoga & Thalassinou, 2020). Consumers and processes are entirely data-driven and move quickly, making it possible for the pace of service and product novelty to render legislation regarding such products/services obsolete even before such regulations are developed (Anagnostopoulos, 2018).

2.7.2.3 Telecommunication companies

Mobile phones have opened up a world of financial growth opportunities, and it is projected that they will soon become a standard instrument for various economic operations (Iman, 2018). According to the Engineering News (2021) report, South Africa's significant telecommunications firms are stepping up their Fintech strategies and placing substantial bets on the continent's untapped digital economy potential to boost declining traditional revenues in the ever-changing digital era. According to Pymnts (2022), the Central Bank of Nigeria (CBN) has permitted South African telecom MTN to operate as Momo Payment Service Bank Limited. M-Pesa is a uniquely African fintech solution that combines telecommunication and financial developments (Investec, 2020). M-Pesa is a joint venture between Vodafone and Kenya's Safaricom that operates in seven African countries and beyond. M-Pesa (from the Swahili word for money) is a mobile banking service available to account holders (Investec, 2020).

2.7.3 Opportunities Faced by the Banking Industry

2.7.3.1 Blockchain Technology and Banking

Blockchain is the future technology for interbank transfers, international payments, cryptocurrency, record keeping, know-your-customer (KYC), loan syndication, and more transparency (Ynag, Zhao, Huang, & Zheng, 2022). According to FinTech Weekly (2020), banks should try to minimize expenses by embracing technology such as blockchain, which allows enterprises to make transactions with fewer constraints and at a lower cost by using "stablecoins," which stand in for a specific fiat currency. One of the key reasons driving

significant cost savings is the deployment of blockchain technology (PwC FinTech study, 2020).

Blockchain has the potential to completely transform several industries, including finance since it is a decentralised and secure ledger technology (Javaid, Haleem, Singh, Suman & Khan, 2022). It may have a variety of effects on South African mobile banking. First off, the transparency and immutability of blockchain technology may improve the security and integrity of financial transactions made via mobile banking apps, allaying worries about fraud and data breaches (Javaid et al., 2022). Investigating how blockchain technology can be incorporated into mobile banking appears to be a viable way to guarantee security and confidence in online financial transactions (Albayati, Kim & Rho, 2020).

Furthermore, taking into account how blockchain promotes financial inclusion can be beneficial in studying the continuous use of mobile banking apps among Gen Z and Millennials in South Africa (Dewasiri, Karunarathne, Menon, Jayarathne & Rathnasiri, 2023; Jain & Raman, 2023). Blockchain has the power to lower transaction costs, simplify cross-border transactions, and give unbanked or underbanked people access to financial services (Norta, Leiding & Lane, 2019). An understanding of how younger generations in South Africa behave and what appeals to them in terms of blockchain technology could help determine whether or not blockchain-based financial solutions will be adopted and accepted in the future (Jain & Raman, 2023).

The point of confluence of technology between these two fields of study emphasises how crucial it is to shape the financial ecosystems of the future (Chen, Chen & Ou, 2023). Examining how blockchain, with its transparent and decentralised features, fits in with the expectations and preferences of South African millennials and Gen Z will be beneficial for research examining the continuous use of mobile banking apps (Jain & Raman, 2023). By utilising blockchain technology, this research may pave the way for innovative approaches to enhancing mobile banking services' security, efficacy, and usability.

2.7.3.2 Non-fungible tokens (NFTs)

Non-fungible tokens (NFTs) are digital assets kept on blockchain technology that serves as proof of ownership to the underlying item they reference, which can be physical (for example, using NFTs to confirm the authenticity of Nike sneakers) or digital (for example, photographs,

music, movies, virtual, and in-game items) (Jordanoska, 2021). According to FISGlobal (2021), for banks to thrive with NFTs, much more than technology is required. Adopting new ways of thinking about and approaching software development, deployment, and management is vital. According to Insider Intelligence (2022), NFTs could be used for the following banking applications:

- NFTs enable businesses to register and transfer digital assets on the blockchain, enabling data owners to retain information while guarding against loss or corruption (Raman & Raj, 2021). This solution might make it easier for banks and FIs to manage the difficulties in processing and safeguarding sensitive data (Alam, Hasan & Ahmad, 2023). There are several owners of royalties at times, and it is not always clear who should receive compensation, with NFTs, it is apparent who owns what (Lee, 2023).
- NFTs may also be able to help banks attract new clients who are sceptical about cryptocurrencies and put off by the intricacy of blockchain technology (Babu, Bason, Porreca, Petratos & Akter, 2024). Anyone may benefit from selling collectables; banks and fintechs can profit from trading NFTs (Wilson, Karg & Ghaderi, 2022).

NFTs provide a means of comprehending changing consumer preferences and behaviours about digital assets and transactions within the framework of research on the use of mobile banking apps (Behl, Pereira, Nigam, Wamba & Sindhvani, 2023). The possible integration of NFTs with mobile banking apps is one facet of this intersection. It might be possible to gain insight into the viability and desirability of integrating such digital assets into financial activities by investigating how South African millennials and Gen Z see and use NFTs (Turi, 2023). With their capacity to authenticate ownership and uniqueness, NFTs may bring a fresh perspective to the world of digital assets in mobile banking (Beckman, 2021).

Emerging trends in digital wealth management and investing techniques may become clearer with an understanding of how these distinctive digital assets are valued, purchased, and sold within the Millennial and Gen Z groups (Xie, Muralidharan & Edwards, 2023). In the context of mobile banking, this investigation may reveal how NFTs affect financial decision-making and diversify digital portfolios. Examining the intersection with NFTs can be beneficial for the research on ongoing mobile banking app usage among South African Gen Z and millennials. By gaining significant insights for financial institutions seeking to match their services with the preferences and expectations of younger generations, this exploration may help to advance our understanding of the changing digital economy.

2.8 CONCLUSION

With a crucial function in the financial systems of both national and international economies, the banking sector is a vital part of every economy. This chapter examined the banking industry in-depth, beginning with its definition and place in international and domestic contexts. It then identified the industry's global and domestic issues and trends. Domestically, the banking industry is a crucial engine of economic growth. Banks provide the financing required for businesses to expand and generate jobs. They also provide the necessary financial services for individuals to save, borrow, and invest. However, the industry is also subject to regulatory oversight to ensure it operates safely and soundly. The banking industry is also experiencing geopolitical threats on a worldwide scale. Trade tensions between the United States and China, Brexit, and the Middle East conflict are all causing instability in the industry. Banks are diversifying their activities and minimising their exposure to riskier locations in response. Another issue confronting the business is the growing competition from fintech firms. Fintech firms use technology to deliver financial services that banks previously provided. This has shifted the banking industry's competitive landscape, and banks are responding by investing in their technologies. The chapter that follows moves considers the literature that underpins the study.

CHAPTER 3: LITERATURE REVIEW

3.1 INTRODUCTION

The study considered the banking sector from a variety of perspectives in the second chapter, including studies of local, national, and global market concerns. Trends and performance statistics were also taken into account. The discussion throughout the study included references to banking and financial services. The five theories that were used to evaluate the sustained usage of mobile banking apps by Millennials and Generation Z are addressed in this chapter. The Expectation Confirmation Theory of Information System Continuity (ECT-IS), the Unified Theory of Acceptance and Use of Technology (UTAUT), the Task Technology Fit (TTF), the Social Response Theory (SRT), and the Computer As Social Actors (CASA) are the five theories applied by the study.

This chapter is structured as follows. Section 3.2 provides an outline of the theories that were applied to the research. The overview is followed by Section 3.3, which examines the constructs used to support the investigation and analyses the empirical literature of the study. Section 3.4 will evaluate the relationships to formulate hypotheses and build conceptual models. The chapter will conclude with a detailed interpretation of the literature review within the framework of this study.

3.2 THEORETICAL GROUNDING

This study's five underlying theories are discussed—the theories of the UTAUT, ECT-IS, the TTF, the SRT, and the CASA. The hypotheses are utilised as a foundation to explain the elements that affect Millennials and Gen Z's continuous usage of mobile banking, which was the study's primary objective. The study will discuss the individual theories in the sections that follow.

3.2.1 Discussion of the UTAUT Theory

3.2.1.1 An Overview of the historical background of the UTAUT

The Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), and the Theory of Planned Behaviour (TPB) were all foundational theories upon which Venkatesh et

al. 2003) developed their initial UTAUT model. UTAUT combined the main ideas from these models into a single framework to give researchers a more thorough understanding of how people utilise technology (Venkatesh et al., 2003). A thorough evaluation of the literature was used to develop the model, and the results showed that several external factors, such as enabling conditions, social norms, and individual norms, influence how people utilise technology (Venkatesh et al., 2003). Since its debut, UTAUT has undergone numerous adjustments and extensions to increase its generalisability and predictive potential. For instance, Venkatesh and Bala (2008) expanded the model to account for individual variations such as gender and age. Venkatesh et al. (2012) introduced hedonic motivation as a crucial element affecting user behaviour concerning technology (Venkatesh & Bala, 2008; Venkatesh et al., 2012).

The model has been extensively utilised in Information Systems (IS) research to forecast user adoption and usage of numerous technologies, including mobile apps, social media, and electronic medical records, among others (Venkatesh et al., 2003; Venkatesh & Bala, 2008; Venkatesh et al., 2012). The UTAUT's generalisability and predictive effectiveness in many contexts and demographics have been confirmed by numerous research. UTAUT could predict user acceptance of e-learning systems in China (Zhu & Dai, 2019). The model was validated in the context of Taiwan's adoption of mobile payments (Hsiao & Chen, 2018) study.

In IS research, UTAUT has been a significant model that has helped researchers gain a fuller knowledge of the variables that affect users' acceptance of and use of technology (Zhu & Dai, 2019; Hsiao & Chen, 2018). The model has undergone several adjustments and additions over the years, which have increased its generalisability and predictive power. For a very long time, UTAUT will probably be employed in IS research as it is still a helpful and pertinent model for analyzing user behaviour toward technology (Venkatesh et al., 2003).

3.2.1.2 The Evolution of the UTAUT over Time

Four important factors known as, performance expectancy, effort expectancy, social influence, and facilitating conditions were highlighted by Venkatesh et al. (2003) in their initial UTAUT model as having an impact on user adoption and usage of technology (Purwanto & Loisa 2020). This model was built upon several earlier models. Several technologies and contexts were examined to validate the model, and it was discovered to have a powerful capacity for

explanation (Purwanto & Loisa, 2020; Jadil, Rana & Dwivedi, 2021; Momani, 2020). Scholars have proposed several changes and modifications to the original UTAUT model.

Hedonic motivation has been noted by Venkatesh et al. (2012) as a notable development that affects user adoption and technology use. This update took into account the fact that people usually adopt new technology for its convenience, enjoyment, and fulfilment.

Adding trust as a factor affecting user adoption and use of technology was another addition to the UTAUT (Ahmed, Bogale, Tilahun, Kalayou, Klein, Mengiste & Endehabtu, 2020). Trust is crucial when users reveal sensitive personal information or perform sensitive transactions online, like in the healthcare or financial services industries (Wagner, Strulak-Wójcikiewicz & Landowska, 2019). Numerous extensions to the UTAUT have also been suggested in addition to changes (Momani, 2020). One such modification is the UTAUT2 model, which (Venkatesh et al., 2008) includes extra elements, including facilitating conditions, self-efficacy, and anxiety. Mobile payments are one example of a technology utilised to explain user acceptance and use using the UTAUT2 paradigm (Hsiao & Chen, 2018). UTAUT can further be extended by integrating the model with other theoretical frameworks, such as the Innovation Diffusion Theory and the Information Systems Success Model (Zhu & Dai, 2019).

This integration has allowed for a deeper understanding of user acceptance and uptake of new technology. Over time, UTAUT has changed to consider more variables and increase its capacity for explanation. The model has been altered and expanded to account for developments in user behaviour research and shifts in the technological environment. According to Alalwan, Dwivedi, and Rana (2019), these modifications have made the UTAUT helpful in analysing and forecasting consumer acceptability and uptake of new technologies.

3.2.1.3. The fundamental principles constructs of UTAUT

UTAUT was initially developed from the TAM model in 2003 and consists of four elements that impact behavioural intentions to utilise technology: performance expectancy, effort expectancy, social influence, and facilitating factors (Rachmawati, Bukhori, Majidah & Hidayatullah, 2020). To illustrate the effects of South African Millennials and Gen Z's mobile banking apps continued usage, the study used performance expectancy.

3.2.1.2.1 Performance Expectancy

Performance expectancy is the extent to which a consumer believes that utilising technology will help them perform better and finish their tasks (Almutairi et al., 2022). According to Jovana and Aleksandra (2019), mobile banking users concur that it makes banking easier. Expectations regarding the performance of new technology impact consumers' willingness to accept and employ it (Almutairi et al., 2022).

3.2.1.2.2 Effort Expectancy

According to Al-Fahim, Abdulgafor, and Qaid (2021), effort expectancy assesses a system's user simplicity. Users are more likely to execute financial transactions when a service is more convenient (Almutairi et al. 2012). It can thus be inferred that a user-friendly application attracts users by enabling frequent use.

3.2.1.2.3 Social Influence

Social influence is defined by Raza, Qazi, Khan, and Salam (2021) as the extent to which an individual perceives that others need to think to put in place a new system. The social effect of an individual is the extent to which they think that others ought to embrace the new approach (Al-Mamary, 2022). In other words, it refers to the social pressure applied to a person due to other people or groups' ideologies. One could conclude that consumers are more willing to accept goods or services if they think well-known individuals and groups use them.

3.2.1.2.4 Facilitating Conditions

The extent to which one thinks the system's present technological and organisational architecture enables its use is known as the facilitating conditions (Raza et al., 2021). According to Yoon-joo and Park (2021) facilitating conditions are people's perceptions about the accessibility of technology and organisational resources (i.e., opportunity, expertise, and resources) that can remove barriers to system usage. Enabling conditions are crucial for app service usage and benefit user enjoyment, (Yoon-joo & Park, 2021; Khan et al. (2020).

3.2.1.4 Criticisms against the UTAUT

UTAUT has drawn a lot of interest in studying information systems and is frequently employed. Despite being widely accepted, the idea has been criticised for several flaws. This section will examine some of the UTAUT theory's detractors. According to Mikyan and Papagiannidis (2021), the UTAUT theory has been critiqued for being a generic paradigm that

ignores differences in user behaviour across settings and cultures. According to other academics, the UTAUT model might not accurately reflect the complexity of user behaviour in particular circumstances (Cenfetelli & Wolverton, 2020).

UTAUT has also been criticised for failing to consider emotions when explaining why people accept new technologies Mishra et al. (2019). Users' acceptance of new technology is influenced by their emotions (Nistor et al., 2019). Additionally, the UTAUT theory does not consider how users' views toward technology may affect their intention to use it (Mishra et al. (2019). The model has also been criticised for its disproportionate attention to individual-level variables and for disregarding the larger institutional and societal context of technology adoption (Koh & Kim, 2019). This criticism is based on the claim that organisational and social levels and individual-level factors also impact how people adopt new technology (Chen et al., 2019). Additionally, UTAUT has come under fire for being overly simplistic and for adopting a narrow point of view that solely focuses on each adopter's beliefs, perceptions, and intended uses (Shachak, Kuziemy, & Petersen, 2019).

UTAUT is frequently criticised for failing to account for anticipated changes in users' behaviour during the pre-and post-adoption stages in accepting new technologies (Bölen, 2020; McLean & Osei-Frimpong, 2019). The theory has failed to consider how government laws, regulations, and other external variables may affect how people adopt new technologies (Teo & Srivastava, 2019). This restriction is especially pertinent in the context of emerging technologies like blockchain and artificial intelligence that intricate legal frameworks might govern. Although the UTAUT theory has several drawbacks, it also has some advantages. One advantage is its capacity to explain a broad range of technology adoption behaviours across many situations (Venkatesh et al., 2016).

The UTAUT theory has drawn both support and opposition in studying information systems. The theory has drawbacks, including a narrow focus on individual-level elements and a disregard for external factors. Still, it has certain advantages, such as the capacity to explain a wide range of technology adoption behaviours in many circumstances. To strengthen the UTAUT theory's explanatory power, future research should address these critiques and make additional improvements.

3.2.1.5 Findings on studies that have used UTAUT

Recent research has examined aspects affecting user acceptance and adoption of new UTAUT technologies. Findings from studies that have employed UTAUT during the past ten years will be covered in this section. With the application of UTAUT, Lee and Kwon (2017) investigated the uptake of mobile payment services in Korea. Performance expectations, effort expectations, and social influence were found to have a significant consequence on consumers' propensity to use mobile payments. In an alternative investigation, Alalwan et al. (2017) used UTAUT to examine the factors affecting Jordanian consumers' propensity to utilize mobile banking. The study found that performance expectancy, effort expectancy, social influence, and enabling variables all had a significant impact on a user's readiness to adopt mobile banking. In a study by Sharma and Yetton (2019), the adoption of telehealth services in Australia was investigated using UTAUT. The study found that performance expectancy, effort expectancy, social impact, and enabling variables strongly predicted users' intention to adopt telehealth services. Al-Hujran et al. (2019) used UTAUT in a different study to look at the variables affecting Jordan's adoption of government electronic services. According to the study, user expectations for performance, effort, social impact, and facilitating factors had a significant impact on users' motivation to use electronic government services.

Lai et al. (2019) examined the factors influencing Taiwanese university students' adoption of mobile learning with UTAUT. The study found that user intention to adopt mobile learning was highly influenced by performance expectancy, effort expectancy, social influence, and facilitating factors. Chen and Yang (2019) employed UTAUT in similar research to investigate the variables impacting the adoption of mobile learning in Chinese higher education. User expectations for performance, effort, social impact, and facilitating variables were found to have a significant impact on users' desire to adopt mobile learning. UTAUT was used in a study by Hassan and Sajjad (2019) to look at the uptake of mobile banking in Pakistan. The study found that social influence, effort expectations, performance expectations, and enabling factors were major predictors of a consumer's propensity to embrace mobile banking.

The utilisation of UTAUT examined the variables influencing Ghana's adoption of mobile health apps (Tabi et al., 2019). The study discovered that users' inclination to use mobile health apps was significantly influenced by expectations for performance, effort, social impact, and enabling characteristics. Karim et al. (2020), leveraged UTAUT in examining the adoption of

mobile banking in Bangladesh. The study discovered that user intention to use electronic health records was highly influenced by performance expectation, effort expectancy, social effect, and enabling characteristics. These studies demonstrate how to apply and use UTAUT to investigate new technology adoption and user acceptance across a range of settings and cultural contexts. The findings show that performance expectancy, effort expectancy, social influence, and enabling factors have a significant impact on consumer adoption and uptake of new technology, regardless of the particular situation.

3.2.1.6 The Rationale for Using the UTAUT and its Relevance to the Study

UTAUT has been widely used in studies looking at how users accept and use technology, especially mobile banking apps (Al-Saedi, Al-Emran, Ramayah & Abusham, 2020). The UTAUT model is a useful instrument for understanding variables impacting the uptake and continuous utilisation of mobile banking apps, especially with Millennials and Gen Z. One of the primary justifications for employing the UTAUT model is its capacity to represent the complexity of user behaviour and the diversity of factors that affect technology adoption and usage. Venkatesh et al. (2003) have demonstrated that the four fundamental characteristics of the UTAUT model performance expectancy, effort expectancy, social influence, and facilitating conditions—have an enormous effect on how consumers act concerning technology adoption.

Numerous studies have examined the factors influencing Millennials and Gen Z's continuous use of mobile banking applications using the UTAUT model. For example, Javed and Yu (2019) investigated the factors influencing Pakistan's Gen Z population's adoption and sustained usage of mobile banking applications using the UTAUT model. According to the study, performance expectations, effort expectations, and social influence all had a significant impact on the uptake and ongoing usage of mobile banking applications. Alharbi et al. (2019) applied the UTAUT model to explore the variables affecting Saudi Arabian Millennials' propensity to continue consuming mobile banking applications. The study discovered that the sustained use of mobile banking applications was significantly influenced by social influence, performance expectations, effort expectations, and enabling factors. Other research has also employed the UTAUT model to look at the factors influencing Millennials and Gen Z's adoption and usage of mobile banking. These studies include those carried out in Malaysia (Ting et al., 2019), China (Gong et al., 2019), and India (Nath & Boroowa, 2019). This study

has shown that the UTAUT theory provides a useful framework for understanding the factors influencing user behaviour concerning the acceptance and continued use of mobile banking.

Using the UTAUT Theory, researchers Chitakala and Phiri (2022) looked into how e-tax services were adopted in Zambia using the ZRA online system. According to Chitakala and Phiri's (2022) discoveries, there is a positive correlation of statistical significance between the actual use and the expected amount of effort, social impact, and behavioural objectives.

In recent years, mobile banking applications have grown in popularity, with Millennials and Gen Z being the primary users of these apps. Considering the variables underlying this behaviour is essential because sustained use of these apps is not guaranteed. Utilising an artefact, which enables users to assess the app's technological impact, is one method of determining the effects of a mobile app's ongoing use. The UTAUT paradigm has been used extensively in research on consumers' adoption and usage of technology, particularly mobile banking apps. The four fundamental characteristics that form the foundation of UTAUT are performance expectancy, effort expectancy, social influence, and facilitating conditions. These constructs have significantly impacted user behaviour concerning technology adoption (Venkatesh et al., 2003). The UTAUT model was chosen for its in-depth and all-encompassing character in researching factors that affect South African Millennials and Gen Z's continuous usage of mobile banking apps. It has been discovered that the UTAUT model has greater explanatory power than earlier theories employed to gauge technology acceptability. It is, therefore, a suitable model to examine the variables influencing Millennials and Gen Z's continuous use of mobile banking apps in South Africa. The UTAUT model, according to Khan, Hameed, and Khan (2017), is frequently used since it is exhaustive and comprehensive. The literature on various technologies has provided proof of its versatility and comprehensiveness, making it a good model for examining mobile banking app utilisation.

3.2.2 Discussion of the ECT-IS

3.2.2.1 An Overview of the historical background of the ECT-IS

Information systems research is becoming more and more interested in people's post-adoption technological behaviours, particularly how they continue to use technology (Ortiz de Guinea & Marcus, 2009). A new technology's long-term survival is largely dependent on users' ongoing use patterns as opposed to their initial choices about acceptance (Venkatesh, Thong,

Chan, Hu & Brown, 2011). This is because a technology's anticipated benefits are only realised when the people who stand to gain from it use it over an extended period (Bhattacharjee & Barfar, 2011). However, in contrast to theories that focus on technology acceptance like the Innovation Diffusion Theory, Social Cognitive Theory, Theory of Planned Behaviour, and Theory of Reason Action (Venkatesh, Morris, and others), there aren't many that primarily focus on continued use (Bhattacharjee & Lin, 2015). Therefore, researchers began developing a new theoretical framework to explain IS continuance (Bhattacharjee, 2001; Lee et al., 2003).

Among the fundamental theories utilised to describe an individual's continuing technology use is the dominating lens that is employed to explain individuals' continued use behaviour (Bhattacharjee & Barfar, 2011). ECT clarifies the technology usage process by exhibiting how an individual's initial expectations of technology are changed through confirmation into satisfaction with the technology, subsequently leading to continued use behaviour (Lankton, McKnight, Wright & Thatcher, 2016). Park, Nam, and Cha (2012) assert that the ECT-IS implies that consumers' degree of satisfaction with a good or service is determined by how well it meets or doesn't meet their expectations. It is the basis for the ECT-IS, which was first put forth by Oliver (1997) and Oliver and Burke (1999). Oliver (1997) suggested that this paradigm might be applied to IS by understanding IS as a product or service users consume and evaluate based on their expectations and the system's performance. Expectancy theory, social exchange theory, and confirmation/disconfirmation theory are some of the theoretical foundations of the ECT-IS (Bhattacharjee, 2001). According to the expectation theory, people behave in ways they anticipate to behave, and their expectations are shaped by their prior experiences, social standards, and personal objectives (Vroom, 1964). According to the social exchange hypothesis, people interact with others to gain benefits and avoid costs (Blau, 1964). According to the confirmation/disconfirmation hypothesis, people's pleasure with a good or service depends on how much their expectations are met or exceeded by how well it performs (Oliver, 1980).

To explain the elements that affect people's decisions to keep using IS, ECT-IS integrates these theoretical frameworks. The ECT-IS contends that people's first expectations of IS are developed due to external elements like marketing messaging, societal influences, and prior experience (Bhattacharjee, 2001). Individuals' early adoption of IS is influenced by these assumptions. After the initial adoption, people assess a system's performance according to their expectations, and their level of satisfaction with the system depends on how well those

expectations are met or exceeded (Bhattacharjee, 2001; Gefen et al., 2003; Lee et al., 2003; Oliver & Burke, 1999; Venkatesh & Davis, 2000).

3.2.2.2 The Evolution of the ECT-IS over Time

The ECT-IS was first put forth as a two-factor model, with expectancies and confirmation as the primary factors influencing the continuation of IS (Bhattacharjee, 2001). Expectations are shaped by outside forces, including marketing communications, social pressures, and prior experiences, whereas confirmation measures how well an IS fulfils individuals' expectations (Cheng, Liu & Li, 2020). According to the ECT-IS, individuals are more likely to continue using the IS when their expectations are confirmed (Kim, Bae & Jeon, 2019). However, disconfirmation results in lower levels of pleasure and a decreased likelihood of continuation (Mishra, Shukla, Rana, Currie, & Dwivedi, 2023). According to some researchers, the ECT-IS's emphasis on confirmation disregarded the significance of disconfirmation in influencing users' views and behaviours (Oliver & Burke, 1999). The ECT-IS was updated to add disconfirmation as a third element in addition to expectations and confirmation to address this problem (Bhattacharjee, 2001). This three-factor model better captured the complicated interaction between expectations, confirmation, and disconfirmation in determining users' satisfaction and continuing behaviour (Bhattacharjee, 2001).

Figure 11 illustrates that later, researchers expanded the ECT-IS to incorporate new elements that affect users' expectations and system satisfaction. For instance, it was shown that users' early impressions of the IS's utility and simplicity had a major impact on their satisfaction and expectations (Venkatesh & Davis, 2000). Similarly, it was shown that consumers' degree of trust in the system and the provider had a substantial impact on their expectations and level of satisfaction (Gefen et al., 2003). These ECT-IS extensions demonstrate how the theory is updated and broadened to take new data into account.

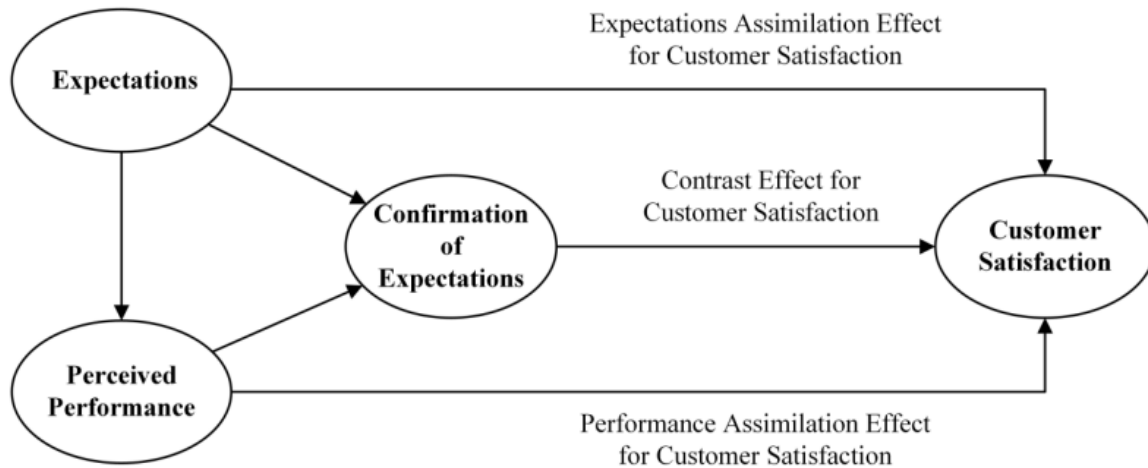


Figure 11: ECT – IS Model

Source: Oliver, (2014)

Researchers have recently examined how emotions affect people's interaction with information systems (IS). The ECT-IS was expanded to include affective states, such as enjoyment, as a critical factor in determining users' satisfaction and behaviour in the long run (Lee et al., 2011). Other researchers have examined how unfavourable feelings like frustration and anxiety affect how users view the IS and how willing they are to keep using it (Park et al., 2017). These recent advancements show how the ECT-IS is constantly evolving and being improved to consider fresh information and new trends. Finally, it can be said that the ECT-IS has developed over time into a comprehensive theoretical framework for comprehending users' choices to keep using IS. The ECT-IS has been improved beyond its initial focus on confirmation and disconfirmation to incorporate various aspects that affect users' expectations and satisfaction with the system. The ECT-IS will likely keep changing to stay current and effective when new trends and insights for understanding IS continuation emerge.

3.2.2.3. The fundamental principles constructs of ECT-IS

According to Khan and Dasgupta (2019), the ECT-IS postulates that a person's decision to keep using an information system (IS) is driven by their expectations for the system's performance and their confirmation. After acquiring an IS, a person assesses its performance in light of their initial anticipations (Humbani & Wiese, 2019). Their happiness with the system and the likelihood of continued use depend on how much their expectations are met or exceeded (Kim, Bae & Jeon, 2019). In the literature, expectations, confirmation, and satisfaction—the three core ECT-IS constructs—have been extensively addressed (Bhattacharjee, 2001; Nguyen &

Ha, 2021). Expectations are the ideas or hypotheses people have about how well the IS will function before or while using it (Hsieh et al., 2021).

On the other hand, confirmation is a process whereby people assess how well the system is performing compared to their expectations (Alqahtani, Al-Sharafi, & Rahman, 2020). Individuals are more likely to be content if the system meets their expectations; otherwise, they are more likely to be dissatisfied (Sarkar & Khare, 2019). Several studies have utilised these constructs to look into what influences Information Systems continuation. According to Alalwan et al. (2018), system quality, service quality, and information quality, for instance, all favourably impact users' expectations and happiness with IS and raise their likelihood of continuing to use it. According to other studies, perceived utility, perceived usability, and enjoyment all favourably impact users' expectations and happiness with the system, which raises the likelihood that they will use it again (Akdin, Casaló & Flavián, 2022).

3.2.2.4 Criticisms Against the ECT-IS

While the ECT-IS has been critiqued and has shortcomings, it has also substantially improved the field of IS continuation research. The section discusses the theory's criticism. Despite its utility, researchers have found flaws in the model, including its restricted focus on users' cognitive and affective beliefs and its contempt for outside elements that can affect users' decision-making processes (Algharabat et al., 2021). The Theory Hub (2023) criticised the ECT-IS because it primarily emphasises cognitive and affective elements while underplaying the importance of other factors, including environmental and social aspects. The ECT-IS does not consider these elements; for instance, social influence, cultural values, and social norms can impact users' decisions to continue using or stop using IS (Hutchins, Kerr, & Hook, 2019).

The ECT-IS also assumes that users create their expectations before or during the use of the system, but in practice, expectations can also be modified by social influence and experiences after use (Hutchins, Kerr & Hook, 2019). The ECT-IS has also been criticised for failing to adequately account for the complexity and dynamics of users' experiences with IS (Shin, 2019). Users might, for instance, have unanticipated interactions or events with the system, which would modify their expectations and opinions of the system (Shin, 2019). The ECT-IS has come under fire for failing to include the role of users' intrinsic motivation in IS usage, which may also be a crucial user belief that influences users' intentions to continue using the system

(Nascimento, Oliveira & Tam, 2018). Additionally, some academics have criticized the ECT-IS for failing to consider how context influences users' post-engagement experiences with IS (Tamilmani, Rana, Prakasam & Dwivedi, 2019).

3.2.2.5 Findings on studies that have used ECT-IS

Shiau et al. (2020) used the ECT-IS theory to analyse self-efficacy-based perspectives on the continuation of the fintech industry. The majority of individuals find intelligent tools and software easy to use while processing wealth management through fintech; thus, their widespread use enhances users' intentions to remain using fintech (Shiau et al., 2020). Researchers Franque, Oliveira, and Tam (2021) used the ECT-IS theory to gain a better understanding of the elements influencing mobile payment continuing intention: an empirical test in an African context. According to the research findings, there is a positive correlation between individual performance utilisation, satisfaction, the calibre of the available data and services, and the use and validation of expectations (Franque, Oliveira & Tam, 2021). Consumer satisfaction is impacted by the information's quality, how it's used, and how expectations are fulfilled (Franque, Oliveira & Tam, 2021).

In their study of the continuation intention for Internet banking, Rahi and Ghani (2019) used self-determination and expectation confirmation theories. They discovered that people are only intrinsically motivated by pursuits that pique their curiosity (Rahi & Ghani, 2019). In addition to intrinsic regulation and customer happiness, the interest also includes the allure of novelty, challenge, or aesthetic significance, giving managers a signal as to how to decipher consumers' intentions to stick with a brand (Rahi & Ghani, 2019).

3.2.2.6 The Rationale for Using the ECT-IS and its Relevance to the Study

According to Wang, Lin, Luarn, and Huang (2019), the ECT-IS paradigm has gained a great deal of acceptance in IS research as a comprehensive explanation for consumers' continued use of technology. The ECT-IS has been used extensively to assess the ongoing use of emerging technologies, such as payments via mobile devices. For the reason stated by Humbani and Wiese (2019), the ECT-IS is especially well-suited for assessing the use of mobile payment services since it examines the crucial elements that influence a user's utilisation of new technology after adoption (Kim, Bae, & Jeon 2019). To forecast consumer satisfaction and their intention to keep using new technology, the ECT-IS examines the affective and cognitive

beliefs that consumers face during use (Humbani & Wiese, 2019). This theory considers the person's expectations, how those assumptions were confirmed, and how it affected their level of pleasure or discontent. According to Khan and Dasgupta (2019), ECT-IS claims that a system's user satisfaction levels are crucial in determining whether users would continue to use it. According to Mishra, Shukla, Rana, Currie, and Dwivedi's (2023) ECT-IS, consumer satisfaction is determined by confirmation and perceived utility after using the information system; users who are satisfied with the system are more likely to use it again.

3.2.3 Discussion of the TTF Theory

3.2.3.1 An Overview of the historical background of the TTF

Goodhue and Thompson first put forth the TTF model in 1995. It was created to investigate the connection between IT and organizational performance by concentrating on the match between the task's and technology's attributes (Goodhue & Thompson, 1995). According to the TTF model, the degree of task-technology fit is a crucial factor in determining the efficiency of the IT system (Goodhue & Thompson, 1995). According to Eybers, Gerber, Bork, and Karagiannis (2019), the TTF theory was centred on the degree to which technology supports individuals in executing their activities. The TTF model, introduced by Goodhue and Thompson in 1995, emphasises technology and operational job characteristics. TTF models relate to technology adoption, appraisal, learning impact, and task performance (Tam and Oliveira, 2019). The TTF demonstrates that users will adopt technology only if advantageous and improves their task performance through aspects such as task characteristics and technological features (Rahi, Khan, and Alghizzawi, 2021). According to Sinha, Kumar, Rana, Islam, and Dwivedi (2019), TTF has been chiefly used to assess the effectiveness of information systems and examine how they affect human performance. By performance impacts, they mean how well a person does a set of tasks. Increased effectiveness, quality, and efficiency work together to perform better (Sinha, Kumar, Rana, Islam, & Dwivedi, 2019).

3.2.3.2 The Evolution of the TTF over Time

The task-technology fit has reportedly been applied in various information systems, according to researcher Bere (2018). In Figure 12, the initial task-technology fit theory is depicted.

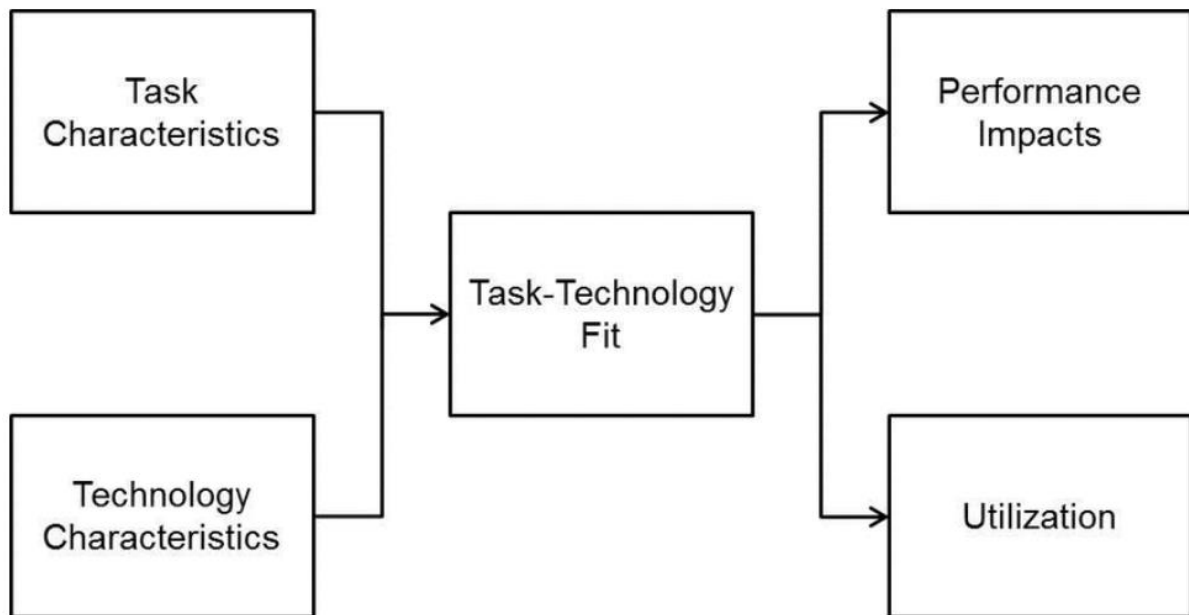


Figure 12: Task-Technology Fit Theory (Goodhue and Thompson, 1995)

Source: Adapted from Bere (2018)

The model was created as a well-recognized theoretical framework for information systems research that permits the analysis of issues relating to the performance and utilization of technology and the fit of technology to jobs (Omotayo & Haliru, 2020). TTF adopts a directly objective approach by assuming that consumers use technology that provides benefits without considering their beliefs and intentions (Lin, Wu, Lim, Han & Chen, 2019). Through an analysis of consumer behaviour and technology use, TTF explores the relationship between tasks and technology fit. Then, it suggests developing technology that successfully satisfies task requirements (Sinha et al., 2019). Since it's likely that when users accept the technology, it will function as intended, it's essential to understand how different people interact with it (Vanduhe, Nat, & Hasan, 2020). More recent research has enhanced the TTF model to include additional contextual elements, including organisational culture and change preparedness, that might affect technology adoption and use (Zhao, Lynch, & Chen, (2019).). The TTF model's progress reflects a rising understanding that technology adoption and use are complex processes that cannot be fully comprehended by focusing merely on task-technology fit or specific user perceptions (Tam and Oliveira, 2019).

3.2.3.3. The fundamental principles constructs of TTF

The theoretical model TTF is premised on four constructs: technology characterisation, utilisation, task characteristics, and performance impacts. Yuan, Liu, Yao, and Liu (2016) claim that the TTF emphasises the connections between task and technology features, usage, and performance impact. According to the TTF, when technological characteristics are matched with task characteristics, performance impact and utilisation rise (Wang, Luo, & Yu, 2022).

3.2.3.3.1 Task characterisation

According to Sinha, Kumar, Rana, Islam, and Dwivedi (2019), task characteristics refer to the activities carried out by individuals. Task characteristics, which are a synthesis of several requirements, can be a useful and successful planning tool. The unique characteristics of a task are its complexity, interconnectedness, and criticality (Hua, Kang, Zhang & Li, 2023). The task's compatibility with the technology decides whether it can be used to complete the task; as a result, users may be reluctant to use the technology when the work requirements and the technology do not align (Muchenje & Seppänen, 2023).

3.2.3.3.2 Technology characterisation

According to Sinha et al. (2019), technology characteristics refer to the tools people use to carry out their duties. According to Muchenje and Seppänen (2023), "fit" is implied when technology has precisely the proper quantity of characteristics concerning a task's requirements. Task-technology misfit is the mismatch between the task and the technology (Howard & Rose, 2019). When a task and a technology are mismatched, the technology either has too few or too many features to complete.

3.2.3.3.3 Performance impact

The degree to which the technology is task-appropriate affects the individual's performance (Muchenje & Seppänen, 2023). According to Howard & Rose (2019), TTF necessitates discovering particular tasks and technological factors that interact to affect performance.

3.2.3.3.4 Utilisation

The utilisation dimension is focused on the precursors or determinants of information system use, which includes users' attitudes about usage, computer self-efficacy, perceived utility and convenience of use, social norms, habits, and IT support (Osang, 2019). Dahleez and El-Gherbawi (2021) define usage as the extent to which technology facilitates a task. The more often technology is used, the more likely it is to successfully assist the work (Howard & Rose, 2019). Technology is only used when appropriate for the activities at hand, claim Howard and Rose (2019). Utilisation is affected by elements such as the technology's usability, the user's incentive to use it, and the accessibility of assistance and training (Vanduhe et al., 2020).

3.2.3.4 Criticisms Against the TTF

According to its critics, the TTF model implies a static and unchanging relationship between technology and task needs and fails to consider the dynamic nature of both the task and technology contexts (Marikyan & Papagiannidis, 2002). According to Marikyan and Papagiannidis (2002), the TTF theory is viewed as having weak predictive power and ignoring situational and individual factors. The TTF model needs to include methods for adjusting to changing task requirements and technological capabilities as they occur (Lee & Chen, 2022.).

The TTF model has drawn criticism for its lack of empirical support in particular situations and sectors. According to some academics, the TTF model may not apply equally well to all sorts of tasks or organizations and may need to be tweaked or adjusted to fit specific settings.

This is due to its multi-dimensional structures; it can only be used partially in various situations and circumstances (Spies, Grobbelaar, & Botha, 2022).

3.2.3.5 Findings on studies that have used TTF

The TTF was used by Rahi et al. (2021) to examine how the advancement of Internet technology has significantly altered how Internet banking services are delivered. Their findings show that perceived ease of use with TTF positively affects attitudes and consumers' intentions to remain with Internet banking (Rahi et al.2021). Tam and Oliveira (2019) suggested a research technique that integrates the TTF model with two measures of Hofstede's cross-cultural dimensions (individualism and certainty avoidance) to understand better how people use and behave when using mobile banking. The model was applied by Tam and Oliveira (2019) in a nation in Southern Europe, and the results showed that individuality moderates the

path from TTF to use. Uncertainty avoidance moderates the approach from TTF to individual performance in mobile banking (Tam & Oliveira, 2019).

To comprehend how the application of big data analytics (BDA) provides corporate value, Muchenje and Seppänen (2023) used TTF. They found that improving understanding of how BDA realizes business value (Muchenje and Seppänen, 2023). TTF was used by Vanduhe et al. (2020) to investigate the elements that enhance employee engagement, motivation, and participation, which in turn results in the employees' intentions to utilize gamification for training. They discovered that when TTF is combined with other theories like the TAM with social influence (SI) and social recognition (SR), it can predict and explain why adopting gamification for instructor training will be accepted and result in knowledge increases (Vanduhe et al., 2020).

3.2.3.6 The Rationale for Using the TTF and its Relevance to the Study

The Task Technology Fit (TTF) model is a theoretical framework that emphasises the significance of matching technology to task requirements for successful deployment and use. TTF has been extensively used in information systems as it offers a framework for comprehending the fit between technology and tasks. The TTF model has been used in numerous research to explain the acceptance and adoption of technology, especially mobile banking services. TTF has a direct and advantageous influence on consumers' intentions to use mobile banking services as well as their performance (Tam & Oliveira, 2019). The results of the study show that TTF significantly predicts users' intentions to use and accept mobile banking services as well as the factors that influence this adoption (Tam & Oliveira, 2019). The study also found that TTF influences consumers' perceptions of how useful and easy-to-use mobile banking services are.

Rahi et al. (2021) argue that TTF can be used to look at an individual's usage of mobile banking services over time. The research highlights the importance of investigating the long-term effects of TTF on users' uptake and usage of mobile banking services. Future studies should make use of TTF to learn more about how users' perceptions of technology and task features evolve and how that influences their adoption and use of mobile banking services (Rahi et al., 2021). The TTF model would be used to gather data regarding South African Millennials and Gen Z's persistent use of mobile banking apps. Given the growing popularity of mobile

banking services among this group, it is imperative to comprehend the variables influencing the acceptance and utilisation of these services by young South Africans. The TTF model offers a helpful framework for examining how the fit between technology and task requirements impacts users' adoption and use of mobile banking services (Rahi, & Abd Ghani, 2021). The TTF model offers a pertinent and practical theoretical framework for comprehending how technology and tasks must fit together (Howard & Hair, 2023). In information systems, the model is frequently used to explain how technology, especially mobile banking services, is adopted and used (Rahi et al., 2021). It has been discovered that the TTF model has an advantageous effect on users' performance and intentions to acquire and use technology (Franque, Oliveira & Tam, 2023). The TTF model would offer important insights into South Africa's Millennials and Gen Z's continuous usage of mobile banking apps (Venter de Villiers, Chuchu & Chavarika, 2020).

3.2.4 Discussion of the Social Response Theory

3.2.4.1 An Overview of the historical background of the SRT

The Social Response Theory (SRT), proposed by Nass et al. (1996), explains how social and human-technology interactions are comparable. According to the social response theory, when technology has traits similar to people's, people react by engaging in social behaviour and applying social norms (Nass et al., 1996). According to Li and Suh (2021), SRT holds that people view computer systems as social actors and respond to them socially. SRT examine how people apply social rules to respond to computers exhibiting human-like attributes (Lv et al., 2022). The social cues incorporated in an artefact's design led users to anthropomorphise technology, i.e. to have perceptions of humanness in the interaction. In addition, different studies indicate that the availability of social cues leads to perceptions of social interaction (Gnewuch et al., 2018; Diederich et al., 2019). Interactive cues such as active control, bi-communication, and language cues are the main incentives for people to respond socially to computers (Lv, Yang, Qin, Cao & Xu, 2022). For example, service robots are system-based autonomous and versatile interfaces that collaborate, communicate, and deliver service to consumers (Wirtz et al., 2018). In front-line service settings, service robots are the interactive agents of consumers and are regarded as social robots (Huang & Rust, 2018). According to Murphy, Gretzel and Pesonen (2021), the empathy ability of technology refers to its ability to

perceive, understand, and respond to human thoughts, feelings, behaviours, and experiences and is the embodiment of the social nature of technology.

3.2.4.2 The Evolution of the SRT over Time

The SRT postulates that the element of reciprocity has developed human-machine bonds to a greater extent (Cerekovic et al., 2017), having consumers not only using these devices but also developing them with various types of relationships (Han & Yang, 2018; Schweitzer et al., 2019). Social responses can be seen as a reflection and indicative of users' experiences with medium-as-social-actor presence, even though not all CASA research has done so and presence need not necessarily result in behavioural social reactions (Lombard & Xu, 2021). However, it is debatable whether societal responses to computers are any different now than they were when CASA was created given the state of technology (Gambino et al., 2020). Even though social cues have been extensively studied in the literature concerning how users' social responses to technology (Araujo, 2018; Terziolu et al., 2020), the majority of the study has been on either the effects of individual social signals or the aggregate effects of social cues.

3.2.4.3. The fundamental principles constructs of SRT

The SRT has paved the way for research showing how people use anthropomorphic computer designs to implement social rules (Adam, Wessel & Benlian, 2021). Anthropomorphism is defined as imputing human-like traits, behaviours, and emotions to nonhuman beings, consistent with earlier studies in digital contexts (Pitardi & Marriott, 2021). According to Pfeuffer et al. (2019a), the phenomenon arises from a normal human desire to use anthropocentric information to make it easier to understand unknown actors. According to Araujo (2018), the existence of human likeness in computer systems enhances users' feelings of anthropomorphism and social presence. Research has indicated that anthropomorphism and social responses can influence how positively users perceive computer systems, such as in terms of service satisfaction (Gnewuch et al. 2018; Diederich et al. 2019c), enjoyment (Lee and Choi 2017), or trust (Araujo 2018). Other research suggests that perceptions of uncanniness may result in unintended negative impacts from human-like design (Wiese & Weis, 2019). According to Seeger, Pfeiffer, and Heinzl (2018), a human approach does not always increase a user's perception of anthropomorphism.

3.2.4.4 Criticisms Against the SRT

Social reactions to artificial intelligence that incorporate social cues can be moderated by several variables and situations around users' social profiles, such as cultural origins (Liew & Tan, 2021). To the extent of moderating the impacts of competence cues, social norms, biases, heuristics, or preconceptions that influence emotions toward artificial intelligence vary across various demographic profiles (Feine et al., 2019). For instance, the consumer's time orientation Roy and Naidoo, (2021) and social phobia Jin and Youn, (2021) have different positive or negative implications for creating expert and competent artificial agents. The theory does not account for nuances, according to Guzman (2019), who examined how users interacted with several mobile virtual assistants and inferred that people may differ in how they oriented the voices to be in or on the smartphone. The social responses of people to these artefacts' cues, such as human names, natural language contact, or the social roles of these agents, are what drive the complexity of creating systems (Feine et al., 2019; Seeger et al., 2018). These social reactions influence how each person views these agents and encourage high user expectations that are frequently at odds with the agents' real capabilities (Diederich, Brendel, Morana & Kolbe, 2022).

3.2.4.5 Findings on studies that have used SRT

Ki, Cho, and Lee (2020) investigated the potential para-friendship interactions between users and virtual personal assistants. The study found that although intelligent personal assistants (IPA) have advanced to the point of detecting and simulating human emotions, less is known about whether users recognize emotional traits in their IPAs and regard these gadgets as friends with whom they can share their genuine emotions and exchange social support, leading them to regularly use their IPAs (Ki et al., 2020). Pitardi and Marriott (2021) evaluated how attitudes and trust are formed about virtual assistants (VAs). The results demonstrated that perceived ease of use and social cognition, both in terms of perceived competence, had a significant positive impact on attitude and trust; on the other hand, perceived social presence has no direct effect on attitude but positively impacts total trust (Pitardi & Marriott, 2021).

Gnewuch, Yu, and Maedche (2020), drawing on social response theory, examined (1) how a chatbot's language style influences users' perceptions of their similarity in dominance (i.e., an important personality trait) and (2) how these perceptions affect their self-disclosure behaviour. Three significant findings emerged from the data; when a chatbot uses strong and self-assured

language, consumers assume it has a dominant personality; second, perceptions of similarity are produced by the interaction between the perceived dominance of the chatbot and that of the users; third, users' level of self-disclosure improves when they believe a chatbot to be similar to them because they are more likely to follow the chatbot's advice (Gnewuch et al., 2020).

3.2.4.6 The Rationale for Using the SRT and its Relevance to the Study

Consumers may still consider service delivery in a social context and favour human connection over technology (Jakic & Marinc, 2019). According to Gummerus, Lipkin, Dube, and Heinonen, (2019), value-creating activities in the banking sector are moving away from traditional brick-and-mortar locations and toward self-service channels. Given that the banking sector is still heavily committed to relationship-based banking, this is a crucial issue (Boateng, 2019; Fernandes & Pinto, 2019). The modern banking sector faces the strategic necessity and difficulty of attracting, engaging, keeping, and motivating consumers to take action (Kosiba, Boateng, Okoe Amartey, Boakye & Hinson, 2018). In light of this, the Social Response Theory illuminates the social interaction between users and technology and offers a paradigm to support the ongoing use of mobile banking apps (Islam, Shahid, Rasool, Rahman, Khan & Rather, 2020). Anthropomorphic and algorithm-based interactions have developed in the mobile banking channel to offer a more personalized banking experience and enhanced security (Manser Payne et al., 2021). Consumers are more likely to embrace mobile AI devices when they feel connected to the service provider, which influences the value co-creation process and makes them feel more at ease using the platforms (Manser Payne et al., 2021). Understanding how technology functions in service delivery is crucial since digital technologies are evolving and altering the significance of the collaboration process.

3.2.5 Discussion of the CASA

3.2.5.1 An Overview of the historical background of the CASA

Over the past 30 years, computational technologies have been gradually incorporated into people's daily lives worldwide (Gambino, Fox & Ratan, 2020). With the rapid advancement of AI, the use of CASA has expanded beyond standard computers to include the study of human-computer interaction in various scenarios (Song, Xing, Duan, Cohen & Mou, 2022). The CASA model, which emerged from the media equation, proposed that individuals should approach

media and computers the same way they do actual people, mindlessly transferring scripts designed for interactions with people to interactions with social media (Reeves & Nass, 1996).

According to Gambino, Fox, and Ratan (2020), CASA suggests that people behave as though computers and other technology, such as social robots, are agents (or "social actors") and not merely things. Consequently, how individuals interact with technology is conditioned by the same social scripts, schemas, and norms as their interactions with other people such as the expected reciprocity and civility. According to Song, Xing, Duan, Cohen, and Mou's (2022) CASA study, consumers expect robots to have the same communication abilities as humans when interacting online. According to the CASA paradigm, people use the unthinking attribution of social traits to engage with computers like others (Arsenyan & Mirowska, 2021). According to CASA, people expect computers to be compassionate and good communicators like people. Still, because they cannot handle complex issues, consumers hesitate to employ computers in some situations (Pelau, Dabija & Ene, 2021). This helps to explain how people frequently behave as though computers and other technological devices, such as social robots, are agents (or "social actors") and not merely objects (Formosa, 2021). Human-machine communication (HMC), human-computer interaction (HCI), human-robot interaction (HRI), human-agent interaction (HAI), and media impact studies frequently use CASA as a guiding principle (Gambino et al., 2020).

3.2.5.2 The Evolution of the CASA over Time

Computer use in homes in the majority of Westernised nations has not been widespread for many years (Schulze, 2019). Smart factories, the Internet of Things (IoT), artificial intelligence (AI), 3D printing, bitcoin, and gene editing are just a few examples of the technological advancements that are reshaping businesses and economies in the fourth industrial revolution (Marr 2018). Retailers and service providers that use various technologies to support several in-store and online activities have paid close attention to the importance of progress, speed, and connectivity delivered through technology (Noble, Mende, Grewal & Parasuraman, 2022). In their study, Grewal et al. (2020b) describe how socially conscious and user-friendly technologies, such as smart shelves, augmented and virtual reality, (dis)embodied robots, avatars, and smart windows, fundamentally change in-store retailing and consumer shopping experience. The ability of technologies to emulate human virtues like inventiveness (Joshi 2022), empathy (Wu 2019), and social presence (van Doorn et al. 2017) is also improving.

The experiments that informed the development of CASA were conducted in the early days of personal computers, derived from the media equation, which explains how people communicate with media and machines, demonstrating social potential (Gambino et al. (2020). According to Westerman, Edwards, Edwards, Luo, and Spence (2020), CASA is frequently used to direct research in the areas of human-machine communication (HMC), human-computer interaction (HCI), human-robot interaction (HRI), human-agent interaction (HAI), and media effects. Due to technological advancements and broader adoption of social technologies in sectors like health care, education, and domestic life, these subfields—and the CASA research within them—have expanded over the past three decades (Fischer, 2019; Hong & Curran, 2019; Kowatsch, Schachner, Harperink, Barata, Dittler, Xiao, Stanger, Wangenheim, Fleisch, Oswald & Möller, 2021).

Following the main principle of the CASA paradigm, the MASA paradigm broadens it to include more media technologies, including present and upcoming ones (Lombard & Xu, 2021). According to the MASA paradigm, social cues can be ranked according to how likely they elicit specific social views and reactions. Designers and developers can evaluate various social cue effects and identify the best mix of cues to provide pleasant user experiences by having information on the quality of social cues (Gambino et al., 2020).

3.2.5.3. The fundamental principles constructs of CASA

Based on CASA, individuals frequently act in socially acceptable ways and treat computers according to social norms because they perceive them as independent from the programmer and having their source of information (Hong, Choi, and Williams, 2020). CASA is therefore frequently used to understand how people perceive artificial intelligence in the context of human-computer interaction, such as having more trust in an older artificial intelligence voice and their various perceptions of social robots based on multiple situations (Edwards, Edwards, Stoll, Lin & Massey, 2019).

The three main parts of the artificial intelligence ecosystem are data collection and storage, statistical and computational techniques, and output systems allow products and services to perform tasks that are normally thought to require human intelligence and autonomous decision-making (Agrawal, Gans, & Goldfarb, 2018). One prominent feature of the banking industry is digital servitisation (Mbama et al., 2018; Sengupta & Dice, 2019). Consumers' interactions with businesses are evolving due to mobile banking, which is shifting the focus

from mainly in-person, brick-and-mortar transactions to technology-mediated, customer-centric services (Laukkanen, 2016; Baabdullah et al., 2019). Changes are occurring in the roles that consumers play in value co-creation and service delivery, financial institutions, and digital technology (Lee, 2017; Choudrie et al., 2018; Dwivedi et al., 2020). Mobile banking technologies, particularly those that deal with gathering, storing, and analysing consumer data, are also a driving force behind the implementation of artificial intelligence in banks' digital and mobile platforms (Khrais and Shidwan, 2020). Personalised investment advice and fraud detection are the only examples of artificial intelligence mobile banking services available (Khrais and Shidwan, 2020). Korzeniowski (2017) cites chatbots as an example of an artificial intelligence mobile banking service that interacts with consumers in an auditory or textual manner.

Gamification, a foundational component of CASA, has the potential to develop and deploy social robot interactions for sustained human-robot interactions (Robinson, Turkay, Cooper & Johnson, 2019). Incorporating social cues and game design elements into e-business software may have several benefits. For instance, since games have reward systems, consumers may visit the mobile banking app more frequently and engage in potentially more financial activity (such as asking for financial information and conducting more transactions) (De Zubielqui, Fryges, and Jones, 2019). De Zubielqui, Fryges, and Jones (2019) propose that games have the potential to improve consumer experience, learning, and enjoyment, hence promoting the adoption of electronic channels. Utilising game characteristics in a context outside of a game is known as gamification (Robinson et al., 2019). The aspects that are present almost everywhere that gamification is used are listed in the table below.

Table 4: Categorisation of Gamification Elements

Gamification Elements	Description
Badges, Challenges, Feedback, Levels, Progress, Rewards, Points	Elements that have the potential to facilitate engagement in the context of social robotics and operate like other contexts.
Points, Leaderboards/Ranking, Social Interaction, Story/Theme	Elements that seem likely to offer unique opportunities for engagement in the context of social robotics as a function of people treating robots as social actors (CASA)

Avatars	Elements that may be problematic in the context of social robotics
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Source: Robinson, Turkay, Cooper and Johnson (2019)

3.2.5.4 Criticisms Against the CASA

According to Gambino et al. (2020), CASA needs to be broadened because people and technology have evolved and how people engage with technology. Conversational bots frequently replace human chat service representatives. Software agents, also called chatbots, are computer programs that employ natural language to interact with human users (Adam, Wessel, & Benlian, 2021). Though cost- and time-saving prospects led to broader adoption of AI-based chatbots, they nevertheless frequently fall short of user expectations, which may make users less likely to follow the chatbot's instructions (Adam, Wessel, & Benlian, 2021). The importance of perceived empathy and interaction quality is shown by research by Pelau et al. (2021) in their discussion of the relationship between computer system qualities and acceptance. Their research shows that, barring the ability to connect with users and display empathy, social traits alone do not significantly influence whether people will embrace computer systems (Pelau et al., 2021). According to Liu-Thompkins, Okazaki, and Li (2022), empathy and interaction are uniquely human ideas because they affect how people behave in social settings. CASA's applicability in mobile apps is limited because it has primarily been employed in studies on how users react socially to computers and televisions (Lombard & Xu, 2021). According to Gambino et al. (2020), technology users engage in mindless behaviour, resulting in CASA considering if humans have created and mindlessly utilize different scripts for interacting with technology.

3.2.5.5 Findings on studies that have used CASA

The CASA paradigm is demonstrated by Gambino et al. (2020), who contend that users will be more inclined to trust social robots with a human voice. They also explain how the CASA paradigm may be used for user-robot and user-phone communication. They found that user attitudes about social robots, prior interactions with robots, expectations for their performances, and willingness to suspend disbelief could all affect users' psychological responses to social robots (Gambino et al., 2020). Lombard and Xu (2021) developed the Media Are Social Actors (MASA) paradigm to consider technology changes and enhance explanations for CASA. According to the study, since technological advancements have become more interactive and

replaced human labour in previously performed tasks, less cognitive effort is needed to operate them (Lombard & Xu, 2021).

When Xu, Chen, and Huang (2022) looked at how technology differed from one another in evoking social presence and perceived trustworthiness, they found that mindlessness was more effective than mindfulness in explaining how consumers reacted to technologies in a social context. The research supports the applicability of the mindlessness explanation, which Nass and Moon first put forth in their 2000 paper, and it adds to the body of knowledge supporting the CASA paradigm's explanatory mechanism currently under dispute (Xu et al., 2022). Adam et al. (2021) showed that the CASA includes conversational agents who are not physically present and communicate with users mostly through verbal signals. In particular, under low empathy, affective and social consumer experiences were deemed superior when dealing with a human agent instead of an AI agent (Adam et al., 2021). The findings supported the ability of artificial empathy to bridge the customer experience gap between Conversational Agents and human agents.

3.2.5.6 The Rationale for Using the CASA and its Relevance to the Study

Research based on CASA has shown that people's responses to computers are fundamentally "social"; when people interact with computers, they do so according to social norms, expectations, and rules fundamental to interpersonal relationships (Formosa, 2021). Understanding the factors that promote or inhibit trust in interpersonal communication and relationships could help us better understand the interaction dynamics in human-computer touch, considering the CASA paradigm (Gambino et al. 2020). It is for this reason that the study has adopted this theory. The motivation for using the theory has also been made necessary by the core CASA principles, gamification, artificial intelligence and anthropomorphism. Gamification, a cornerstone of CASA, is viewed as an efficient marketing strategy to improve consumer experience and engagement with various activities (Emam and Abdel Aziz, 2021). The growth of electronic banking through game mechanics encourages and promotes usage, avoids inaccurate information, and stimulates the use of e-banking; therefore, it is crucial to follow e-banking with game elements to address the issue of insufficient or uncommon usage (Rodrigues, Costa & Oliveira, 2017).

Banks are being encouraged to integrate artificial intelligence into their digital and mobile platforms through mobile banking technologies, particularly those that deal with collecting, storing, and analyzing consumer data (Khrais and Shidwan, 2020). By employing the conceptual structure of service-dominant logic (SDL), examples of artificial intelligence in mobile banking services range from chatbots which converse with consumers via text or audio to more complex problem-solving services like fraud detection and customised investment advice (Mistry, 2018). Based on Manser Payne et al. (2021), the usage of AI in mobile banking includes situations with different levels of value-added. Fund transfers, bill payments, account opening, deposits, and transaction reminders are a few examples of less valuable technologies in use (Manser Payne et al., 2021).

3.2.5.7 Anthropomorphism

Acceptance of technology is an essential topic of banking, and as technology evolves and develops to feature new designs, the subject continues to attract renewed attention. One evolution stream is incorporating human likeness in technology, known as anthropomorphism. According to research, anthropomorphism has been around for decades, and 70 years ago, Turing (1950) provided instructions for what he called an “imitation game”, designed to test a machine’s capacity for intelligent behaviour. The test, now commonly known as the Turing test, asks human judges to detect whether they are conversing with a computer or a human confederate (Sheehan, Jin & Gottlieb, 2020).

The recent proliferation of AI-enabled technology (AIET), the concept of anthropomorphism, human likeness in technology, has increasingly attracted researchers’ attention. Anthropomorphism is derived from the Greek words *Anthropos* (human) and *morphe* (shape or form). It is the tendency to attribute human characteristics to inanimate objects, animals, and other nonhuman entities. The attribution of human characteristics to inanimate objects is known as anthropomorphism (Prentice, Lopes & Wang, 2019). Lin et al. (2021) define anthropomorphism as a system's behaviour during the processing of a task or service that resembles that of a human. Human-likeness in technology is the existence of human-like physical characteristics, behavioural and emotional intelligence, functions, and roles in machines (Prentice, Lopes & Wang, 2019).

Devices that use human-like cues encourage users to interact socially, which fosters acceptance and familiarity. Consumers are more inclined to interact with technology that presents them with an experience that resembles human traits through anthropomorphic aesthetic cues, according to research by Han (2021). Thus, it is unclear how anthropomorphism affects users' perceptions of the functional level (i.e., TTF, perceived cost, risk) and psychological state (i.e., trust) of mobile banking apps. To properly comprehend this link, more investigation and analysis are required. Examining consumers' intents to adopt new mobile banking applications using artificial intelligence from both a humanistic and intelligent standpoint.

3.2.5.8 Artificial Intelligence (AI)

Personal assistants, spam e-mail filters, and self-driving cars are a few examples of technology that uses algorithms to do artificial intelligence tasks (Mills, 2018). Since AI's goal is to think and act like people do while still being logical, it has started making decisions on humans' behalf (Hong, Choi & Williams, 2020). Artificial intelligence helps users and enhances their banking experience using intelligent machine performance and human-like behaviour (Prentice, Lopes & Wang, 2019). Lin, Zheng and Lee (2021) propose that artificial intelligence can assist individuals in completing tasks by comprehending their context, responding to their inquiries, and offering guidance and benefits.

Users of mobile banking who make use of artificial intelligence (AI) programs or services can get answers more quickly because, for example, these AI-powered solutions can match questions users ask accurately, saving them from having to repeatedly ask the same questions to get the answers they need through a variety of engagement (Manser Payne, Peltier, & Barger, 2018). Additionally, AI-powered mobile banking apps can replicate human emotions and actions and are designed to look like people (Lin, Chi, & Gursoy, 2020).

According to Lin et al. (2021), the most logical example of AI advancement is the transition from conventional mobile banking apps to contemporary intelligent apps. Users of mobile banking apps with artificial intelligence (AI) can receive personalised services and transactions through algorithms that manage data intelligently, assess users' emotions, and use natural language (Zhu, 2018). Anthropomorphism and intelligence are the two fundamental AI characteristics that set artificially intelligent services apart from other types of systems (Lin et al., 2021; Moussawi, Koufaris & Benbunan-Fich, 2018). In this study, intelligence is defined

as a system (mobile banking apps) that exhibits independent and practical behaviour and may help consumers with financial services or tasks (Rahman, Ming, Baigh & Sarker, 2023). Consumers anticipate artificial intelligence (AI) to deliver services at least as well as those provided by people, according to researchers who have gained a deeper understanding of AI services (Lu et al., 2019). Artificial intelligence (AI) has made mobile banking services more human-like and sophisticated. Anthropomorphic financial services may also be offered by AI (Jiang, 2018).

3.3 EMPIRICAL LITERATURE

In this section, fifteen constructs are covered: expected confirmation, gamification, performance expectancy, task technology fit, perceived artificial intelligence, perceptions of AI service delivery, perceived anthropomorphism, social response theory, perceived security, trust in a mobile banking app, adoption of the app, and satisfaction with the app. The rationale for the study's emphasis on these particular conceptual model constructs as a component of the argument is discussed in this section. The next chapter elaborates on the theories to explain the connections between these items.

3.3.1 Discussion of Perceived Security in mobile banking apps

According to Hur and Lim (2017), users' perceptions of security protection are a cognitive process that influences their emotional and behavioural intents. Users of information technology services have a relationship between their cognition, emotions, and behavioural intentions that are constantly being discussed (Lim, Kim, Hur & Park, K, 2019). This relationship influences both their persistent and non-persistent use of information technology services depending on (or in terms of) changes in attitude (Lim et al., 2019). Security concerns represent a danger to the acceptance and spread of mobile applications, despite them being at the cutting edge of mobile computation technology (Balapour et al., 2020). A rise in users' apprehensions about using mobile apps has coincided with the market for mobile apps exponential expansion (Balapour et al., 2020). Consumers frequently provide personal information when using mobile apps, which makes them particularly susceptible to the data being used maliciously (Kumar et al., 2018). 64% of smartphone users believe that apps could leave them vulnerable to digital identity theft (DataProt: 30, 2023).

Harris, Brookshire, and Chin (2018) came to the specific conclusion that minimising hazards related to app use depends on user perceptions of security. According to Balapour, Nikkhah, and Sabherwal, (2020), people are more likely to download and utilise a mobile app and regard its privacy policy as being effective when they believe it to have higher security standards. Additionally, previous studies revealed that customer perceptions of financial on privacy threats harm the perception of mobile app services (Hwang & Choe, 2019). According to Singh and Srivastava (2020), one of the key variables impacting the uptake and continuous utilisation of mobile banking has been perceived security. Perceived security is the belief that one's transactions and data are protected from disclosure, manipulation, and unauthorized access, according to Baabdullah, Alalwan, Rana, Patil, and Dwivedi (2019). A few elements that affect how secure users perceive mobile banking are its security features, their overall experience using it, and their opinions of the system's overall security (Jaride, Ahmed, Didit, Herdiawan, Jasra, Saqib, Moon, Lawu, Kusuma, Hassan, Kamaruddin & Murad, 2021). The presence of enhanced security measures, security control mechanisms, and protocols in mobile banking apps validates users' expectations about the service's dependability (Lim et al., 2019). According to Hur and Lim (2017), the mobile service meets their expectations for consistency and is therefore considered beneficial.

3.3.2 Discussion of Performance Expectancy in mobile banking apps

Performance expectancy is defined by Rasa, Shah, and Ali (2019) as the degree to which a person believes that utilising mobile banking services would make a particular financial transaction easier. Performance expectation (Purwanto & Loisa, 2020) characterises the extent of benefits obtained from employing cutting-edge technologies to complete tasks. Consumers' expectations of how much a particular technology would improve their interactions are measured by performance expectancy (Liauwputri, Evangeline, Wijaya, & Chandra, 2023). An innovation's perceived usefulness by consumers is determined by how well it performs (Chan, Troshani, Rao Hill & Hoffmann, 2022). One of the things that influences users' intent to use mobile banking apps frequently is performance expectancy (Purwanto, & Loisa, 2020). According to Liauwputri, Evangeline, Wijaya, and Chandra (2023), performance expectancy measures how much consumers believe utilising a technological system will enhance their interaction performance. Consumers employ performance expectancy as one of the variables in mobile banking in the hopes of enhancing engagement and activity performance (Purwanto & Loisa, 2020). According to Alviyana and Setiawati (2023), consumers think technology

systems will help them with tasks and produce more optimal performance. It consistently and heavily influences the adoption of both Internet and mobile banking (Chan et al., 2022).

This is consistent with previous studies showing that performance expectancy has a significant impact on the intention to use mobile apps, such as those for mobile money services (Penney, Agyei, Boadi, Abrokwah, & Ofori-Boafo, 2021) and mobile-based education (Ameri, Khajouei, Ameri, & Jahani, 2020). The consumer's perception is that using mobile banking will enhance their banking operations (Khater et al., 2023). More people will use mobile banking services if they can expect improved performance (Liauwputri et al., 2023). Consumers will employ the technology if they are confident that it will provide beneficial outcomes (Khater et al., 2023).

3.3.3 Discussion of Gamification in mobile banking apps

Gamification (GM) alters tasks, processes, services, goods, or organisational structures to enable gaming experiences (Hamari, 2019). Gamification (GM) is a concept many service providers use to engage consumers and increase participation. It was first utilised in the digital media business (Deterding, Dixon, Khaled, & Nacke, 2011). GM engages people and solves problems through the use of game mechanics and game thinking (Hamari, 2019). The key is to involve clients, draw them in with enjoyable activities, and motivate them to change their behaviour (era, Pagria, Khan, & Muaremi, 2020). Gamification uses game design techniques and aspects to boost user awareness, engagement, and loyalty in non-game situations like marketing, education, and fitness (Huang, Chen, & Liu, 2019). The gamification business will expand by 46.4% between 2015 and 2020, with total investment reaching \$11.1 billion, predicts Markets & Markets (2018). Companies have included gamification as they engage in e-commerce platform designs, applications, and customer loyalty programs (Tobon, Ruiz-Alba, & Garca-Madariaga, 2020). Gamification is now more than just a tactical choice. It appears to have become a necessary tool for companies dealing with digital consumers, who spend about 2.5 hours per day online or check their smartphones 80 times on average each day (Koivisto & Hamari 2019).

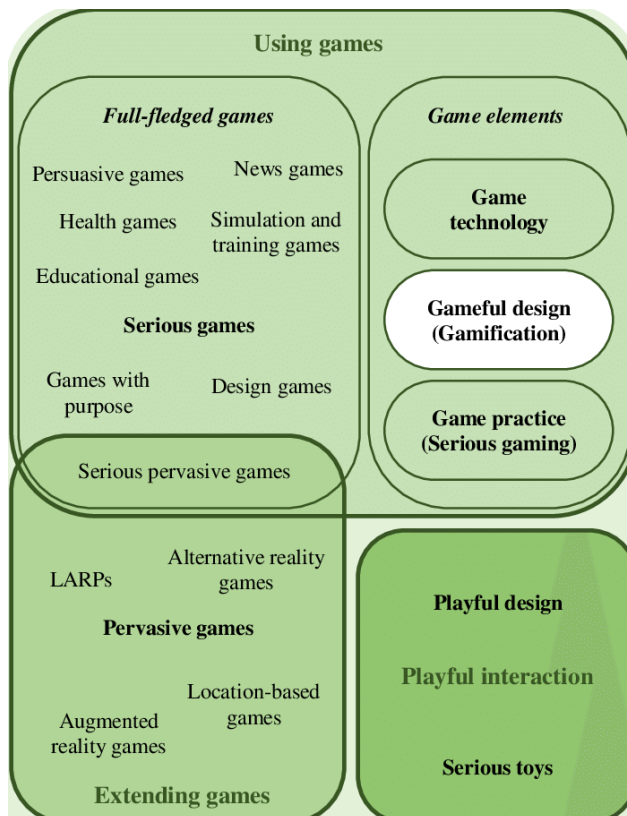


Figure 13: Gamification

Source: Deterding, Dixon, et al. (2011)

In their seminal works, Deterding, Dixon, et al. (2011) differentiated serious games from gamified applications explaining that although both are used for non-recreational purposes, the former's design is a complete game, while the latter uses only elements of Marcelo Rodrigues Magioli Sereno (2019) games. Following this reasoning, one can conclude that while gamification brings game elements to a non-game context, serious games get users into a game designed for serious purposes. So, to have the intended effect, designers should use features appropriate to the context.

3.3.4 Discussion of Mobile Interactive Quality in Mobile Banking App

According to Ho, Wu, Lee, and Pham (2020), mobile banking apps are cutting-edge financial services that are provided via smartphones and software applications and allow for interactive bank services while on the go. According to Shams, Rehman, Samad, and Oikarinen (2020), mobile banking apps are a subset of digital banking, which is a broader paradigm shift toward more interactive consumer engagement. A mobile app's interactive features, which let users interact with the brand through the app's features (Pal Kapoor & Vij, 2020), are what give it its

power. According to Wang et al. (2019), high-quality interactive engagement between service users and service providers is likely to decrease users' perceptions of uncertainty and, as a result, increase users' trust in the service providers.

3.3.5 Discussion of Mobile Service Quality in mobile banking app

In e-commerce, customer opinions on the service's result and perceptions of the service are linked to service quality (Pal Kapoor & Vij, 2020). When it comes to mobile banking, the main definition of service quality is the application's ability to satisfy the needs of its consumers (Zhou, Lim, Yu, Xu, Ren, Liu, Wang, Mai & Xu, 2021). In the banking industry, consumer satisfaction is greatly influenced by the quality of the services provided. According to previous research, mobile services are different from and superior to traditional physical services and conventional e-services because they can provide location-based, consumer-focused, personalised, and context-based services by utilising their key characteristics (Narang & Shankar, 2019; Wangmetal., 2019). Therefore, to establish a thorough grasp of what motivates positive consumer impressions about crucial service adoption measures, the construction of mobile service quality measures ought to take these important mobile commerce aspects into account (Wangmetal, 2019). According to Pal Kapoor and Vij (2020), service quality in the context of mobile banking can be defined as the retail bank's online chat service, online requests made by consumers, such as issuing chequebooks or generating PINs, and multiple touchpoints that allow consumers to interact with the bank, such as online support, email service, online requests, query and grievance handling, etc.

Consumers must feel at ease interacting with the application for mobile banking services to be delivered to them effectively (Boonlertvanich, 2019). Wulfert (2019) asserts that companies need to give consumers access to a mobile companion application with a range of features that encourage customer involvement if they want to enhance the quality of their customer service. A mobile app enhances the user experience because of features like search capability and ease (Narang & Shankar, 2019). For mobile banking services to be properly provided to consumers, they must feel comfortable interacting with the application (Boonlertvanich, 2019). Priya, Vikas Gandhi, and Shaikh (2018) state that the primary determinants of how satisfied consumers are with banking services are their encounters with functional service quality—such as accuracy and speed relationship quality such as assurance and responsiveness and the banking sector's ability to handle and resolve complaints from consumers. As a result, consumers will be happy when a product performs better than expected or the quality of the

service meets their initial expectations; on the other hand, if their expectations are higher than the product's or service's actual performance, they will be dissatisfied (Yoo, 2020).

3.3.6 Discussion of Mobile Banking App Satisfaction

Traditional banks are faced with the problem of boosting customer satisfaction and loyalty through mobile banking services as the necessity for non-face-to-face transactions increases (Shankar et al., 2021). Technology innovation has advanced past the utilitarian advantages and now takes into account the user's enjoyment and well-being (Kasilingam & Krishna, 2020). Consumers' level of satisfaction with a good or service is reflected in their level of satisfaction (Yoo, 2020). client satisfaction is defined as meeting the needs and expectations of the client (Kaur, Kiran, Grima, & Rupeika-Apoga, 2021). When assessing the user experience after using technology, satisfaction can be characterised as favourable, unfavourable, or neutral (Ameen et al., 2022; Kalia & Paul, 2021). Good experiences encourage consumers to seek out a brand again and increase brand satisfaction (Garzaro et al., 2020). Interactions between clients and service providers during the service delivery process have a major impact on consumer satisfaction levels (Wang et al., 2019a).

Satisfaction can be attained in three ways, first, the interface text or content should value the user concerning the significance of the user and achieving the user's goal through the application; second, the interface should guide the user throughout the task for which they use it; and third, various tasks for concluding a transaction or achieving a goal should be well organized (Hamid, Iqbal, Muhammad, Fuzail, Ghafoor & Ahmad, 2022). Overall consumer satisfaction with banks may rise if they can educate consumers about the benefits of utilising mobile banking and offer value-added services (Malaquias & Hwang, 2019). Consumers would feel anxious and be less likely to accept mobile banking if a mobile banking provider did not provide a transparent and safe banking service; this would decrease user satisfaction (Priya et al., 2018).

3.3.7 Discussion of Perceived Artificial Intelligence in mobile banking apps

The growth of artificial intelligence is best exemplified by the transformation of classic mobile banking apps into modern smart apps (Lin et al., 2021). According to research on mobile banking, AI approaches are now essential for implementing intelligent and personalised services because demand for them has grown in the banking industry (Milana & Ashta, 2021).

The popularity of mobile banking is currently greatly influenced by AI (Manser Payne et al., 2021). According to Prentice, Lopes, and Wang (2019), AI defines human-like behaviour and intelligent technology that works to help consumers and enhance their banking services encounter. According to Akerkar (2019), AI is a broad category of computer-aided systems that can implement sophisticated mathematical algorithms, simplify complex decision-making processes, and enable efficient problem-solving. According to Hughes, Robert, Frady, and Arroyos (2019), artificial intelligence (AI) is the capacity of a computer system to see, understand, and react to its surroundings.

By understanding users' experiences, addressing their queries, and providing them with guidance and value, AI can help consumers complete tasks (Lin et al., 2021). Perceived artificial intelligence, defined by Miller, Gilbert, Virani, and Wicks (2020), is the subjective belief that AI systems possess human-like intelligence and capacities. This study applies the construct of perceived AI to measure millennials' and Gen Z's inclination to trust AI in mobile banking apps. The value of AI is linked to how consumers view and feel about other aspects, such as technical readiness, security, and trust (Manser Payne et al., 2021). In a study of mobile app security, Balapour, Nikkhah, and Sabherwal (2020) found that users believe an app to be less safe when its perceived danger surpasses the advantages, particularly in information-sensitive fields like mobile banking. A platform's perceived risk may be lessened by confidence in the technology that powers it (Lee, Ryu, & Lee, 2019). In recent years, AI has become vital for fending off cybersecurity attacks (Srivastava, 2018).

3.3.8 Discussion of Perceptions of AI Service Delivery in Mobile Banking Apps

Radical technological advancements have significantly impacted the benefits of service delivery and transformed how services are developed, provided, and evaluated. Digital transformation is revolutionizing service ecosystems (Mbama, Ezepue, Alboul & Beer, 2018; Balapour et al., 2020; Dahl, Milne, & Peltier, 2020; Dahl, Peltier & Milne, 2018a). Consumers are given more flexibility over how, when, and where services are delivered thanks to digital servitization, which uses digital technology to create new options for value creation and income production (Sihi, 2018; Adapa, Fazal-e-Hasan, Makam, Azeem, & Mortimer, 2020). The banking sector has a very high level of digital servitization (Mbama et al., 2018; Sengupta & Dice, 2019). According to Baabdullah, Alalwan, Rana, Kizg and Patil (2019), mobile banking is changing how consumers interact with banks, moving away from primarily in-person, brick-

and-mortar transactions and toward technology-mediated, customer-centric services. The value co-creation and service delivery process are changing digital technologies, financial institutions, and consumers' roles (Choudrie, Junior, McKenna & Richter, 2018; Dwivedi, Rana, Slade, Singh & Kizgin, 2020).

Adopting AI devices in the service delivery context is not a fad but a growing trend because AI devices have several advantages over human employees (Gursoy, Chi, Lu & Nunkoo, 2019). This is supported by recent advancements in AI development and the speed of AI integration and applications into service delivery by service companies. According to Dedeoglu, Bilgihan, Ye, Buonincontri, and Okumus (2018), interactions between service users significantly impact how well consumers rate it. According to academics, employing technology to deliver consumer services challenges consumers' perceptions of services, particularly high-touch benefits (Chi, Denton, & Gursoy, 2020). The study evaluates the impact of AI service delivery on Millennials and Gen Z's trust in mobile banking apps. AI, which can mimic human behaviour and directly interact with humans, has emerged as the most competitive candidate to provide high-touch services in a rapidly evolving service delivery environment (Chi et al., 2020). This is done to balance out consumers' need for high-touch and the industry trend of being high-tech. By working with consumers directly, AI implementation as a service delivery agent can offer high-quality, individualized, and customised services (West et al., 2018). Despite the benefits of artificial intelligence (AI) technology for service delivery, prior research has indicated that not all consumers are likely to interact with AI robots and accept the services offered by these devices (Chi et al., 2020; Gursoy et al., 2019).

3.3.9 Discussion of Perceived Anthropomorphism in Mobile Banking App

Studies have used anthropomorphism to demonstrate that a technology's resemblance to a human being affects how users engage with that technology (Li & Suh, 2021). the behaviour of machines by perceiving them as social interaction According to Van Pinxteren, Pluymaekers, and Lemmink (2020), anthropomorphism is an inductive inference process whereby humans seek to explain and predict partners capable of meaningful connection. According to Moussawi and Koufaris (2019), anthropomorphism uses human-like traits in technical artefacts to enhance users' capacity for meaningful social engagement. Anthropomorphism, which refers to the attribution of humanlike features to nonhumans, has been used by researchers to capture the human likeness of computers (Li & Suh, 2021).

In this study researching millennials and Generation Z's ongoing use of mobile banking applications in South Africa, anthropomorphism—the attribution of human-like attributes to non-human entities—plays a critical role. By incorporating human-like features like chatbots or virtual assistants, anthropomorphic mobile banking applications can increase user engagement and give millennials and Gen Z users a more personalized experience (Guo & Luo, 2023). Users are more apt to interact with a relatable application that provides a customized touch (De Cicco, Silva & Alparone, 2020). The usability of mobile banking applications for millennials and Gen Z users can be improved through anthropomorphism (Van Pinxteren et al., 2020). User-friendly and intuitive design components, precise interactions, and conversational interfaces can improve the usability and intuitiveness of the app (Salvi, Geetha, & Kamath, 2019). Users, especially those who have grown up with technology, will value applications that meet their needs and provide a smooth and engaging user experience (Abu Daqar, Arqawi, & Abu Karsh, 2021).

By differentiating mobile banking applications on the market, anthropomorphism can give businesses a competitive edge (Lim, Cheah, Ng, Basha & Soutar, 2021). An application can stand out and develop a distinctive brand identity in a crowded market when many banking apps are available, including anthropomorphic aspects (Wewege, Lee & Thomsett, 2020). An application that provides a distinctive and exciting experience is more likely to draw the attention of Millennials and Gen Z, who appreciate innovation and personalisation (Chan & Lee, 2023). Due to their view of technology as a necessary component of daily life, millennials are referred to be the first high-tech generation (Thusi, 2019).

This generation has readily adopted different digital technologies because they were raised in an era of rapid technological advancements. So, for millennials, technology is not simply a tool but also a crucial part of their identity and way of life (Thusi & Maduku, 2020). Gen Z consumers, renowned for being tech-savvy, similarly value technology highly (Cheung, Leung & Chan, 2021). Gen Zers have grown up with technology at their fingertips thanks to living in a connected society. They frequently use social media, new digital platforms, and mobile applications first (Adam & Ali, 2022). When interacting with digital services like mobile banking apps, their tech-savvy influences their preferences and expectations (Abu Daqar, Arqawi & Abu Karsh, 2021).

3.3.10 Discussion of Perceived Anthropomorphism and Trust in Mobile Banking App

According to de Fine Licht and Brülde (2021), trust should be viewed as a form of reliance. Trust is defined as the degree of dependability promised by the service provider to the receiver to uphold and foster a favourable relationship between them (Ejdys & Gulc, 2020). This definition applies in the context of mobile banking. Without trust, any significant social links would be at risk (Ryan, 2020). Trust may be one of the fundamental behaviours or attitudes in human interaction. While engaging in a financial transaction, a customer runs some risk. Consumers anticipate a trustworthy (credible) mobile app from banks that will act in their best interests benevolently (Sankaran & Chakraborty, 2021). 'Incorrect' levels of trust may result in misuse, abuse, or neglect of the technology (Jacovi, Marasovi, Miller & Goldberg, 2021). This makes trust a crucial element of human-AI interaction. Incorrect levels of trust may result in misuse, abuse, or neglect of the technology (Jacovi, Marasovi, Miller & Goldberg, 2021). This makes trust a crucial element of human-technology interaction.

Deep links between people and computers have transformed human and machine relationships; trust must be built (Pitardi & Marriott, 2021). Technology adoption and usage are recognised as being strongly influenced by trust (van Pinxteren et al., 2019; Wirtz, Patterson, Kunz, Gruber, Lu, Paluch & Martins, 2018). Trust can lower perceived levels of risk associated with a contact, which facilitates consumers' intentions and behaviours (Pitardi & Marriott, 2021). According to studies on artificial intelligence service robots, the acceptability of these robots depends heavily on relationships (Wirtz et al., 2018). The degree of anthropomorphism is crucial in determining whether people will trust and use a product (van Pinxteren, Wetzels, Rüger, Pluymaekers, & Wetzels, 2019). Mobile banking apps with AI capabilities exhibit anthropomorphism (Lee & Chen, 2022; Lin et al., 2023). Users may develop views of anthropomorphism as a result of anthropomorphised AI's ability to reflect emotions in user interactions (Moussawi et al., 2020). Instilling pleasant feelings in users, altering their attitudes and beliefs about services, and improving user experiences are all possible using anthropomorphic characteristics (Pillai & Sivathanu, 2020; Balakrishnan & Dwivedi, 2021). By interacting with people and fostering emotional ties, artificial intelligence (AI) in mobile banking apps wins users' trust and strengthens their relationship with it (Lee & Chen, 2022).

3.3.11 Discussion of Mobile Banking App Adoption

Consumers' habits are adjusted to meet new trends when they adopt innovation (Elhajjar & Ouaida, 2020). Consumer adoption as well as utilisation of new technologies are significantly

influenced by and driven by the speed and ease of contact with service providers (Duarte et al., 2018). According to Souiden, Ladhari, and Chaouali (2020), the adoption of mobile banking is a "channel via which consumers connect with a bank through non-voice apps such as text- or WAP-based financial services utilizing a mobile device, such as a mobile phone. According to Singh and Sinha (2020), mobile banking applications like Mobile Money/Wallet are already widely used and helpful to consumers.

According to Chaouali and El Hedhli (2019), attitudes regarding m-banking are influenced by attitudes toward both automated teller machines (ATMs) and Internet banking. Banks must provide their consumers with superior quality services that have high added value for products, trustworthy information, and strong business relationships to encourage the adoption of mobile banking apps (Kamdjoug, Wamba-Taguimdje, Wamba, & Kake, 2021). To save time and effort when using banking services, the majority of consumers choose m-banking services (Shankar & Rishi, 2020). Consumers who use mobile banking enjoy convenience benefits such as time and effort savings (Wang, Yang & Brocato, 2018).

3.3.12 Discussion of Mobile Banking App Continuous Use

According to Moliner, Monferrer-Tirado, and Estrada-Guill (2018), banks constantly endeavour to increase consumer involvement and strive to form personal connections with their clients. To achieve this goal, banks have attempted to translate general cognitive interactions into emotional engagement linkages with the banking brand (Moliner et al., 2018; Moliner-Tena, 2019). Mobile payments are anticipated to make daily chores easier, aid in information search, and allow autonomous financial transaction conduct; this should lead to decreased stress, less complexity, and well-being, which should encourage continued use (Purohit et al., 2022). Wiese and Humbani (2019) claim that users' sentiments regarding an application will be influenced by its usability following their initial experiences with it.

When consumers use technology frequently and don't eventually move to a different service that has the same features, this behaviour is referred to as continuous use, which develops as loyalty (Baabdullah et al., 2019). The popularity of m-payments (Handarkho, 2021; Yu, Cao, Liu, Gong & Adeel, 2018) and e-wallet services (Singh, 2020; Ren and Tang, 2020; Grover & Kar, 2020) is another factor driving the continued use of mobile banking. Inan, Hidayanto, Juita, Soemawilaga, Melinda, Puspacinantya, and Amalia (2023) state that the need for cashless

transactions is not only increasing quickly among the general public as the most effective and efficient transactions but that they are also crucial during the COVID-19 pandemic.

3.4 THEORY INTEGRATION JUSTIFICATION

It is common research practice to integrate several ideas to offer a more thorough explanation of a phenomenon under study. This section explains why it is essential to combine five well-known theoretical frameworks to understand better the complex phenomenon of technology adoption: the Unified Theory of Acceptance and Use of Technology (UTAUT), the Expectation Confirmation Theory of Information System Continuity (ECT-IS), the Task Technology Fit (TTF) theory, the Social Response Theory (SRT), and the Computer as Social Actors (CASA). Figure 11 depicts the five theories used in the study and the associated features.

The Unified Theory of Acceptance and Technology (UTAUT) is one of the most widely used theoretical frameworks to describe how consumers accept and use technology. It outlines four key factors—performance expectancy, effort expectancy, social influence, and facilitating conditions—influencing users' inclination to adopt technology (Venkatesh et al., 2003). According to Hong et al. (2019), UTAUT has come under scrutiny for failing to consider how individual characteristics, such as motivation and personality traits, affect how users embrace new technologies.

The Expectation Confirmation Theory of Information System Continuity (ECT-IS), which emphasises users' ongoing use of information systems, complements UTAUT. According to this theory, a user's decision to continue using a system is influenced by their opinions of how well it performs, their initial expectations for how well it functions, and the extent to which those expectations are confirmed or disproved by the user's experience with the system (Bhattacharjee, 2001). By taking into account the cognitive dissonance that happens when users' original expectations are not realized, this theory attempts to overcome the limitations of UTAUT. Another theoretical model that complements ECT-IS and UTAUT by emphasizing the connection between task and technology features is the Task Technology connection (TTF) theory. It asserts that users' perceptions of a technology's utility affect their adoption and usage affecting how well the task and the technology fit together (Tam & Oliveira, 2019). TTF emphasises how previous theoretical models frequently fail to consider the context in which the technology will be employed (Rahi & Abd Ghani, 2021).

The Social Response Theory (SRT) complements UTAUT, ECT-IS, and TTF by focusing on the social and psychological elements affecting user behaviour. According to this theory, users' conduct is impacted by how they perceive the social expectations surrounding the use of technology, the social support available for doing so, and how confident they are in their technology use (Singh & Srivastava, 2020). SRT recognises the impact of social influence and personal views in influencing users' technology adoption behaviour and so addresses the shortcomings of UTAUT, ECT-IS, and TTF. The Computer as Social Actors (CASA) hypothesis, which acknowledges that users view technology as social actors and engage with it as humans, completes the work of UTAUT, ECT-IS, TTF, and SRT. It asserts that users respond to technology in a manner comparable to how they respond to human social actors and attribute human-like features to technology (Reeves & Nass, 1996). CASA considers the intricate social dynamics when users interact with technology to address the shortcomings of UTAUT, ECT-IS, TTF, and SRT. Integrating UTAUT, ECT-IS, TTF, SRT, and CASA can offer a more thorough knowledge of consumers' acceptance and application of technology. Researchers can determine the main elements that affect how users behave toward technology by considering individual variations, cognitive dissonance, context, social impact, and the social dynamics of technology adoption. Understanding users' acceptance and use of technology is essential for designing efficient technology-based solutions as technology continues to play an increasingly significant role in our lives.

3.5 CONCLUSION

This chapter illustrated that integrating theories can provide a more thorough knowledge of complicated occurrences, such as how users embrace and use technology. Incorporating multiple theories can give a more comprehensive picture of the elements that evaluate factors that influence mobile banking's continuous use amongst Millennials and Gen Z. The general elements that affect technology acceptance and utilisation, such as performance expectations, effort expectations, social impact, and facilitating conditions, are discussed in detail by UTAUT. With the aid of ECT-IS, it is possible to comprehend how users' expectations and opinions of the technology are connected to their continuous use. The TTF was employed to evaluate how well the mobile banking application satisfies user requirements and tasks. SRT shows how social factors, including social influence and normative pressure, affect how people

utilise technology. The CASA theory was also used to examine consumers' perceptions of the social nature of the mobile banking application and how it influences their behaviour.

By incorporating these theories, the study was better able to comprehend the elements that affect Millennials and Gen Z's continued use of mobile banking apps. The study explained how consumers' views and expectations of the mobile banking application are related to their continuous use and how this connects to the broader factors that drive technology uptake and usage. The study describes how the mobile banking app satisfies users' requirements and tasks and influences their interactions with technology. It also showed how social factors influence users' behaviour toward the technology and how they view the mobile banking application as a social entity. Combining the theories led to a more thorough and nuanced understanding of the variables influencing Millennials and Gen Z's continued mobile banking usage. This could result in more efficient ways to encourage these groups to embrace and use mobile banking applications. The following chapter discusses the hypotheses that emerged from the study.

CHAPTER 4: CONCEPTUAL MODEL AND HYPOTHESIS

4.1 INTRODUCTION

Banks must ensure that their clients continue to use their services in light of the increasing adoption of mobile banking applications, despite several research looking at the factors influencing consumers' adoption of mobile banking apps. There has not been much research on the elements that affect the continuous use of mobile banking apps, particularly when incorporating the five theories. Investigating the factors that impact the continuous use of mobile banking applications is the primary goal of this study. The study created a conceptual model to accomplish this goal based on the five theories that guided the research: UTAUT, ECT-IS, TTF, SRT, and CASA. The fifteen constructs comprising the conceptual model are thought to significantly impact how frequently consumers use mobile banking apps. Overall, this chapter covers the hypotheses that will be investigated to address the study's goals and the research topic. The conceptual framework upon which the assumptions are formed comprises fifteen constructs.

4.2 HYPOTHESES DISCUSSION

This section of the study provides a detailed discussion of the hypothesis identified.

4.2.1 Perceived Security and Mobile Banking Adoption

As a result of technology's lack of moral agency, assumptions about a given technology's capabilities rather than its intentions will determine how secure people regard that technology to be (Chauhan, Jaiswal, & Kar, 2018). Many studies have examined perceived security (Alalwan et al. 2019). The results, however, are contradictory since perceived security varies depending on the research situation. According to Hanif and Lallie (2021), perceived security is the conviction that a user's privacy won't be protected if they utilize a mobile banking application. According to Musyaffi, Sari, and Respati (2021), perceived security is the extent to which a mobile payment user thinks that transactions on those platforms are secure in terms of both financial and personal information. According to Tomi, Kalini, and Todorovi (2022), perceived security significantly impacts customer adoption. This assumption is supported by numerous research incorporating security into their models (Musyaffi, Sari, & Respati, 2021; Casado-Aranda, Liébana-Cabanillas, & Sánchez-Fernández, 2018).

Perceived security in mobile banking refers to privacy-related concerns that a technology user prevents (Ivanova & Kim, 2022). According to Zhang, Luximon, and Song (2019), the level of consumer confidence in a mobile banking platform's ability to protect personal and financial data throughout a transaction is the context of perceived security in mobile banking services. When using the construct, the study will take both contexts into account.

According to Almaiah, Alamri, and Al-Rahmi (2019), perceived security is still problematic in ongoing technological use. When deciding whether to adopt new technology, perceptions of security play a significant role (Singh & Srivastava, 2018). "Protecting the integrity, confidentiality, authentication, and non-recognition of relationships" (Chopdar, 2022) can describe how consumers perceive payment methods, storage, and online information movement. Consumers' trust in the security of mobile services is highly dependent on their perception of security (Almaiah, Alamri, & Al-Rahmi, 2019). According to the studies above, perceptions of security are crucial for mobile financial transactions (Patil, Tamilmani, Rana, & Raghavan, 2020). Thus, grounded in this literature, the following hypothesis is proposed:

H1: Perceived security has a positive relationship with mobile banking adoption.

4.2.2 Performance Expectancy and Mobile Banking Adoption

Performance expectancy is defined as the extent to which an individual thinks that utilising state-of-the-art technologies will improve job performance, per the foundational studies of Venkatesh et al. (2003). Performance expectancy is defined as an individual's belief about how much a system will help them accomplish their goals (Patil et al., 2020; Raza et al., 2021; Venkatesh et al., 2012). Savi and Peterac's (2019) study found that performance expectancy reflects consumers' beliefs about how much adopting mobile banking services will increase their ability to conduct financial transactions.

Consumers are driven to embrace new technology when they believe it will increase their interaction performance easily (Shin, Seungjae, & Won-Jun Lee, 2021). As a result, they are more likely to embrace a system if it offers them advantages (Chayomchai et al., 2020; Rosnidah et al., 2019; Sivathanu, 2019). A consumer's performance expectations of technology are a crucial factor in determining acceptance, contentment, and desire to continue using it, according to scholars Dai, Teo, Rappa, and Huang (2020). Performance expectancy in this

study will significantly show the consumer's propensity to use mobile banking apps to speed up routine use of different functionalities. Performance expectancy will therefore show how the convenience of mobile banking has affected the acceptance of mobile banking apps. As a result, the research suggests the following hypothesis:

H2: Performance expectancy has a positive relationship with mobile banking app adoption.

4.2.3 Trust in Mobile Banking App and Mobile Banking Adoption

In terms of distance financial services, mobile banking has been a major advance for the banking industry. However, a lot of consumers are apprehensive because of security worries. One notable example of how mobile technology has progressed in the banking industry is mobile banking, which allows consumers to autonomously create financial transactions through mobile devices (Obaid, 2021). According to Hu, Ding, Li, Chen, and Yang (2019), trust is the foundation of all interactions and a key determinant of whether or not a person will utilize mobile banking. Thus, consumers' expectations of the service providers they utilise are influenced by trust (Sharma & Sharma, 2019). Handi, Hendratono, Purwanto, and Ihalaui (2018) contend that being able to rely on and be trusted is the foundation of trust.

According to consumers, trust in mobile banking is the culmination of their beliefs in its capacity, goodness, and honesty, which could increase their readiness to rely on it for financial transactions (Obaid, 2021). According to Singh and Srivastava's (2018) research, trust could improve the security features offered by mobile banking services. Kumar, Dhingra, Batra, and Purohit (2020) posit that the acceptance and adoption rate of mobile banking is increased by consumers' faith in the secrecy and safety aspects provided by banks. Price value, trust, and habit were revealed to be significant drivers of intention to embrace and use mobile banking in Ghana (Kwateng, Atiemo & Appiah, 2018). Iranian bank consumers attribute their utilisation of mobile banking to their confidence in the apps (Jouda, 2020). Trust in mobile banking is one of the key elements driving adoption (Chaouali, Yahia, Lunardo & Triki, 2019). The study's conceptual framework used the idea of trust to examine how consumers' acceptance of mobile banking was impacted by it. Therefore, the following hypothesis is proposed::

H3: Trust in mobile banking apps has a positive relationship with the adoption.

4.2.4 Mobile Banking App Adoption

Consumer interest in mobile banking is increasing compared to conventional banking, such as physical banking (Liu, Li, & Wang, 2020). According to Souiden, Ladhari, and Chaouali (2020), the business climate for banks is constantly changing, forcing them to realize how critical it is to modernize and diversify their offerings. Financial transactions have always been particularly vulnerable to the disruption that new technologies might bring about, (He, Meadows, Angwin, Gomes & Child, 2020) demonstrate. To compete, banks must understand how consumers react to changing demand and technology (Kizildag, Dogru, Zhang, Mody, Altin, Ozturk, & Ozdemir, 2019; Liébana-Cabanillas, Molinillo, & Japutra, 2021; Liu, Li, & Wang, 2020; Liu, Pan, & Yin, 2020; Petralia, Philippon, Rice, & Veron, 2019).

A crucial aspect of adoption behaviour in the current period is automating and simplifying tasks to incorporate the newest technology (Abbas, Hassan, Asif, Junaid, & Zainab, 2018). As stated by Jouda, Abu, Obaid, Abu Mdallalah and Awaja (2020), the adoption of mobile banking is made possible by information technology advancements as long as problems like low availability, poor quality of the wireless products, and inadequate technological infrastructure are addressed. According to Abbas et al. (2018), the acceptance of mobile banking depends on variables such as relative advantage, perceived usefulness, perceived simplicity of use, and technical acceptance. Delays in adopting technologies and mobile banking require additional adoption research as they undercut all future use projections of the newest breakthroughs (Siyal, Donghong, Umrani, Siyal, & Bhand, 2019).

The gradual acceptance of mobile payment is impending for many consumers who still believe that digital means of payment lack the physical availability and cash that they prefer for many purchases (Kajol, Singh & Paul, 2022). However, the COVID-19 pandemic encouraged the use of cash substitutes to avoid physical contact (Flavián, Guinaliu, & Lu, 2020). Brands now have more chances than ever to please consumers, thanks to the growth of digital services (Calantone, Di Benedetto, & Rubera, 2018). Continuous use of a service, the desire to suggest it to family and friends on various social media platforms, and adoption are all factors that contribute to customer satisfaction (Kizgin, Jamal, Dey, & Rana, 2018). It is thus hypothesised that:

H4: Mobile banking app adoption has a positive relationship with mobile banking app satisfaction.

4.2.5 Mobile Banking App Satisfaction and trust in mobile banking app

Due to increased non-physical transactions, traditional banks face difficulties boosting customer satisfaction and loyalty through mobile banking services (Shankar, Tiwari, and Gupta 2021). According to Khan, Lima, and Mahmud's (2021) research, new technology-based services gratify consumers and help financial institutions become more sustainable and cost-effective. Mobile banking is an innovative technology that offers consumers quick, pleasant, convenient, and effective consumer services, according to Shankar and Datta (2018). According to Khan et al. (2021), consumer satisfaction is the emotion consumers experience when the benefits meet or exceed their expectations. Consumer satisfaction assesses whether a customer's expectations are met or exceeded by the products or services offered by a business (Gomachab & Maseke, 2018). Mobile banking app satisfaction is the users' impression of their banking experience (Gomachab & Maseke, 2018). According to Shankar and Datta (2018), achieving customer happiness involves exceeding their expectations for the mobile banking service.

Oh and Kim (2022) recommend that traditional and digital banks use mobile banking applications (hence, apps) to enhance customer service and resolve technical problems. For commercial banks to improve the mobile banking services they currently give to consumers, they must first determine what those consumers want from the banks and whether they are happy with the services they already receive (Gomachab & Maseke, 2018). Consumer assistance for mobile banking applications includes responding to inquiries about financial services and resolving technical issues such as app breakdowns (Shankar & Datta, 2018). However, when consumers encounter a delayed response from customer service or an unfriendly attitude, consumers may discredit banks (Oh & Kim, 2022). Consumers can increase their trust in mobile banking apps by using seamless communication to resolve issues, (Gomachab & Maseke (2018). According to Liu, Zhou, Ding, Palomares, and Herrera (2019), trust is widely acknowledged as a fundamental component of human social connections and, as a concept, is a critical factor in influencing consumer behaviour (Dang, Nguyen, & Pervan, 2020). It is for this reason that the study hypothesised that :

H5: There is a positive relationship between mobile banking app satisfaction and trust in the app.

4.2.6 Mobile Banking App Satisfaction and Mobile Banking App Continuous Use

According to Lee & Lee's research (2020), companies must offer simple and practical mobile apps. The apps must also be connected to current services to promote the continuing utilisation of the new service platform (Lee & Lee, 2020). Adoption is the first step toward ongoing use (Humbani & Wiese, 2019). If the net benefits are favourable, or, to put it another way, if the mobile banking app continues to assist the user or client in accomplishing personal performance, consumers may continue using it (Zoloseni, 2021). However, researchers Ashraf, Ahmad Sharif, Raza, Shabbir, Abbas, and Thurasamy (2020) contend that continuous use directly impacts the role of constant trust or the level of confidence that grows over time due to repeated usage interactions.

Acquiring a new customer can cost up to five times as much as keeping an existing one (Yuan, Lai, & Chu, 2019) suggests that ongoing use is more crucial than initial use. Continuous service usage is influenced by customer satisfaction (Kizgin, Jamal, Dey, & Rana, 2018). When they experience satisfaction, users of an app keep using it. 2019 (Yang, Lee, Lee, & Koo). In information systems and e-commerce, satisfaction is a crucial indicator of ongoing use and success (Gomachab & Maseke, 2018). Thus, it is hypothesised that:

H6: Consumers' satisfaction with mobile banking apps has a positive relationship with the continuous use of the app.

4.2.7 Expectation Confirmation and Mobile Banking App Satisfaction

Mobile services' prevalence and utilisation will skyrocket (Humbani & Wiese, 2019). Mobile transaction is anticipated to be the global future of electronic commerce, given the exponential growth of mobile services (Kumar et al., 2018). Kim (2019) claims that expectation confirmation has been used to explain why consumers choose to make more purchases or continue using a company's goods or services. Continuous usage is the choice made by a consumer to continue using a particular technology they have already utilized (Yan, Filieri, & Gorton, 2021).

When a new technology is adopted, it confirms expectations that indirectly, through satisfaction, lead to continued use (Humbani & Wiese, 2019). In other words, according to Humbani and Wiese (2019), adoption and confirmation should consider the user's experience

with the mobile payment app while confirming, adopting, or debunking the service's initial expectations. Continuous use is more significant than initial use, (Yuan et al., 2018). According to Yuan et al. (2018), acquiring a new customer could cost up to five times as much as keeping an existing one. One of the essential technical phenomena is the design of tactics to persuade consumers to utilize mobile banking consistently (Sivathanu, 2018). Despite the potential advantages that mobile banking may provide consumers, usage has been modest and, in many cases, has not met expectations (Rahi, Ghani, & Ngah, 2018b).

According to the expectation confirmation, fulfilling first mobile banking service expectations increases the pleasure of subsequent users, whereas the opposite results in unhappiness and a desire to stop using the service (Kim et al. 2019). Confirmation was positively correlated with pleasure in earlier studies (Fu et al., 2018; Peng et al., 2019). Previous research (Al-Emran, Arpaci, & Salloum, 2020) also supported the significance of the relationship between expectation confirmation and satisfaction (Humbani & Wiese, 2019). Consumers who are unhappy with a product, service, or product may stop using it (Kim et al., 2019). According to studies (Fu et al., 2018; Peng et al., 2019), satisfaction has a significant role in behaviour that leads to continuation. Therefore the following hypothesis is formulated:

H7: Confirmation expectations have a positive relationship with mobile banking app satisfaction

4.2.8 Task Technology Fit

Technologies are crucial to developing contemporary banking experiences. The construct task technology represents the ability of technology to support a task fit in the conceptual model. TTF, as defined by Shahbaz, Gao, Zhai, Shahzad and Hu (2019), is the ability of technology to support a task by matching its capabilities to the requirements of the work. TTF has been demonstrated to be extensively employed in examining the degree to which technology supports the execution of functions (Eybers, Gerber, Bork, & Karagiannis, 2019).

According to researchers Wang, Wong, Chen, and Yuen (2021), the effectiveness of a technology's adoption depends on how well its features suit the needs of the activity in which they are used. TTF assesses the fit between technological capabilities and mission requirements, demonstrating how well the available technology can support the task (Lin et

al., 2019). Consumers' adoption is boosted when technology functionalities and task requirements are in line (Cheng, 2020). As highlighted by researchers Valaei, Nikhashemi, Bressolles, and Jin (2019), the task-technology fit shows that performance characteristics must align with task and technology characteristics to fit better while utilising apps for online banking transactions. Users' adoption of technologies may also be influenced by the technology's task and functionality (Ashfaq, Yun, & Yu, 2021).

According to Shahbaz et al. (2019), the TTF model predicts that users will embrace a system when its features match those needed to complete a particular task. A mismatch between the user's necessary duties and the technology's ability to improve job performance may prevent technology adoption (Shahbaz et al., 2019). Adoption will also happen when the user considers the technology practical, simple, and sophisticated. According to Rahi, Samar, Mubbsher, and Mahmoud (2020), users will only adopt technology if it is useful and enhances task performance. According to Abbas et al. (2018), the TTF model illustrates how the task fulfilment qualities of new technology affect its acceptability. Thus, the study hypothesises as follows:

H8: A positive relationship exists between task technology fit and a consumer's mobile banking app adoption.

4.2.9 Gamification and Expectation Confirmation

Gamification is defined by Tobon, Ruiz-Alba, and Garca-Madariaga (2020) as integrating game mechanics into non-game contexts to encourage behavioural changes. Users enter a flow state when gamification boosts their cognitive and affective experiences (Sarkar & Khare, 2019). Gamification uses games' enjoyable, playful, objective, and demanding elements to seek real-life benefits instead of only amusing ones (Hwang & Choi, 2020). According to Era, Pagria, Khan, and Muaremi (2020), the game's mechanics and dynamics impact how well a habit takes hold when used with a mobile application. It has been demonstrated that gamification adds value for users by encouraging a sense of control, social interaction, goals, progress tracking, incentives, and prompts. According to Eisingerich, Marchand, Fritze, and Dong (2019), this encourages consumers to use the service and test out new features. Due to their more substantial connection to the affective part of the experience linked with the mobile banking context, gamification of the mobile banking service is regarded as a peripheral cue

(Cyr, Head, Lim, & Stibe, 2018). To draw in consumers' interest, the concept of gamification is applied (Kristian & Napitupulu, 2022). Thus, a hypothesis is proposed that

H9: Gamification has a positive relationship with expectation confirmation.

4.2.10 Mobile app interactive quality and expectation confirmation

Digital banking significantly impacts banks' marketing efforts to supply interactive services since it changes consumer interfaces (Mbama, Ezepue, Alboul, & Beer, 2018). Banks' ability to provide multi-channel services because of digital banking has changed how they engage with consumers (Payne, Peltier, & Barger, 2017).

According to Sun et al. (2021), the interruptive quality of interpersonal interactions between shoppers, which might take the form of either buyer to sellers or buyers to other shoppers, is the perception of these interactions. The term "interactive quality" describes the two-way interaction between the customer and the service provider (Tetteh & Boachie, 2020). Interaction quality has grown to be one of the key metrics used to assess the purchase quality of mobile devices (Sun et al., 2021). Previous studies analysed e-commerce apps in terms of system quality, information quality, and service quality when evaluating the relationship between consumer repurchase intention and the quality of electronic and mobile applications (Sullivan & Kim, 2018). The direction of information flow between platform members (merchant vs consumer vs other consumers) is interactive and multilateral (Sun et al., 2021). According to Sun et al. (2021), using the indicator of interactive quality can help measure user engagement with the platform more precisely.

Because consumers' interactive participation primarily aims to reap benefits, interactive quality can more accurately gauge the relationship between users and the platform (Sun et al., 2021). It is therefore hypothesised that:

H10: Mobile app interactive quality has a positive relationship with expectation confirmation.

4.2.11 Mobile app service quality and expectation confirmation

Studies have emphasised the significance of service quality in customer acquisition and retention, according to scholars Wang, Ou, and Chen (2019). According to research by Pham,

Limbu, Bui, Nguyen, and Pham (2019), the interactions between consumers and service providers determine the quality of mobile services. Service quality in mobile banking can be defined as the retail bank's online chat service, online requests like creating PINs or resolving chequebook problems, and multiple touchpoints that connect a customer with the bank, such as online support, email service, online submissions, query and grievance handling, etc (Pal Kapoor & Vij, 2020). To understand how to deliver and evaluate offering higher service quality, the banking industry should thoroughly understand how consumers perceive and evaluate mobile services provided, particularly mobile banking transactions, (Alshurideh, Salloum, Al Kurdi, Monem, & Shaalan, 2019). Consumer loyalty can be attained by providing high-quality service (Safi & Alagha, 2020). Biswas, Nusari, and Ghosh (2019). demonstrates how consumer expectations differ in an online context compared to a physical one, by evaluating consumers' overall expectations based on a company's performance to determine the service quality of the physical.

Ju, Back, Choi, and Lee (2019) assert that a mobile app's ability to satisfy consumer expectations will impact consumer satisfaction. As a result, the expectation confirmation may be considerably affected by the quality of mobile and electronic services (Ju et al., 2019). When consumers receive poor service and feel useless or of no value, they will likely be discouraged from reusing it (Li & Shang, 2020). Their responses directly impact the validity of the contact. Consumer expectation confirmation in the mobile environment relies on the quality of the mobile service, particularly in terms of how well the mobile application portrays items and services and provides the consumer with pertinent information to raise the likelihood of purchase (Biswas et al., 2019). Therefore the study hypothesised that:

H11: Mobile app service quality has a positive relationship with expectation confirmation.

4.2.12 Social Response and Mobile Banking App Satisfaction

Consumers respond socially to the social indications of technology, such as contact using natural language, emotional expression, or a human name (Pfeuffer, Benlian, Gimpel & Hinz, 2019). Regarding non-verbal cues, research on response times reveals that despite making consumers wait longer, dynamic delays positively impact humanness, social presence, and user happiness (Gnewuch, Morana, Adam, & Maedche, 2018). According to Lombard and Xu (2021), consumers' social responses include but are not restricted to users' social presence, the

perceived allure of technologies, the perceived integrity of technologies, conformance behaviour, and intention of future use.

Consumers with sufficient social presence are more likely to exhibit favourable cognitive, affective, and behavioural responses, leading to brand engagement (Algharabat et al., 2018). According to research by Moliner-Tena (2019) and Moliner et al. (2018), banks continuously endeavour to increase consumer involvement and form relationships with them. As a result, this aids banks in developing strategies that successfully connect consumers' cognition, emotions, and behaviour, resulting in more enjoyable interactions and long-lasting connections that boost satisfaction and loyalty (Garzaro, Varotto, & Carvalho Pedro, 2020). It is thus hypothesised that:

H12: Social response has a positive relationship with mobile banking app satisfaction.

4.2.13 Perceived Anthropomorphism and Social Response

Consumers are more inclined to interact with technology that provides them with an experience that displays human-like qualities through visual cues motivated by anthropomorphism, (Han, 2021). Consumers' significant social reactions to human-like representation and behaviour, which opens up new possibilities for the anthropomorphic design of technology products, is one of the most intriguing phenomena technology offers (Seeger, Pfeiffer, & Heinzl, 2018). Consumers defend their opposition to the use of AI in service delivery by assuming that interaction will require more work than it would with a human employee because they will need to treat the AI device as an intelligent being based on their own social beliefs and norms (Kim & McGill, 2018). According to researcher Althuizen (2018), consumers' subjective assessments of the benefits and sacrifices associated with new technologies, such as AI gadgets, change when they have insufficient experience. This affects decisions about whether these technologies are worthwhile to use. Consumers who interact with a human-like AI device might do so according to their social conventions and beliefs (Kim & McGill, 2018). Because they will be expected to perform two distinct types of activities—the effort necessary to interact with a natural person and the effort necessary to learn a technological device—this process will probably require more effort. Gursoy et al. (2019). As a result, consumers are more concerned about the effort needed when utilising technology products due to human similarity. It can therefore be hypothesised that:

H13: Perceived anthropomorphism has a positive relationship with the social response.

4.2.14 Perceived Anthropomorphism and Trust in the mobile banking app

Consumers use any available information to conclude a company's reliability based on their impressions of its intelligence and anthropomorphism traits when transacting on mobile banking apps (Lee & Chen, 2022). Anthropomorphism in chatbots increases the impact on consumers' attitudes, contentment, and emotional connection to the provider's brand (Araujo, 2018). Consumers perceive a mobile banking app as being similar to an average human when it completes a banking task (Lin et al., 2021). As a result, when consumers see mobile banking apps as intelligent and kind, they are more inclined to trust them (Lee & Chen, 2022). Consequently, the research puts forth the following hypothesis:

H14: Perceived anthropomorphism has a positive relationship with trust in the mobile banking app.

4.2.15 Perceived artificial intelligence and Trust in a mobile banking app

Researchers Lee and Chen (2022) define artificial intelligence as a system that can help consumers with financial services or tasks and has practical and autonomous behaviour (in this case, mobile banking apps). Users will erroneously believe that AI technology is more reliable than traditional mobile banking applications if consumers find AI-enabled mobile banking apps to be kind, pleasant, friendly, and considerate of others Lee and Chen (2022). Moussawi and Koufaris (2019) contend that adding intelligence guarantees that mobile banking apps have minimal glitches, hence boosting consumer confidence in mobile banking. Consumer trust is essential for effective user-AI service interactions when consumers access mobile banking. The reason trust matters in mobile banking research is that it affects how AI-facilitated mobile banking adoption will interact in the future (Gupta et al., 2019; Malaquias & Hwang, 2019; Sarkar et al., 2020).

Consumers can build connections based on trust and get over their fear of the unknown by disclosing personal information to trustees (Moussawi et al., 2020). The three ways that intelligence manifests itself in mobile banking apps are autonomous effectiveness, language processing and production ability, and support for and understanding consumer requests (Lin et al., 2021). Consumers' perceptions of these intellectual traits can influence how trustworthy

they feel about mobile banking. Additionally, research has demonstrated that consumers who lack trust are hesitant to use mobile banking for transactions due to their concern that money or private information could be disclosed to third parties without their knowledge (Gupta et al., 2019; Owusu Kwateng et al., 2019; Merhi et al., 2019; Lie'banaCabanillas et al., 2016; Sharma & Sharma, 2019). Consequently, the research puts forth the following hypothesis:

H15: Perceived artificial intelligence has a positive relationship with trust in a mobile banking app.

4.2.16 Perceptions of artificial intelligence service delivery and Trust in a mobile banking app

Intelligence has become a significant identity for any AI-powered systems as the cognitive and reasoning capacity in processing data has become a fundamental aspect of any AI algorithm (Hossain et al., 2020). From a business standpoint, intelligence influences users' perception, mainly when adding human-like features to an object. Perceived intelligence is the consumer's assessment of an aspect of technology's capacity and intellect (Dellermann et al., 2019). In addition to serving as a tool, digital assistants have evolved into participants in the decision-making process for consumers, according to Seeber et al. (2020). By highlighting how these tools have begun to play a significant part in human life and how their intelligence is compounding based on learning, Dellermann et al. (2019) justified the same. In their research, Yang et al. (2020) explained how machine intelligence may improve business operations and offer personalised customer support. Thus the study hypothesises that:

H16: Perceptions of artificial intelligence service delivery positively correlate with trust in a mobile banking app.

4.3 CONCEPTUAL MODEL

The research was supported by the following five theories: UTAUT, ECT-IS, TTF, SRT and the (CASA). Fifteen constructs make up the conceptual model, and it is thought that these will influence the continuous use of mobile banking applications by Millennials and GenZ. Integrating these five theories offers a comprehensive framework for comprehending the factors that affect the continuous use of mobile banking applications.

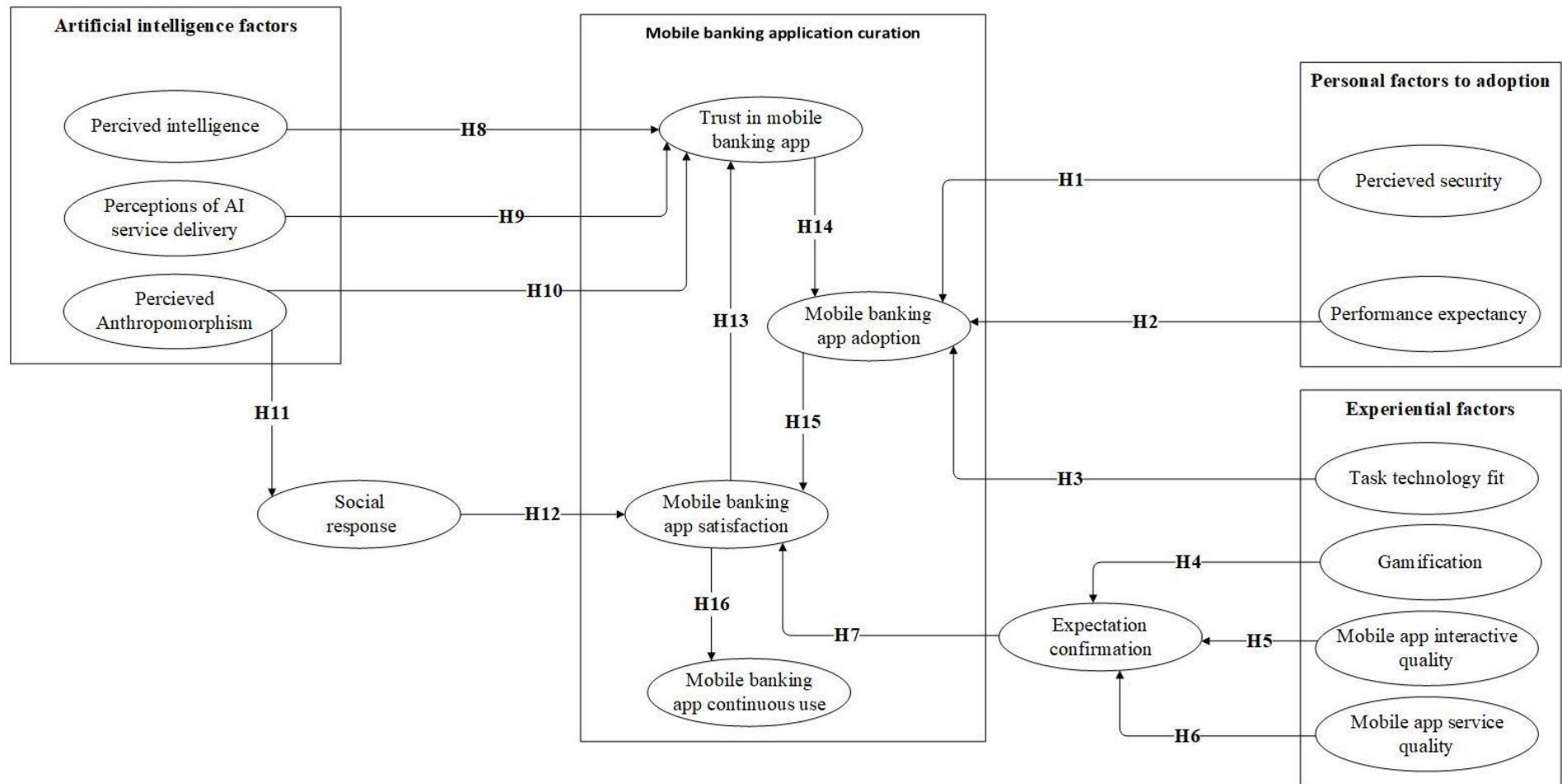


Figure 14: Conceptual Model

Source: Researcher's compilation (2023).

4.4 CONCLUSION

Formulating research hypotheses is an essential step in the research process. The research design and data-gathering processes are guided by hypotheses, which act as preliminary predictions. The research theories that guide this investigation are described in Chapter 3. The transformation of banking industry services and products brought on by the rising use of intelligent devices, ubiquitous data and wireless technologies is the research is the impetus of this study. It has been difficult for banks to stand out from the competition and gain consumer loyalty due to the homogeneous nature of banking products and services. This study intends to determine the variables that affect the continuous use of mobile banking apps among Millennials and Gen Z. Five theoretical frameworks—UTAUT, ECT-IS, TTF, SRT, and CASA, are the foundations for the hypotheses presented in this study. These theories offer a framework for comprehending the factors that affect the continuous use of mobile banking applications among Millennials and Gen Z. These theories explain the connections between several factors presented in this study. This chapter has summarised the theories supporting this investigation. In research, hypotheses are essential because they offer a framework for defining the topics the analysis aims to address. The relationships between the factors under consideration can be explained or predicted tentatively by a hypothesis. They direct the study procedure, influencing the techniques and methodologies employed for data collection and analysis. Five theoretical frameworks—UTAUT, ECT-IS, TTF, SRT, and CASA have been used to develop the hypotheses in this study. These hypotheses give a thorough grasp of the variables that affect the continuous use of mobile banking apps among Millennials and Gen Z. The purpose of the study is to provide a more excellent knowledge of the factors that affect the continuous use of mobile banking apps among Millennials and Gen Z. through the evaluation of these hypotheses.

The next chapter describes the methodology that was employed in this study to investigate the hypotheses. The research design, sampling tactics, and procedures for collecting and analysing data for the study will all be covered in this chapter. The research methodology is thoroughly reviewed in the following chapter to guarantee the validity and rigour of the study's methodology. In conclusion, this study aims to contribute to the body of knowledge by identifying the elements affecting Millennials and Gen Z's continued usage of mobile banking apps. This will provide insights into how banks could distinguish their offerings to win over consumers.

CHAPTER 5: RESEARCH AND METHODOLOGY

5.1 INTRODUCTION

The conceptual model and hypothesis testing were discussed in the preceding chapter. The conceptual model illustrates the expected relationship between your variables. Hypothesis testing determines whether there is enough statistical evidence favouring a particular belief or hypothesis about a parameter. The following part of this study, chapter 5, describes how the researcher conducted the study by providing details in the following sections. It defines the relevant objectives of the research process and maps out how they come together to draw coherent conclusions.

Scholars Nayak and Singh (2021) define research methodology as methods and strategies used to guide research, considering principles, procedures, and practices that govern research. There are four primary sections to the chapter in the study. It starts with setting the tone for the entire chapter in the introduction section. The discussion then shifts to the research philosophy and the study's methods. The marketing research process adopted by the study provides a holistic view by providing a series of tasks through several sub-sections, including problem definition, critical literature review, generation of hypotheses and research design. An outline of the research approach will be given in the chapter's final section. This chapter will consider the application of the research onion in explaining research methodologies for this study. The research onion in Figure 15 below, developed by Saunders et al. (2007), describes the systematic and organised framework for planning and carrying out research in a rigorous and morally responsible manner (Saunders et al., 2019).

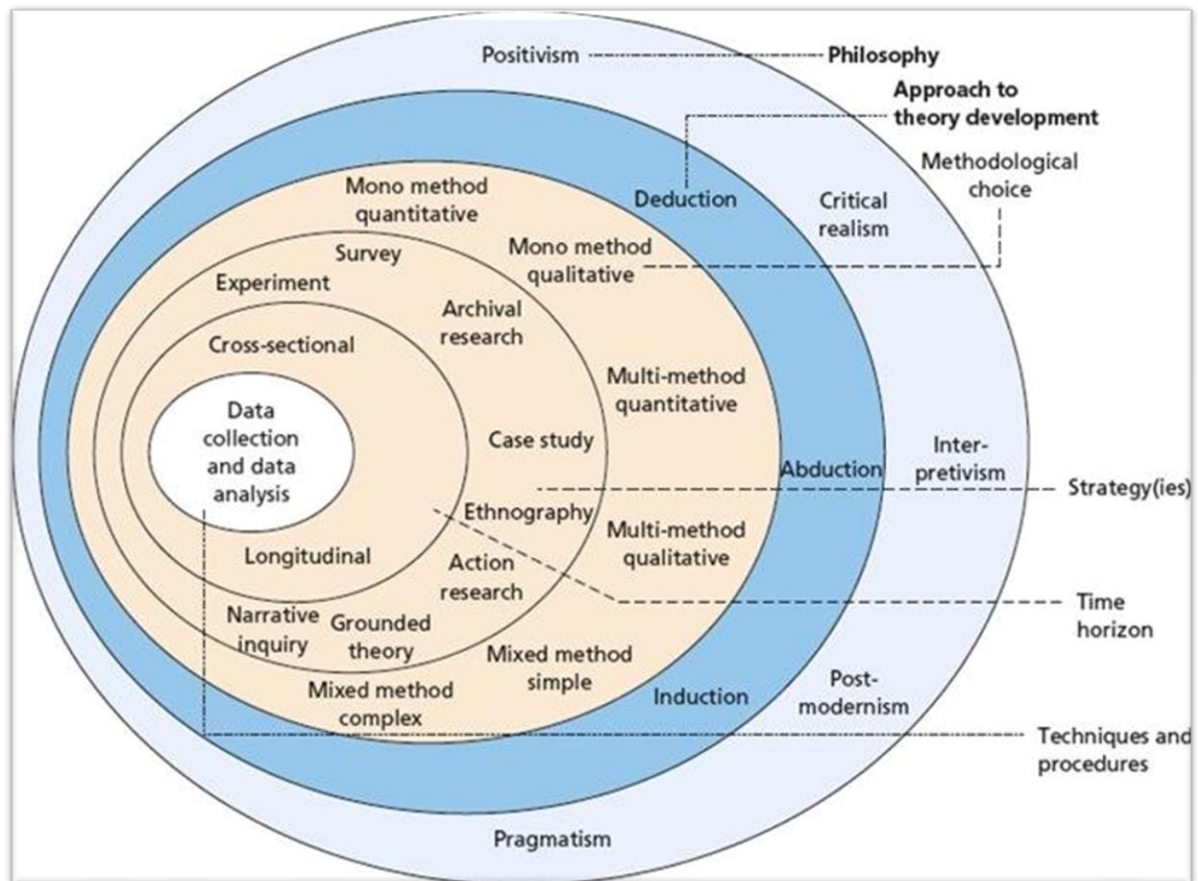


Figure 15: Research Onion

Source: Adapted from Mark Saunders, Philip Lewis and Adrian Thornhill (2016).

Planning and arranging research endeavours can be aided by using the research onion. The six layers of the research onion include the researcher's philosophical perspective, research methodology, research strategy, research design, data collection techniques, and data analysis techniques (Creswell, 2019). Throughout this chapter, aspects of the research onion will be referenced and applied to elaborate on the following sections.

1. Research Philosophy: This layer entails choosing the researcher's fundamental presumptions and convictions regarding truth, reality, and the researcher's place in it. Positivism and interpretivism are basic research philosophies (Saunders et al., 2019).
2. Research Approach: In this layer, the type of research topic and the general research methodology are chosen (Bryman, 2019).

3. **Research Strategy:** This step entails choosing the precise research method that will best address the research issue, such as a case study, experiment, survey, or ethnography (Yin, 2019).
4. **Data Collection:** This layer entails choosing the proper techniques for gathering data, such as interviews, surveys, observations, or secondary data (Creswell, 2019).
5. **Data Analysis:** This layer entails choosing the proper techniques for analysing the gathered data, such as statistical analysis, content analysis, or grounded theory (Miles et al., 2019).
6. **Research Ethics:** This layer entails thinking about the ethical aspects of the research, including gaining informed consent, safeguarding participant anonymity, and ensuring the research is carried out ethically and responsibly (Bryman, 2019).

5.2 RESEARCH PHILOSOPHY AND APPROACHES

As noted by Muhaise, Ejiri, Muwanga-Zake, and Kareyo (2020), research philosophy aims to explain the system of beliefs and assumptions about knowledge development. Scholars Mark (2019) propose research philosophy as the body of ideas and assumptions about knowledge development. The research philosophy shows how the researcher views the topic and contains essential assumptions upon which the researcher will base their work. The research philosophy serves as the foundation for the study's approach; it chooses the methodology employed to address research questions, the methods and techniques utilised for data collecting, the methods used to analyse the findings, and how the study will communicate the findings.

5.2.1 Research Philosophy

The research onion, which focuses on the researcher's philosophical position in its first layer, offers a framework for organizing and conducting research (Saunders et al., 2019). This layer includes five study philosophies: postmodernism, interpretivism, pragmatism, critical realism, and positivism (Bryman, 2019). A study's research methodology will vary based on whether it is mixed, qualitative, or quantitative (Grønmo, 2019), which clarifies the choice made. According to Mark et al. (2019), research philosophies are summed up in Table 5.

Table 5: Research Philosophy

Research Philosophy	Overview
Positivism	Positivism, related to the philosophical perspective of natural scientists, entails using an observable social reality to generate generalizations that resemble laws.
Interpretivism	The emphasis of interpretivism is on how people create meanings, which sets them apart from physical occurrences.
Pragmatism	According to pragmatism, ideas are only meaningful when they facilitate action.
Postmodernism	Language and power relations are involved in postmodernism, which aims to challenge conventional wisdom and give voice to alternative, marginalised viewpoints.
Critical realism	The underlying realities that shape observable occurrences are explained by critical realism in terms of what we observe and experience.

Sources: Adapted from Mark et al. (2019)

This study will adopt the positivism philosophy because it will apply approaches that acquire information empirically based on measurement and observation supported by this philosophy. Additionally, the chosen research method's rationale is explained by the adopted research philosophy (Creswell & Creswell, 2018).

Employing positivism as a research philosophy provides a strong foundation for guaranteeing objectivity, rigor, and reliability, all of which are essential for generating results that are both empirically valid and generalisable. The use of measurable, observable phenomena is emphasised by positivism, which frequently results in the formulation of hypotheses that can be verified by empirical evidence (Creswell & Creswell, 2018). This is consistent with the scientific process, which makes it possible to replicate discoveries and guarantees that they can be examined and verified in various settings, increasing their dependability for practical applications (Creswell & Creswell, 2018).

5.2.2 Research Approach

The theory development approach is examined in the second layer of the study onion. According to Saunders et al. (2019), three research methodologies exist induction, deduction, and abduction. An overview of the research methodologies is presented in Figure 6.

Table 6. Comparison of research approaches			
	Induction approach	Deduction approach	Abduction approach
Logic	Here, a researcher use premises developed from observations to draw untested conclusions	Here, when premises based on an existing theory are true then the conclusions are also true	Here, a known premises (Generally some surprising or incomplete conclusions) are used to generate testable conclusions
Generalization process	From specific to general	From general to specific	Interaction between the specific and the general
Generalizability	The findings cannot be	The findings can be generalised to the research settings or the context the theory is applied	The findings can be generalised to the research settings or the context the theory is applied
Use of data	Researcher collects data to identify patterns, themes and come up with a conceptual framework as conclusion	Data is collected to test hypothesis related to an existing theory	Researcher collects data to identify patterns, themes and come up with a conceptual framework and to test hypothesis (from the conceptual framework) with subsequent data collection
Theory	Theory is built (note: theory cannot be verified by inductive research approach)	Theory is falsified or verified	Theory is generated or modified; mixing existing theories to build new theory or modify existing theory
When to apply?	When your research question is to answer; Why something happens? Lack of theory to explain the phenomena	When your research question is to describe; What is happening?	When your research question is to describe and test some surprising or incomplete conclusions.

Figure 16: Research Approach

Source: Adopted from Saunders et al. (2019)

A deductive search approach will be used to build the hypothesis for this study. Park et al. (2020) describe the deductive approach as a cyclical process with a theory derived from the literature as the starting point, testable hypotheses being developed, and empirical research being conducted.

5.2.3 Research Methodology

The research methodologies are presented on the third layer of the research onion. A thorough explanation of the various research approaches is given in Table 6 below. Grønmo (2019) contends that the determination of a study's research methodology is contingent upon whether it adopts a qualitative, quantitative, or mixed methods approach. The chosen methodology shapes the overall research design and influences the collection, analysis, and interpretation of data, reflecting the researcher's fundamental approach to understanding the research questions at hand.

Table 6: Research Methodology

Research Methodology	Overview
Qualitative research	A method for investigating and comprehending the meaning that particular people or groups assign to a social or human problem. The research process includes developing questions and techniques, data collection that typically takes place in the participant's environment, inductive data analysis that builds from specifics to broad themes, and the researcher's evaluation of the significance of the findings. Those who participated in this inquiry support a research methodology honouring an inductive style, and the final written report has a flexible format. Personal significance and the significance of accurately reporting a situation's complexity will be emphasised.

Quantitative research	Quantitative research tests theoretical hypotheses by analysing the correlation between variables. These variables can be measured to enable statistical analysis of numbered data, often using instruments. An introduction, literature and theory, methodology, findings, and commentary make up the framework of the written report's final version.
Mixed methods research	Utilising both quantitative and qualitative data collection techniques is part of mixed methods research. It merges the two data formats using designs that may include philosophical presumptions and theoretical frameworks. The fundamental tenet of this type of research is that integrating qualitative and quantitative data results in new insights that go beyond what can be learned from either type of data alone.

Sources: Adapted from Grønmo (2019).

Quantitative research aims to gather numerical data, evaluate it using statistical techniques, test hypotheses, and make statistical inferences regarding a population or phenomenon (Creswell & Creswell, 2018). Quantitative research involves quantifying and analyzing variables to get results; it uses numerical data analysis using specific statistical techniques to answer the research question (Apuke, 2017). Scholars Mark et al. (2019) identified quantitative research as assessing the relationship between variables, which are numerically measured and analysed. The quantitative analysis utilises controls to ensure data validity (Mark et al., 2019).

5.3 THE MARKETING RESEARCH PROCESS ADOPTED IN THE STUDY

This chapter's section details how the researcher adopted the marketing research process.

5.3.1 Marketing research process

Bilgin (2017) emphasises the importance of obtaining accurate and valid findings on the complex research issue in explaining the marketing research method. A marketing research approach aids a study in achieving its stated goals and objectives (Malhotra, David, & Nunan, 2017). Although there is a vast amount of academic literature on the marketing research process, many of these studies have comparable backgrounds but vary in the number of stages

they include. According to Bilgin (2017), there are seven stages in the research process: defining the issue (or opportunity), designing the study, creating the data collecting forms, identifying the sample, data gathering, data evaluation, writing the study report, and presenting the results. While Malhotra et al. (2017) only list six phases—problem conceptualization, research strategy development, study design development, fieldwork or data collecting, data integrity, analysis, and communication of research findings—Malhotra et al. (2017) specify a total of ten.

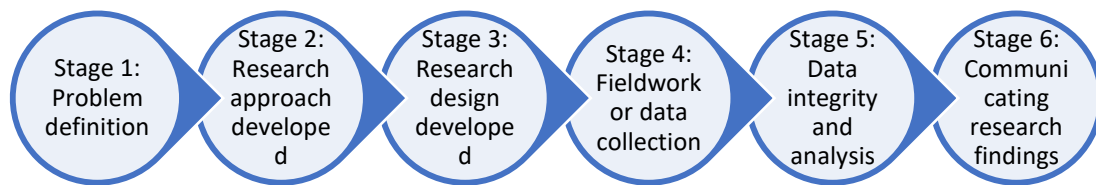


Figure 17: Marketing Research Process

Source: Malhotra et al. (2017).

The six steps of the marketing research technique will be used in this study, as outlined by Malhotra et al. (2017). According to Malhotra et al. (2017), the following are the basic steps in the marketing research process: problem definition, approach selection, research design development, fieldwork execution, data preparation and analysis, report production, report presentation, and task conclusion. The marketing research process addresses and advances the study's objective.

Table 7: Marketing Research Process

Process Stage	Overview
Stage1: Problem Definition	Defining a marketing problem for a researcher to comprehend it is critical. The researcher must know the problems' symptoms and underlying causes to understand the issue.
Stage2: Developing a research approach	Finding the variables that affect study design depends critically on the researcher's effort to build an approach to the research challenge. This step's selection, adaptation, and development of a suitable theoretical framework to support a research design are essential components.

	Understanding the interconnected nature of the target participants' features, the questions to be asked, and the context in which this will depend on "sound" theory. The researcher can choose "what should be measured or understood" and "how best to encapsulate and communicate the measurements or understandings" with the use of "sound" theory. The researcher also creates an appreciation analysis of the gathered data to decide what should be measured or encapsulated.
Stage 3: Research design	A research design is an outline or framework for a marketing research endeavour. It describes the steps necessary to get the needed information. Its goal is to create a study design that will test the relevant hypotheses, identify potential responses to given research questions, and deliver the data required for making decisions. The research design may also include using experimental methodologies, accurately identifying the variables to be investigated, and creating suitable scales to assess variables. The researcher needs to consider collecting information from the participants, for example, by doing an experiment or survey.
Stage 4: Fieldwork or data collection	This procedure's first step is collecting and analysing secondary data sources. The researcher gathers Secondary data for objectives unrelated to the current issue. The information gathered through surveys that may have been completed in the past and accessed through libraries or online resources may be kept by the organisation in the form of databases that describe the types and frequency of customer purchases. This step makes it possible to avoid duplicating previous work and receive direction on sample strategies and what to quantify or qualitatively encapsulate. If secondary data are collected and analysed, the research process may be complete—that is, there may be enough data to interpret and present conclusions to the decision-maker, filling in any information gaps. The foundation and primary emphasis for gathering preliminary data is secondary data.

Stage 5: Data analysis	Editing, coding, transcribing, and data verification are all parts of data preparation. To guarantee the reliability and correctness of the results, step 5 is essential. Data integrity and analysis are fundamentally the same for both quantitative and qualitative data collection methods for secondary and primary sources. Data analysis is not considered after the researcher has collected the data. Such factors are a crucial component of the formulation of an approach, the outcome of a study design, and the application of specific quantitative or qualitative techniques.
Stage 6: Communicating findings	The researcher must communicate with stakeholders effectively. The conventional research method provides a written report that answers the specific research questions, defines the methodology, research design, data collection and analysis techniques, and offers the outcomes and key findings. However, due to the increasing demands on managers' time, researchers have realised that they must employ alternate methods in addition to reports, which stakeholders might never be able to read.

Sources: Adapted from Malhotra et al. (2017)

5.3.2 Problem definition

As stated in Chapter One, the main objective of this study is to evaluate the factors influencing mobile banking apps' continuous use amongst Millennials and Gen Z. The study summarised these factors as follows:

1. To investigate personal factors and task technology fit on the adoption of mobile banking apps.
2. To investigate trust in mobile banking apps on adoption.
3. To investigate experiential and functional factors on expectation confirmation.
4. To determine the influence of expectation confirmation, mobile banking app adoption and social response on mobile banking app satisfaction
5. To investigate mobile banking app satisfaction on continuous use
6. To assess artificial intelligence features on trust and social response in mobile banking apps.

The study's initial four chapters included a comprehensive review of the most recent marketing literature. The study aims to comprehend the efforts made by the banking industry to create mobile banking applications that are not only useful and practical, but also adaptable to the impact of artificial intelligence characteristics, as well as personal, practical, and experience factors. The prevalence of clutter within mobile banking apps has been identified as a pervasive issue. Remarkably there is a dearth of research focused on measuring the factors that impact the continuous use of mobile banking apps specifically among Millennials and Gen Z within the South African banking sector.

Given this vacuum in the literature, the study is a ground-breaking attempt to establish the foundation for comprehending South Africa's Millennials and Gen Z's continuous usage of mobile banking apps with this in mind, it aims to offer a framework that considers the distinct needs and preferences of Gen Z and Millennials, so promoting a rich understanding of the variables impacting the ongoing acceptance and utilisation of mobile banking apps in South Africa.

5.3.3 Critical literature review

The study's approach to identifying relevant literature incorporated a broad sampling frame covering various academic disciplines such as marketing, business psychology and computer science. The process of determining the literature aligns with the interdisciplinary nature of the study. The literature used in the study was retrieved using a process consisting of the following five steps:

Step 1: Finding the pertinent central themes for the study was the first step in the literature retrieval procedure. (Garg, 2019).

Step 2: The second phase was identifying keywords to describe the phenomenon of interest (Hartmann et al., 2019; Kumar & Srivastava, 2020; Liébana-Cabanillas et al., 2019). These terms included mobile banking, South African banks, Millennials, Gen Z, the banking industry, and mobile banking apps.

Step 3: The third step involved combining the three key terms with each central idea while searching various databases. (Barbosa et al., 2020; Karjaluoto et al., 2019).

Step 4: The key inclusion criterion was to look at literature that dealt with mobile banking apps (Dahlberg et al., 2020; Durkin et al., 2019). The researcher reviewed the abstracts for a fast overview in the fourth phase.

Step 5: The search process included looking through each article's references to find any additional studies that might be pertinent (Garg, 2019; Liébana-Cabanillas et al., 2019).

5.3.4 Generation of Hypotheses

A hypothesis has been given several different definitions. According to Fraenkel, Wallen, and Hyun's definition from 2019, a hypothesis is "a question that research aims to answer by outlining the expectations the study intends to find." According to scholar Bryman (2019), a hypothesis is a "proposed solution to a research problem that has not yet been validated." As defined by Creswell (2019), a hypothesis is a prediction about the relationship between two or more variables. According to researcher Neuman (2019), a hypothesis is a claim that can be supported by evidence. A hypothesis is described as "a tentative response to a study issue" by Babbie (2019).

Hypotheses can be created and tested due to patterns in the data and relationships between categories (Creswell, 2019). Hypotheses are crucial for selecting the optimum research design, data collection techniques, and analytical approaches, according to Saunders et al. (2019). Additionally, according to Bryman (2019), hypotheses steer the research process by distilling the subject of study, laying out an appropriate research strategy, and suggesting methods for data collection. Similarly, Sekaran and Bougie (2019) assert that the most influential research technique and the kind of evidence needed to test hypotheses can both be defined by the hypotheses themselves. The procedure used by the study to generate hypotheses is shown in

Figure 18.



Figure 18: Hypothesis Generation Process

Source: Author

Many techniques for defining hypothesis testing have been used throughout the research. According to Hair et al. (2019), hypothesis testing is a crucial statistical technique used to confirm research hypotheses by analyzing if the available data support a particular population parameter. Saunders et al. (2019) point out that hypothesis testing allows researchers to infer information about a population from a sample of data, allowing them to generalize about a broader group. To determine whether a research hypothesis is plausible, Bryman (2019) emphasizes that hypothesis testing is crucial for guaranteeing the reliability and validity of research findings. Hypothesis testing, according to Sekaran and Bougie (2019), is a potent technique for evaluating research hypotheses and enables researchers to decide whether the facts at hand can support a study hypothesis.

According to Hair et al. (2019), formulating a null hypothesis—which holds that the variables under study have no meaningful relationship—and an alternative hypothesis—which suggests such a relationship—involves testing hypotheses. Field (2019) states that hypothesis testing necessitates choosing a significance level, which expresses the probability of discovering a significant result by chance. According to Hair et al. (2019), a test statistic is calculated throughout the hypothesis-testing process to determine how different the observed sample data are from the null hypothesis. The test statistic must be compared to a critical value based on the selected significance level and degrees of freedom, according to Bryman (2019), who points out that this is necessary for hypothesis testing. Sekaran and Bougie (2019) state that based on the computed test statistic and critical value, hypothesis testing enables researchers to make educated conclusions regarding whether to reject or fail to reject the null hypothesis. According to Field (2019), testing research hypotheses can be a valuable way to learn about the connections between various factors and reach relevant conclusions.

5.3.5 Research design

The study's research methodology is shown in Figure 20. The sampling design includes the target audience, which consists of South African Gen Z and Millennials who use mobile banking apps. Convenience sampling is the sampling technique used, with a sample size of 500. Previous studies and literature on mobile banking apps illustrate that in most studies, a sample size that ranges from 200-600 respondents is used (Koenait, Maziriri & Chuchu, 2021; Humbani & Wiese, 2019; Chigori, Viljoen, Ford & Cilliers, 2020). With the highly regulated banking industry, attaining banking data for Millennials and Gen Z mobile banking usage data

from the bank is impossible. Thus, the choice of a 500 sample size was guided by the primary literature as well as the regulatory constraints about banks.

The questionnaire design is a self-administered online survey with a measuring scale of between four and five items. The data collection technique used the following social media platforms; Facebook, Instagram, Twitter, LinkedIn, Whatsapp and email.

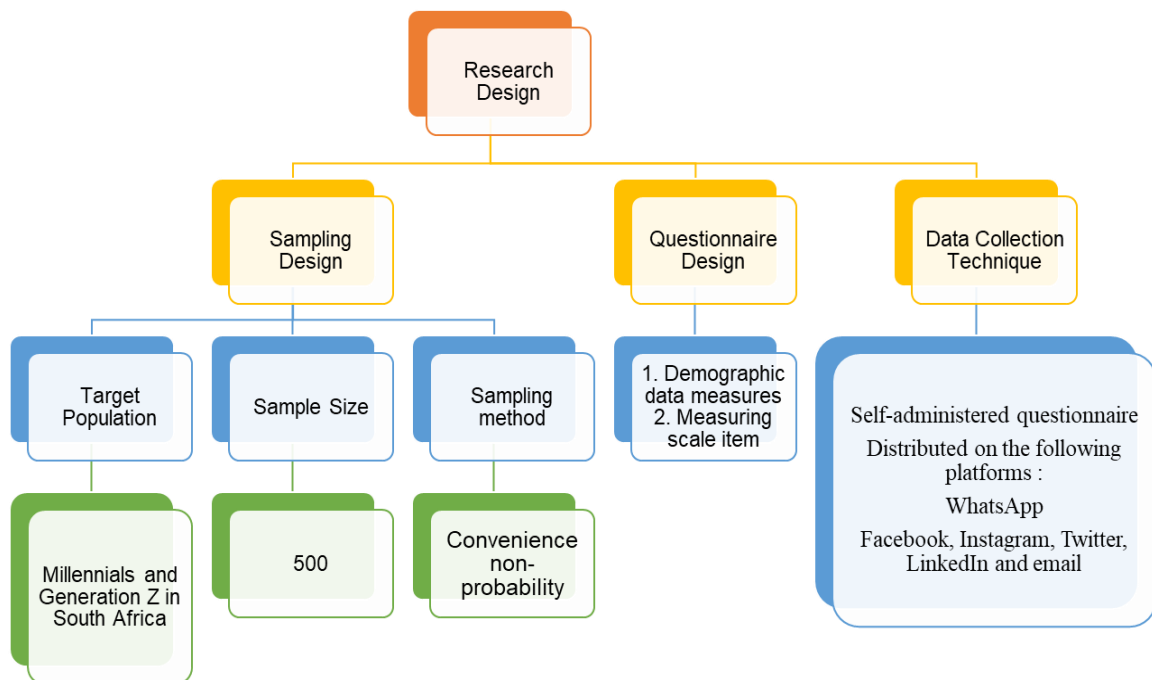


Figure 19: Research Design

Source: Author

5.3.5.1 The purpose of the study

This study investigates how artificial intelligence features and personal, experiential and functional factors influence mobile banking applications' continuous use among Millennials and Gen Z in South Africa. In fulfilling the study's mandate, the researcher will investigate each aspect and the impact it has on mobile banking applications' continuous use among Millennials and Gen Z in South Africa.

5.3.5.2 Research Strategy

The fourth layer of the research onion presents the research strategy. The research strategy describes how the researcher aims to conduct the work (Saunders et al., 2019). There are several research strategies, viz., Experimental design, Survey design, Archival research, Case study,

Ethnography, Action research, Grounded theory and Narrative inquiry (Saunders et al., 2019). Table 8 below summarises the various research strategies.

Table 8: Research Strategies

Research Strategy	Overview
Experiment	The experimental method involves the process of variable testing where the impact of one variable is on other variables. Similar to this accession, Malhotra et al. have opined that researchers examine cause-and-effect relationships among variables using this strategy.
Survey	The survey strategy is popular in social sciences and associated with the deductive research approach. This research collects strategy information through interviews or a pre-designed questionnaire.
Archival analysis	The archival strategy reports the incidence and prevalence related to a specific phenomenon. However, it isn't easy to use this strategy in research.
History	Researchers implement this research strategy to explore past issues. This strategy is adopted especially when no relevant person is alive to give the answer or to report about a particular subject.
Case study	The case study approach involves describing a situation or an issue in writing. It highlights a specific issue or poses minor group concerns. A case study is preferred when the researcher has minimal influence throughout events.

Sources: Adapted from Rahi (2017).

Various perspectives on a survey research strategy can be found in research. According to Bryman (2019), a survey research strategy entails gathering information from a sample of individuals using questionnaires or interviews. Sekaran and Bougie (2019) assert that survey research techniques can provide a detailed and accurate population representation if the sample is carefully selected. For acquiring quantitative data, the survey research technique is quite helpful. (Saunders et al., 2019). To gather data, the study has chosen to employ an online survey. A survey research approach can be used to assess a population's attitudes, opinions, and behaviours (Hair et al., 2019). Ensuring the questions used in a survey research approach are precise and unambiguous (Cooper & Schindler, 2019). A popular and effective way of performing marketing research is survey research (Hair et al., 2019; Malhotra & Birks, 2019).

It enables the collection of vast amounts of data from diverse respondents, resulting in a thorough understanding of consumer views, habits, and preferences (Malhotra & Birks, 2019). Furthermore, surveys are frequently less expensive and time-demanding than research approaches like focus groups or experiments (Kotler et al., 2019). The fundamental advantage of surveys is their capacity to quickly and cost-effectively collect enormous amounts of data from a large population (Hair et al., 2022). They are adaptable and can be used to research a variety of themes and challenges, including product preferences, brand recognition, and consumer happiness (Sharma et al., 2021).

One benefit of survey research is gathering information from a large and diverse population (Kotler et al., 2019). As a result, a sample representative of the target population is produced (Babbie & Mouton, 2018). Furthermore, survey research is cost-effective since it eliminates the need for travel and face-to-face interviews, which may be costly and time-consuming (Krosnick, 2018). It is also efficient because the data collection process may be automated and handled online, eliminating the need for manual data entry and coding (Couper, 2017). Another advantage of survey research is that it gives respondents anonymity, allowing individuals to share their thoughts without fear of censure or retaliation (Tourangeau, Rips, & Rasinski, 2017). This can lead to more accurate and honest responses, resulting in more valid and dependable data (Krosnick, 2018).

Due to their accessibility, affordability, and capacity to reach a vast audience, online surveys have grown in popularity (Kumar, 2019). Online questionnaires can be disseminated more swiftly and conveniently, and respondents can complete them whenever it suits them (Kotler et al., 2019). Additionally, online surveys provide more freedom regarding question kinds, response possibilities, and skip patterns, enabling the creation of more intricate survey designs (Malhotra & Birks, 2019). Survey research does have some restrictions, though. Low response rates may produce a biased sample (Kotler et al., 2019). To ensure that survey questions are accurate and valid assessments of the relevant constructs, thorough design and testing must also be done (Hair et al., 2019).

5.3.5.3. Time horizon

The fifth layer of the research onion displays the time horizon. According to Saunders et al. (2019), the time horizon serves as the framework for the study's anticipated completion date.

Two time periods are identified in the study Onion (Saunders et al., 2019): cross-sectional and longitudinal. Table 9 provides a more detailed summary of the time horizon.

Table 9: Time Horizon

Time Horizon	Overview
Cross-sectional	The researcher gathers data at a particular point, making the cross-sectional time horizon the snapshot time collection (Flick, 2011). At a certain time, the researcher is looking at a specific phenomenon.
Longitudinal	The term "longitudinal time horizon for data collection" describes the process of gathering data periodically over a long period. When evaluating change through time is a crucial component of the research, it is used by researchers (Goddard & Melville, 2004). Additionally, it gives the factors under inquiry some degree of control.

Source; Adapted from Saunders et al. (2019)

The time horizon, which represents the length of the research project and the time frame in which the study is conducted, is a crucial component of the research process. The time horizon affects the kinds of data that can be gathered and the techniques that may be applied for data analysis, as stated by (Saunders et al., 2019). The research question and the objectives of the investigation will determine the time horizon (Bryman, 2019). Cross-sectional studies, which concentrate on a specific event at a particular time, may only need a shorter time horizon than studies that need longitudinal data, such as those that track changes over time (Sekaran & Bougie, 2019).

Additionally, studies that collect a lot of data, like national surveys, might need a longer time horizon. In contrast, smaller-scale studies that concentrate on populations or contexts might benefit more from a shorter time horizon (Denzin & Lincoln, 2018). Additionally, practical factors like financial restrictions and the availability of resources, such as research workers and technology, may impact the time horizon (Creswell, 2019). The research strategy may also affect the time horizon because various research approaches may call for different time horizons. To allow for a more thorough examination of the research topic, qualitative research methods like ethnography and case studies frequently involve longer time horizons (Creswell,

2019). The validity of the study findings may necessitate a shorter time horizon for quantitative research techniques like experiments and surveys (Bryman, 2019).

A key component of the research onion is the time horizon, which influences the approaches for data collection and analysis as well as the overall research design. Researchers should carefully consider the time horizon while designing their investigations to ensure they are appropriate for the research topic and aims (Saunders et al., 2019). The study's cross-sectional time horizon was chosen because there won't be much time for data collecting. The selected period is unrelated to the research technique or methodology (Saunders et al., 2019).

5.3.5.4 Measurement and measures

The online survey questionnaire comprised sections A and B. Section A required the respondents to complete the screening questions and to fill in their demographic information. Section B measured the following: trust in mobile banking apps, mobile banking app adoption, mobile banking app satisfaction, mobile banking app continuous use, perceived artificial intelligence, perceptions of service delivery, perceived anthropomorphism, perceived security, performance expectancy, task technology fit, gamification and mobile app interactive quality.

For this study, the measuring constructs were modified from those used in earlier research. As shown in the table below, the researcher measured the following variables on the item scales adapted from the relevant sources: A 5-point Likert scale was used for this investigation. The anchors were given from 1 (Strongly disagree) to 5 (Strongly agree). A Likert Scale, following Taherdoost (2019), enables respondents to express their level of agreement and disagreement with numerous assertions regarding an attitude, an item, a person, or an event. A five-point Likert scale was used since there were many possibilities, which increased the likelihood that responders would provide correct responses. The table below outlines the constructs that the study has adopted.

Table 10: Adopted Constructs

Construct	Item	Source	Number of instruments
Perceived Artificial Intelligence	5	Lee and Chen, (2022)	5 item scale

Perceptions of AI service delivery	4	Payne, Peltier and Barger, (2018)	4 item scale
Perceived Anthropomorphism	5	Lee and Chen, (2022) Moussawi and Koufari, (2019)	5 item scale
Social Response	5	Adam, Wessel and Benlian, (2021)	5 item scale
Perceived Security	4	Boonsiritomachai and Pitchayadejanant, (2019)	4 item scale
Performance Expectancy	4	Nyagadza, Muposhi, Mazuruse, Makoni, Chuchu, Maziriri and Chare, (2022) Boonsiritomachai and Pitchayadejanant, (2019)	4 item scale
Task Technology fit	5	Bere, (2018) Lin and Huang, (2008)	5 item scale
Gamification	4	Ciunova-Shuleska, Palamidovska-Sterjadovska, and Prodanova, (2022)	4 item scale
Mobile app interactive quality	4	Zhou Ashfaq, Yun and Loureiro, (2020) Joon Choi, and Sik Kim, (2013)	4 item scale
Mobile app service quality	5	Ashfaq, Yun, Yu and Loureiro, (2020)	5 item scale
Expectation confirmation	5	Shin (2019)	5 item scale
Trust in mobile banking app	4	Lee and Chen, (2022)	4 item scale
Mobile Banking app adoption	4	Rahi, Ghani, Alnaser, and Ngah,, (2018)	4 item scale
Mobile banking app satisfaction	4	Shin, (2019) Haq and Awan, (2020)	4 item scale

Mobile banking app continuous use	4	Ukpabi, Karjaluoto, Olaleye and Abass, (2018) Zhou, Lu and Wang, (2010)	4 item scale
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Source: Adapted from various scales as indicated in the table.

5.3.5.5 Development and pre-testing of the questionnaire

The researcher created a pilot questionnaire and converted it to Google Forms to assess the validity of the data. Thirty participants received the pilot questionnaire from the researcher. Developing a questionnaire is an essential stage in survey research (Bryman, 2019). The questionnaire must be pre-tested for survey research to yield higher-quality data (Dillman, Smyth, & Christian, 2019). Pilot testing the questionnaire is a great way to identify potential problems and enhance the validity and reliability of the data (Saunders et al., 2019). Researchers may ensure respondents can comprehend and react to their inquiries by pretesting. (Sekaran & Bougie, 2019).

The pilot testing approach should involve a diverse group of participants to ensure the questionnaire is appropriate for the target population (Babbie & Mouton, 2019). Researchers should take the date and technique of data collection into account while pre-testing the questionnaire (DeVellis, 2019). During the pre-testing phase, it is essential to obtain participant feedback to make the necessary changes to the questionnaire (Fink, 2019). Researchers should ensure validity and reliability before making the questionnaire available to the intended participants (Hair Jr. et al., 2019). Pre-testing helps researchers identify potential questionnaire biases (Maxwell & Cortada, 2019). Pre-testing is an iterative process involving making changes to the questionnaire and running it through further tests until it is ready for use (Creswell & Creswell, 2019). Pilot testing may also assess the data's authenticity and dependability (Sekaran & Bougie, 2019). Creswell and Creswell (2018) also suggest pilot testing to raise the calibre of data collection. Pilot testing can stop essential questions from being omitted or unnecessary ones from being included (Denscombe, 2018). Similarly, Robson (2016) argues that pilot testing can boost the effectiveness of data collection methods.

5.3.5.6 Ethical considerations

Before the University's ethical committee granted the ethical clearance, the researcher attended an ethical course requiring an assessment. Successful completion of the assignment warranted

the University's ethical committee to award the researcher a certificate to distribute the survey to potential participants. The researcher administers a pilot test to identify potential issues. According to Malhotra et al. (2017), a subgroup of possible participants is selected from the population and given the questionnaire as part of the pilot testing process to identify and address any possible problems.

5.3.5.7 Sampling design

Sampling is the process of choosing an appropriate sample for research purposes from a larger population (Kumar et al., 2019). Sampling design is the process of selecting a sample of the intended audience through decision-making. It includes making decisions about the sample size, sampling technique, sampling frame, and population (Kabir, 2019). Understanding the characteristics of the population is crucial for developing a successful sampling strategy (Majid, 2019).

5.3.5.7.1 Target population

The target population is the collection of individuals or entities that a research study or survey attempts to analyse or describe (Babbie, 2019). Establishing the target group in research is critical to ensuring that the study's findings may be extrapolated to the larger population of interest (Fink, 2019). The target audience can be identified using age, gender, occupation, income, level of education, and geography. In social science research, selecting and characterizing the target group is critical in evaluating the validity and trustworthiness of the research findings (Trochim & Donnelly, 2022). For example, if the study aims to research college students' attitudes regarding online learning, the target audience would be college students currently enrolled in an educational institution. It is also critical to verify that the sample chosen for the study represents the target population to obtain accurate and reliable results. Sampling methods such as probability sampling and stratified sampling can be used to ensure that the sample is representative of the target population (Gorard, 2019).

Additionally, the ethical concerns of defining the target group must be considered. The parameters used to determine the target population should not discriminate against or violate the rights of any particular group. Excluding specific ethnic or racial groups from a study, for example, would be unethical and would weaken the study's validity. (Lara-Cinisomo et al., 2019).

To summarise, establishing the target population is a vital stage in the study of social sciences, and it is critical to consider numerous elements, such as sampling methodologies and ethical considerations when doing so. Researchers can verify that their findings are valid, reliable, and applicable to a larger population of interest in this way. The study's target population consisted of South African Millennials and Gen Z users of mobile banking apps. Since the two groups are considered digital natives by research and mostly conduct their banking transactions on mobile devices, it was decided to concentrate exclusively on them.

5.3.5.7.2 Sampling method

Rahi (2017) defines a sampling frame as a framework from which a researcher selects a sample of the intended audience. Sampling is the process of picking a subset of a larger population that is statistically representative (Majid, 2018). Because sampling techniques determine whether study results represent a larger population, they are crucial to research design. 2019 (Fowler). Probability sampling and non-probability sampling are the two categories into which sampling techniques are divided (Creswell, 2019). By choosing participants randomly from a known population, probability sampling techniques ensure that every member of the population has an equal chance of being picked for the study (Babbie, 2019). Standard probability sampling techniques include simple random sampling, stratified random sampling, and cluster sampling 2019 (Bryman). With this sampling method, each unit or population subject has an equal chance of being chosen. Random selections are used to choose the samples (Etikan & Babtope, 2019). Because the sampling units are equally representative, probability sampling is regarded as the best type of sampling (Pace, 2021).

On the other hand, non-probability sampling techniques do not include the random selection of participants from a known population and, as a result, do not ensure the representativeness or generalisability of study findings (Creswell, 2019). Non-probability sampling techniques are typically used when the population is hard to define, or reach when the study is centred on a particular subject or group (Bryman, 2019). Non-probability sampling techniques include convenience, purposeful, and snowball sampling (Babbie, 2019). This sampling technique means that there is no equal chance or probability of selection for any given object or experiment (Etikan, Sulaiman Abubakar, Rukayya Sunusi, 2016). Etikan and Babtope (2019) have observed that a skewed selection process leaves subjects and units vulnerable to bias and

other types of selection errors. Each sampling technique has benefits and drawbacks, and the choice of technique depends on the population, the research question, and the available resources (Creswell, 2019). It is crucial that researchers thoroughly assess the sampling technique in their study design and present it honestly in their research publications (Gravetter & Forzano, 2019).

The study's design necessitates the use of quota sampling. The study would need to consider all banks' market share, but from a digital perspective, employing quota sampling. Although all banks have a market share, they also think consumers conduct online and in-person business at physical locations. This study used a practical sampling strategy as a result. FNB was recognised as the greatest digital bank in South Africa by InSites-Consulting, which conducted a customer satisfaction study in June 2020. Sixth place went to Capitec, TymeBank, Nedbank, Standard Bank, and Absa Bank (Venter, 2020). Additionally, consumers appear to be drawn to Capitec and FNB's digital banks the most while consumers of Standard Bank, Absa, and Nedbank were more likely to transfer to FNB or Capitec than to other banks (BrandsEye, 2020c). It follows that the majority of participants will probably use FNB and Capitec's digital clients to perform their banking in a convenient manner (Venter, 2020).

5.3.5.7.3 Sample size

The sample size is essential in research design since it impacts the statistical power and precision of the study outcomes (Cohen, 2019). A sample that is too small may not represent the population and may lack the statistical ability to identify significant impacts (Krejcie & Morgan, 2019). In contrast, a too-large sample may squander money and time without adding much precision to the study results (Krejcie & Morgan, 2019). Several criteria, including the research topic, study design, sampling method, effect size, and alpha level, determine a study's sample size (Cohen, 2019). Power analysis, rule-of-thumb methods, and computer simulations are all methods for determining the sample size for a study (Krejcie & Morgan, 2019). Power analysis is calculating the smallest sample size required to detect a specific effect size with a given statistical power and alpha level (Cohen, 2019). Rule-of-thumb strategies, such as sampling 30 or 10% of the population, provide quick estimations of the minimal sample size but may not apply to all investigations (Krejcie & Morgan, 2019).

Computer simulations entail generating random samples from the population and calculating the statistical power and precision of study outcomes for various sample sizes (Cohen, 2019). In addition to identifying the appropriate sample size, researchers should mention the sample size calculation and any deviations from the planned sample size in their research publications (Gravetter & Forzano, 2019). Transparency in reporting sample size ensures the reproducibility and validity of the study outcomes (Simmons et al., 2019). The number of measuring items or constructs is one aspect that might guide the optimal sample size for a study, and this is an essential stage in research design (McNeish, 2018). Some recent studies have provided revised criteria for calculating sample size in investigations depending on the number of constructs or measurement items (Hair et al., 2019; Kline, 2016).

For studies involving up to five constructs, Kline (2016) recommends a minimum sample size of 100 participants, with an additional 20 participants for each additional construct. For studies with up to seven components, Hair et al. (2019) advise a minimum sample size of 100 participants, with a further 10 participants for each additional construct. These guidelines are predicated on the constructs exhibiting a moderate to strong association. Based on the number of measurement items inside each construct, other researchers have offered more precise guidelines for calculating sample size. For research with up to 20 items per construct, DeVellis (2017), for instance, recommends a minimum sample size of 100 participants plus an additional five participants for each other item.

For studies with up to five components, Wu et al. (2020), for instance, advise a minimum sample size of 200 participants, with an additional 50 participants for each additional construct. For studies with up to 10 measurement items per construct, they also advise a minimum sample size of 100 participants, with an extra 10 participants for each additional item. Fan et al. (2020) suggest a minimum sample size of 200 participants, plus 50 participants for each additional construct, for studies with up to six components. A minimum sample size of 10 participants is also advised for each assessment item within each construct. Van de Schoot et al. (2020) suggest a sample size determination power analysis approach that considers the estimated effect size, desired statistical power, and alpha level for the analysis.

Overall, these recent studies provide excellent information for establishing sample size in a study depending on the number of constructs or measurement items. However, additional aspects that may influence sample size determination, such as study design, data quality, and

demographic characteristics, should be considered by researchers. A sample size of 100 to 150 is sufficient to yield consistent results in SE (Teo, Milutinovi, & Zhou, 2016). Kyriazos (2018) states that SEM is a projected statistical method based on covariances, but when tested on tiny samples, it becomes unstable. Kyriazos (2018) has classified sample sizes into five categories: inadequate (50), fair (200), good (300), excellent (500), and outstanding (1000). A sample size of 200–600 respondents is typically employed in studies on mobile banking apps, according to prior research and literature (Koenait, Maziriri & Chuchu, 2021; Humbani & Wiese, 2019; Chigori, Viljoen, Ford & Cilliers, 2020). When a structural model is complex, contains numerous constructs, is not normally distributed, or the latent variable values will be utilised in subsequent analyses, it is advised to use PLS-SEM (Hair, Hult, Ringle & Sarstedt, 2017).

With the highly regulated banking industry, attaining banking data for Millennials and Gen Z mobile banking usage data is impossible. Thus, the choice of a 500 sample size was guided by the primary literature as well as the regulatory constraints of banks.. The sample size is a vital part of research design that requires careful thought and honest reporting to ensure statistical power, precision, and representativeness of study outcomes.

5.3.5.8 Data collection

Data gathering and processing are presented in the sixth layer of the research onion. This stratum is covered in the section below. Data collection is one of the most critical phases of performing research (Kabir, 2016). The systematic method of acquiring and analysing information on relevant variables to test hypotheses, analyse results, and respond to specified research objectives is known as data collection. According to Kabir (2016), the objective of any data-gathering endeavour is to procure superior quality information that may be transformed into extensive data analysis to provide a believable and persuasive answer to the raised issues. Numerous methods are employed by researchers to gather data. Observations in the field, case studies, interviews, ethnography, focus groups, oral histories, and projective techniques are a few examples of these methodologies. According to Parveen and Showkat (2017), questionnaires and interview plans are a couple of the data-collection instruments that were highlighted. Among the methods used to collect data are questionnaires and interviews (Parveen & Showkat, 2017).

The researcher used an online survey created using Google Forms to gather data for the study. The researcher disseminated the questionnaire via email and social media sites like LinkedIn, Twitter, Facebook, and WhatsApp. WhatsApp's minimal data usage and user-friendly interface make it one of the most popular communication platforms in South Africa, accessible to people from a wide range of socioeconomic backgrounds. Given people's high degree of familiarity and frequent usage, sending out the questionnaire over WhatsApp seemed anticipated to boost the survey response rates. The capability of WhatsApp to forge a snowball effect was one of the main benefits it being selected as a distribution channel. Following their receipt of the questionnaire, the initial respondents expanded the survey's reach by sharing it with their connections through direct messages or WhatsApp groups. Considering the demographics of WhatsApp users may be skewed towards particular age groups, economic levels, or metropolitan areas, using the app alone may result in sampling biases. To mitigate this, platforms such as Facebook, Instagram, LinkedIn, X and email were used to diversify the sample.

A screening question was added to the survey to ensure that only the appropriate persons responded. The researcher used screening questions to find potential study participants, specifically online bankers among Millennials and Gen Z. If they didn't utilise Internet banking, they couldn't complete the survey. A well-crafted questionnaire tries to involve respondents while making them feel the assignment is crucial (Dave & Suhayda, 2021). According to Mark et al. (2019), a standardised method of data collecting ensures that questions are designed clearly so that each participant understands them equally.

According to Nayak and Narayan (2019), formulating a questionnaire, distributing it to the sample population, storing the responses, and visualising survey results can be done online. Scholars Dave and Suhayda (2021) maintain that questionnaires are the most commonly utilised survey type precisely because of the following advantages:

- they are cost-effective,
- could be administered to a large number of people
- quick to administer,
- are subject to robust statistical analysis
- the researcher cannot lead the participant to provide a specific answer
- Respondents can complete the questionnaire in their own time.

5.3.5.9 Data analysis

Data integrity should first be achieved ahead of the data being analysed. Data integrity and analysis resolutions should not occur after collecting data (Malhotra et al., 2017). According to Malhotra et al. (2017), before raw data in questionnaires is subjected to statistical analysis, the researcher should convert it into a suitable form. This process will ensure that the output of the investigations will satisfy the research objectives set for a particular project (Malhotra et al., 2017). According to Malhotra et al. (2017), its integrity should be addressed before data can be analysed. The study will adopt the following process to fulfil the task of data integrity:

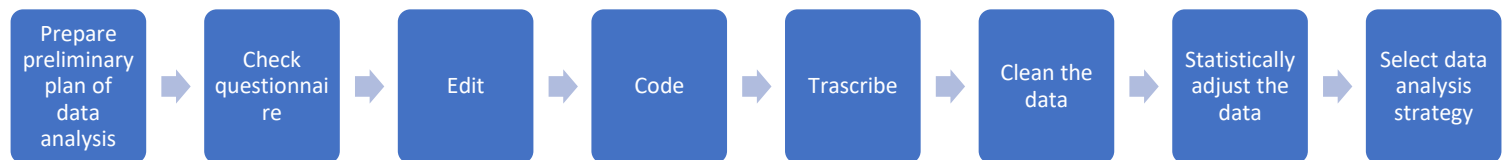


Figure 20: Data Analysis Process

Source: Malhotra et al. (2017).

Table 11 below explains the data integrity process flow described by Malhotra et al. (2017).

Table 11: Data Integrity Process

Process	Summary
Prepare a preliminary plan for data analysis.	The preliminary data analysis strategy created during the research design phase serves as the overall process's compass.
Check questionnaire	Researchers should perform checks while still in the field rather than just after data entry to ensure accuracy.
Edit	Reviewing the questionnaires for accuracy and precision is known as editing. It entails evaluating questionnaires to spot unclear, inconsistent, or unreadable responses. If responses are poorly recorded, they might not be legible. This is especially typical in

	surveys that contain many unstructured questions. If the responses are to be coded appropriately, they must be readable. Likewise, many degrees of questionnaire incompleteness are possible. There could be one or more unanswered questions.
Code	Many data entry and questionnaire design software programs automatically code data. The researcher's duty of learning these or even spreadsheet packages makes the coding procedure considerably easier. The days of data processing using "punched cards" are where many coding ideas have their roots. Most researchers benefit from a more straightforward, faster, and less error-prone method of data input that uses proprietary software packages, even though many data analysts might make compelling arguments for using original types of data entry.
Transcribe	Data transcription is entering the encoded information from the gathered questionnaires into computers. This step is not essential if the data were acquired online because they are already input into the computer as they are being gathered.
Clean data	Consistency checks and handling of missing responses are also parts of data cleansing. Although initial consistency checks were performed during editing, the computer-generated tests performed at this step are more rigorous.
Statistically adjust the data.	Scale transformation, variable specification, and weighting are all methods for statistically modifying the data. While not always essential, these modifications can improve the calibre of data analysis.
Select a data analysis strategy.	The earlier stages of the marketing research process, the known features of the data, the properties of statistical techniques, and the researcher's background and philosophy should all be considered when choosing a data analysis strategy.

Source: Malhotra et al. (2017).

According to Mark et al. (2019), before undertaking to prepare data for quantitative analysis, the researcher needs to be clear regarding the following:

- definition and selection of cases;
- data type or types (scale of measurement); and
- numerical codes used to classify data to ensure they will enable your research questions to be answered.

Data analysis generates relevant information to address the issue and promote sound decision-making (Malhotra et al., 2017). Confirmatory factor analysis (CFA), a type of structural equation modelling, compares observable measures or indicators to latent variables or factors to validate measurement models (Kline, 2019; Moore & Brown, 2019). Using CFA, the correlations between the pertinent variables were examined in this study. Furthermore, structural equation modelling was used to evaluate the proposed theoretical correlations between the independent and dependent variables (Schumacker & Lomax, 2019). The researcher was able to accept or reject the provided hypotheses by using equations created specifically for this study to determine the statistical significance of the association between variables. (Kline, 2016). After being first transferred into a Microsoft Excel spreadsheet, the data was sanitized. After that, it was moved to Smart PLS 4 and SPSS, two statistical programs, for analysis. The defined cut-off values were used to determine the fit indices after the CFA and structural equation modelling tests (Brown, 2019; Hair et al., 2019). The model's goodness of fit and suitability as a data representation was assessed using the fit indices, which provided us with a means of doing so.

5.3.5.10 Structural Modelling Equation

When there are several constructs, connections, and latent and observable variables, structural equation modelling (SEM) is increasingly being utilised (El Maalmi, Jenoui & El Abbadi, 2021). The two primary statistical analysis techniques that researchers may use are partial least squares (PLS-SEM) and covariance-based SEM (CB-SEM) (Dash & Paul, 2021). While CB-SEM is mostly used to validate theories, PLS is a causation–predictive method to SEM that emphasises prediction in estimating models, whose structures are supposed to provide causal explanations (Hair, Hult, Ringle, Sarstedt, Danks, Ray, Hair, Hult, Ringle, Sarstedt, & Danks, 2021).

Considering that PLS-SEM can estimate complicated models with multiple measurement constructs, indicator parameters, and structural routes, it is a popular choice among researchers

and does not require stringent distributive assumptions about the data (Cheah, Roldán, Ciavolino, Ting & Ramayah, 2021). When verifying measurement models, PLS-SEM is considered to be instrumental (Hair et al., 2021). PLS-SEM differs from other structural equation modelling (SEM) methods in that it prioritises being a causal-predictive approach. The structures are purposefully made to provide causal explanations, and this method of estimating statistical models places a premium on prediction (Sarstedt, Hair, Pick, Liengaard, Radomir & Ringle, 2022). One of PLS-SEM's most important benefits is that it can help close the gap between explanation, a critical component of academic studies and estimation, the foundation for delivering insightful management implications (Hair et al., 2019). This characteristic renders PLS-SEM especially advantageous in practical research environments because the focus is not only on comprehending the correlations between variables but also on forecasting and impacting outcomes in real-life scenarios (Cheah, Hair, Ringle, Sarstedt, Shmueli, Ting & Vaithilingam, 2019). By applying a causal-predictive perspective, PLS-SEM enables a comprehensive model estimating technique that is consistent with theoretical justification and real-world implementation (Hair, Matthews, & Matthews, 2018).

5.3.5.10.1 Measurement

PLS-SEM results are normally assessed by first examining the measurement models; various standards apply to formative and reflecting constructs (Hair et al., 2019). Researchers assess the structure of the model once the measurement models meet the necessary criteria (Hair et al., 2017a). PLS-SEM uses heuristics to understand model findings, just like other statistical techniques (Cheah et al., 2021; Hair et al., 2017a; Hair et al., 2019; Matthews, Hair & Matthews, 2018). A reliability criterion of at least 0.60 may be appropriate for exploratory research, but a reliability of 0.70 or higher is typically needed for studies that rely on established metrics (Hair et al., 2019). The final stage in deciphering PLS-SEM data is to perform a couple of resilience checks to confirm the result's reliability (Avkiran, 2018). Two elements that establish the importance of these checks in the context of the study are the goal of the analysis and the accessibility of the data (Richter, Hauff, Ringle & Gudergan, 2022). Robustness checks essentially act as a safety precaution, bolstering the validity and dependability of the acquired outcomes under various conditions (Avkiran, 2018).

5.3.5.10.2 Reflective Model Analysis

Reviewing the indicator loadings is the first step in a thorough investigation of a reflective measurement framework (Hair et al., 2019). When suggested loadings are greater than 0.708, indicating that the construct accounts for more than 50% of the indicator's variance, acceptable item dependability is guaranteed (Surve, 2023). The second phase involves evaluating the reliability of internal consistency, which is typically accomplished through the use of composite reliability (Hair, Hult, Ringle, Sarstedt, Danks & Ray, 2021). As seen below, larger values generally translate into higher reliability levels (Surve, 2023).

- 0.60 to 0.70 reliability scores are regarded as "acceptable in exploratory research."
- In the range of 0.70 to 0.90, values are regarded as "satisfactory to good."
- Item redundancy and possible problems with construct validity are indicated by values of 0.95 and above, which are troublesome.

An alternative metric for internal consistency dependability that yields lower values than composite reliability and employs equivalent thresholds is Cronbach's alpha (Ammad, Alaloul, Saad & Qureshi, 2021). Cronbach's alpha is not as accurate as composite reliability because it considers unweighted items, whereas composite reliability considers weighted items based on the individual loadings of construct indicators (Hair et al., 2019). True dependability of the construct is generally thought to lay somewhere in the middle of these two extremes, even though Cronbach's alpha is considered cautious and composite reliability progressive (Jumani & Sukhabot, 2021). This thorough investigation guarantees a thorough understanding of the validity and reliability of reflecting measurement models in PLS-SEM analysis (Hair et al., 2019).

Convergent validity analysis is the third phase in assessing a reflective measurement model. According to Kamis, Saibon, Yunus, Rahim, Herrera, and Montenegro (2020), this is measured by the degree to which the measurement construct convergence occurs to account for the variance among its elements. The average variance extracted (AVE) for each item on each measurement construct is used to assess convergent validity (Purwanto, 2021). A construct is said to account for at least half of the variation in the items when the AVE is 0.50 or higher (Purwanto, 2021). The degree to which a construct is empirically distinct from other constructs in the structural model is assessed in the fourth phase, known as discriminant validity assessment. A traditional metric was presented by Fornell and Larcker (1981), who suggested

comparing the AVE of each construct to the squared inter-construct correlation of all other reflectively measured constructs as well as the same construct. Nevertheless, current studies point to this metric's limits, especially in cases where indicator loadings on a construct are comparable (Hair et al., 2019).

As a substitute, Henseler et al. (2015) suggested calculating the correlations' ratio of heterotrait to monotrait (HTMT). When HTMT values rise significantly, problems with discriminant validity occur (Hair et al., 2019). For structurally comparable components, a threshold value of 0.90 is recommended; for highly dissimilar constructs, a lower threshold, such as 0.85, is advised (Nasidi, Ahmad, Dahiru & Garba, 2021). Bootstrapping is a method employed, according to Becker, Cheah, Gholamzade, Ringle, and Sarstedt (2023), to ascertain whether the HTMT value differs noticeably from 1.00 or a lower threshold value. Researchers can develop a statistical indicator of discriminant validity by determining if the largest value of the 95% HTMT confidence interval is less than 0.90 or 0.85 (Hair et al., 2019). These thorough procedures guarantee a thorough assessment of the validity and dependability of reflective measurement models when used in PLS-SEM analysis.

5.3.5.10.3 Formative

The convergence validity, measurement collinearity, statistically significant nature of the indicators, and significance of the indicator weights are the suggested standards for assessing formative measurement models in PLS-SEM analysis that incorporate formative constructs in the structural model (Hair et al., 2017).

5.3.5.10.4 Model adopted by the study

Reflective models make the theoretically expected assumption that latent constructs drive the observed variables (Hair et al., 2019). Internal consistency and dependability are improved by these models' capacity to capture unidimensional objects with highly correlated and interchangeable indicators (Hair et al., 2019). A strong framework for evaluating model fit is offered by reflective models, which also enable hypothesis testing of causal links between constructs. Furthermore, they consider measurement errors, enhancing the analysis's accuracy and validity. The study will therefore use reflective models.

5.3.5.10.3.1 Convergent Validity

Redundancy analysis is used to evaluate convergent validity for constructs measured formatively (Hair et al., 2019). Researchers could incorporate alternate reflectively assessed indicators of the same hypothesis in their survey (Abrumman, Omar, Al Shbail & Aldoghan, 2022). Usually, a separate measure that condenses the essential elements of the construct being studied into a single item is sufficient. According to Hair et al. (2019), a minimum correlation coefficient of 0.70 is recommended between the one-item construct measuring the same issue and the formally evaluated construct.

5.3.5.10.3.2 Collinearity Assessment:

The formative indicators' collinearity is assessed using the Variance Inflation Factor (VIF) (Jumani & Muhamad, 2023). Significant collinearity issues are indicated by VIF values of 5 or more, however, collinearity concerns can occur at smaller VIF values of 3 (Hair et al., 2019). Ideally, VIF values should be less than or around 3. (Hair et al., 2019; Jumani & Muhamad, 2023).

Key Indicator Weights and Significance:

- The statistical significance of the indicator weights must be assessed by researchers (Hair et al., 2019).
- Bootstrapping is used for significance testing, with BCa bootstrap confidence intervals recommended for skewed distributions (Wainaina, Bett & Njehia, 2021).
- An indicator weight may be removed if its confidence interval contains zero, indicating that it is not statistically significant (Kankaew, Yapanto, Waramontri, Arief, Hamsir, Sastrawati & Espinoza-Maguiña, 2021).

Alongside statistical significance, researchers should consider the indicator's relative significance to the construct, as shown by its outer loading (Jony & Serradell-López, 2021). Hair et al. (2017a) state that indicators with insignificant loadings and weights should be eliminated. Cautious removal of formative indicators is recommended due to the limits of formative measurement models, which include less statistically significant indicator weights and the requirement for indicators to completely capture the domain of the construct (Kankaew et al., 2021).

5.3.5.10.3.3 Indicator Relevance Examination:

Before examining an indication's applicability, researchers must assess its importance (Hair et al., 2020). Conventional indicator weights range from -1 to +1; nevertheless, tiny sample sizes or collinearity problems may lead to anomalous outcomes (Hair et al., 2019). Johan, Hussain, Mohd, and Kamaruddin (2020) argue that weights in the range between +1 and -1 indicate positive or negative significant associations, while weights close to 0 indicate a weak association. To sum up, the evaluation of formative measurement models in PLS-SEM involves a thorough examination of convergent validity, collinearity, statistical significance, and the applicability of indicator weights. Emphasis is placed on the unique characteristics and requirements of formative constructs (Hair et al., 2020).

When the measurement model assessment in PLS-SEM is deemed satisfactory, the structural model analysis takes precedence (Hair et al., 2019). The blindfolding verifies redundancy measure Q², the coefficient of reliability (R²), and the statistical significance of the results and application of the path coefficients are standard evaluation criteria (Ahn & Kwon, 2022). Additionally, researchers should evaluate the model's out-of-sample prediction performance using methods such as PLS prediction (Shmueli et al., 2016).

5.3.5.10.3.4 Collinearity Assessment:

Collinearity between predictor constructs should be evaluated, much as formative measurement models (Hair et al., 2020). In partial regression, latent variable results of the predictor components are used to calculate VIF values (Purwanto, 2021). Collinearity problems may arise at less VIF values of 3-5, with potential problems indicated by values over 5. (Hair et al., 2019; Hair et al., 2020). VIF values ought to be less than or near 3 (Purwanto, 2021). A possible remedy for collinearity is to develop higher-order models (Hair et al., 2020).

5.3.5.10.3.5 Explanatory Power (R²):

Researchers look at the endogenous construct(s)' R² value after establishing that there are no collinearity problems (Duc & Viet, 2022). According to Nasution, Fahmi, and Prayogi (2020), R² quantifies the variation explained in each endogenous component and reveals the explanatory capacity of the model. Greater values of R², which range from 0 to 1, indicate better predictive ability. R² values of 0.75, 0.50, and 0.25 are recommended as significant, reasonable, and inadequate, respectively, however, they vary depending on the context (Ahn

& Kwon, 2022). The study setting, previous studies, and models with comparable complexity should all be taken into consideration when interpreting R² (Duc & Viet, 2022). Elevated R² values could suggest overfitting; therefore, care should be taken to prevent fitting noise from taking the place of the population as a whole (Liengaard, Sharma, Hult, Jensen, Sarstedt, Hair & Ringle, 2021).

5.3.5.10.3.6 f² Effect Size:

The f² effect size allows researchers to evaluate how the elimination of a predictive construct impacts the values of the R² value of an internal construct (Tinali, 2021). It gauges how much R² varies when a predictor is eliminated, offering information about the predictive constructs' applicability (Nasution et al., 2020). According to Hair et al. (2019), values greater than 0.02, 0.15, and 0.35 indicate minor, medium, and large effect sizes, respectively.

5.3.5.10.3.7 Q² Value:

Q², based on the blindfolding procedure, assesses the PLS path model's predictive accuracy (Hair et al., 2019). It evaluates how well the model predicts the endogenous constructs out-of-sample (Duc & Viet, 2022). These assessment criteria collectively provide insights into the model's explanatory power, the impact of predictor constructs, and its predictive accuracy (Tinali, 2021). Researchers should interpret results contextually and consider the complexity of the model and its potential implications for overfitting (Liengaard et al., 2021).

In the final step of the model assessment, after substantiating the model's explanatory and predictive power, researchers need to evaluate the statistical significance and relevance of the path coefficients (Hair et al., 2019). Similar to how the formative indicator weights are interpreted, so are the path coefficients. These are the primary actions that need to be taken:

Bootstrapping for Significance Testing:

- According to Wainaina et al. (2021), researchers must employ bootstrapping to evaluate the statistical significance of the path coefficients.
- Following Kankaew et al. (2021), bootstrapping is a resampling approach that aids in predicting the sampling distribution of a statistic. This enables researchers to construct confidence intervals and test hypotheses (Kankaew et al., 2021).

5.3.5.10.3.8 Interpretation of Path Coefficients:

According to Cheah et al. (2020), path coefficients show the direction and strength of interactions between the structural model's constructs. In general, these coefficients lie between -1 and +1; negative values signify a bad relationship, positive values suggest a good association, and the magnitude denotes the strength of the relationship (Hair et al., 2020).

5.3.5.10.3.9 Evaluation of Construct Indirect Effects:

Researchers may deduce a construct's indirect influence on a particular construct by using one or more intervening constructs (Hair et al., 2020). When evaluating mediating effects, which entails knowing how one variable influences another through a mediator variable, this kind of effect is especially pertinent (Gaskin et al., 2023).

5.3.5.10.3.10 Relevance of Path Coefficients:

Beyond statistical significance, researchers should also evaluate the relevance or practical importance of the path coefficients (Becker et al., 2023). While statistical significance indicates whether an effect is likely to be present in the population, relevance considers the magnitude and practical significance of the effect in the real-world context (Hair et al., 2020).

5.3.5.10.3.11 Consideration of Mediating Effects:

Mediating effects occur when the relationship between an independent variable and a dependent variable is influenced by an intervening variable (mediator) (Sobaih & Elshaer, 2022). Researchers should assess the indirect effects of constructs on target constructs through mediating constructs, contributing to a more nuanced understanding of the model (Danks, 2021). By conducting bootstrapping for significance testing, interpreting path coefficients, evaluating construct indirect effects, considering the relevance of coefficients, and accounting for potential mediating effects, researchers can provide a thorough and insightful assessment of the structural model concerning their study (Gaskin, Ogbeibu & Lowry, 2023).

The elucidation of fit indices in SEM is pivotal to discerning the congruence between theoretical models and empirical data. Having presented a comprehensive discussion of fit indices within the context of SmartPLS analysis, the table below serves to contextualise the significance of these metrics and their interpretive implications. Fit indices, serving as evaluative benchmarks, play a critical role in validating the fidelity of the hypothesised model,

providing researchers with quantitative insights into the model's adequacy and the coherence of its underlying constructs.

Table 12: Fit Indices

Fit indices	Acceptable value
Reflective indicator loadings and Internal consistency reliability - Cronbach's alpha c	>0.708
Convergent validity AVE	> 0.50
Discriminant validity	For conceptually similar constructs: HTMT < 0.90 For conceptually different constructs: HTMT < 0.85 Test if the HTMT is significantly lower than the threshold value
Formative measurement models Convergent validity (redundancy analysis)	>0.70 correlation
Collinearity (VIF)	Probable (i.e., critical) collinearity issues when VIF >5 Possible collinearity issues when VIF > 3-5 Ideally show that VIF < 3
Structural model Collinearity (VIF)	Probable (i.e., critical) collinearity issues when VIF >5 Possible collinearity issues when VIF > 3-5 Ideally show that VIF < 3
R squared value	R2 values of 0.75, 0.50 and 0.25 are considered substantial, moderate, and weak. R2 values of 0.90 and higher are typically indicative of overfit
Q squared value	Values larger than zero are meaningful Values higher than 0, 0.25 and 0.50 depict small, medium, and large predictive accuracy of the PLS path model.

Source: (Hair et al., 2019)

5.4 RATIONALE FOR USING SMART PLS

SmartPLS stands out as a flexible tool suited for quantitative research in dynamic contexts. Its adaptability accommodates the exploration of intricate relationships and variables related to

continuous mobile banking app use among Millennials and Gen Z. SmartPLS employs the PLS algorithm, ideal for handling complex latent variables models and intricate relationships. This is crucial for capturing the multifaceted nature of variables influencing continuous mobile banking app use. This research involves nuanced relationships and potential mediating factors. SmartPLS integrates bootstrapping techniques, enabling the derivation of robust statistics, standard errors, and confidence intervals. This ensures the validity and statistical rigour of the study's findings. SmartPLS supports the creation of composite models, allowing for a holistic understanding of the relationships among constructs. This aligns with the study's quantitative nature, enabling a comprehensive exploration of factors influencing continuous mobile banking app use. The study draws upon multiple theoretical frameworks to capture the intricate dynamics of mobile banking app usage. SmartPLS facilitates the seamless integration of these frameworks, providing a unified quantitative framework for analysis. SmartPLS emerges as the quantitative research tool of choice for investigating continuous mobile banking app use among South Africa's Millennials and Gen Z. Its adaptability, methodological strengths, predictive capabilities, and compatibility with complex models position it as the ideal instrument for deriving quantitative insights. The study, empowered by SmartPLS, aims to contribute quantifiable knowledge to the academic discourse while offering practical implications for financial institutions adapting to the digital preferences of the targeted demographic.

5.5 CONCLUSION

To illustrate the approaches, procedures, ideologies, methodologies, and techniques used in the investigation, the study adopted the research onion model. The research approach was described in this chapter. The study employed a positivist paradigm and a quantitative deductive technique to test and validate the hypothesis. The study used an online questionnaire survey method suitable for a cross-sectional study in which participants are only contacted once (Nayak & Narayan, 2019). The study also upheld ethical standards, including participant anonymity, informed consent, and confidentiality. All participants provided their informed consent before the survey after learning about the study's objectives and the significance of their voluntary participation. The confidentiality of the participant's responses was preserved by deleting all identifying information from the data gathered. No identifying information was gathered during the survey to safeguard participants' anonymity. The online survey technique

was suitable for a cross-sectional study design, where the researcher only collected data from the participants once. This design aims to capture a snapshot of a particular population at a specific time. Using this approach, which tries to capture a moment in time for a specific population, the researcher can study the connections between relevant factors.

The culmination of this chapter signifies a thorough exploration and critical analysis of the application of SmartPLS 4.0 in the realm of structural equation modelling (SEM). The convergence of theoretical foundations and practical implementation has unveiled several key insights, underscoring the significance of this research endeavour within the broader academic landscape. The use of SmartPLS 4.0 in research empowers researchers to conduct sophisticated and rigorous analyses. Its versatility, coupled with its advanced features, positions it as a valuable tool for researchers seeking to unravel complex relationships within the data. The symbiotic relationship between theoretical exploration and practical implementation, facilitated by SmartPLS 4.0, propels the research's academic inquiry forward. As we transition to subsequent phases of this research endeavour, the insights gleaned from this chapter lay the foundation for a robust and contributory scholarly undertaking. The following chapter will cover the data analysis procedure and the findings from the online survey questionnaire the researcher to examine the relationships between variables of interest.

CHAPTER 6: PRESENTATION OF RESULTS

6.1 INTRODUCTION

Research design, data gathering techniques, and data analysis procedures were all covered in great detail in chapter five. With a focus on the variables impacting Millennials and Gen Z's continuous use of mobile banking apps in the South African banking market. This chapter analyses the findings from the gathered data. The demographics section of the study covers the participants' gender, income level, age, and educational attainment. This section also looks at any noticeable differences in the utilisation of mobile banking apps among South Africa's Millennials and Gen Z. The second section focuses on the metrics used to measure the variables influencing the consistent utilisation of mobile banking apps, such as AI factors, social response, personal factors to adoption, experiential factors, expectation confirmation and mobile banking app curation factors. These are based on the analyses conducted in the software programs IBM SPSS Statistics and Smart-PLS 4. The chapter emphasises the role that mobile banking app curation plays in Millennials' and Gen Z consumers' patterns of client retention.

The results of the hypothesis testing, which aimed to determine the link between the measuring constructs utilised in the study, are presented in the third section. This section discusses the primary factors influencing Gen Z and Millennials' ongoing usage of mobile banking apps in the South African banking industry. It emphasises that selecting mobile banking apps wisely can boost consumer satisfaction and loyalty. This chapter examines the variables that drive Millennials and Gen Z to continuously utilise mobile banking apps in-depth. The study's findings should broaden our understanding of how mobile banking applications are used and how consumers are retained. The findings should also provide practitioners with helpful guidance on how to develop strategic plans for these applications.

6.2 DESCRIPTIVE STATISTICS

The study's complete examination of the participants' demographic traits is provided in this section. It covers the consistent utilisation of mobile banking apps concerning gender, age, income, place of residence, and educational background. Data from a sample of South African

Millennials and Gen Z members who have used mobile banking apps were gathered for the study.

6.2.1 Demographic Profile of Respondents

6.2.1.1 Gender

The gender distribution of survey participants who took part in the study is displayed in Figure 22.

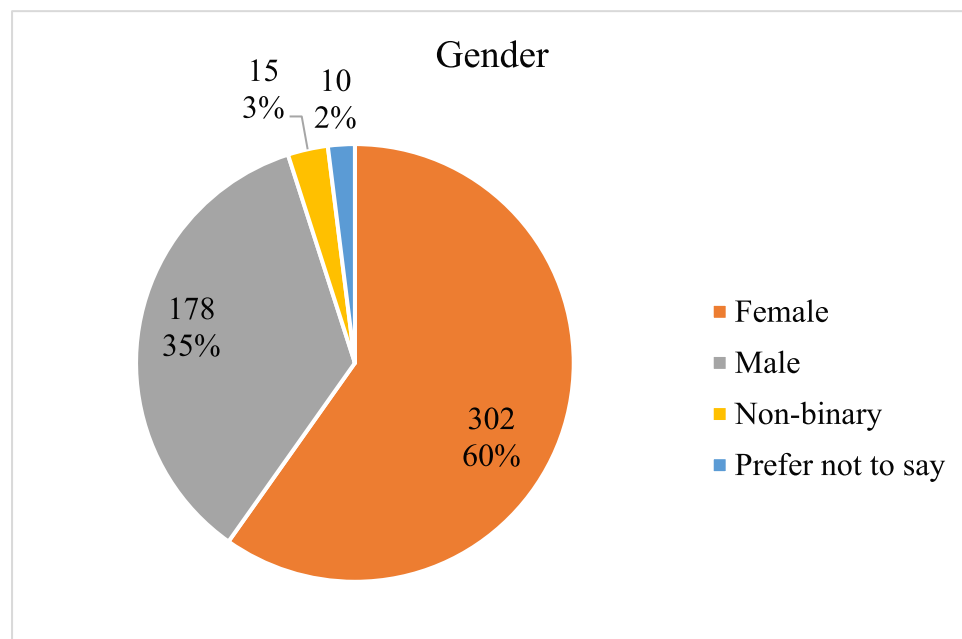


Figure 21: Gender

Source: Researcher's compilation (2023)

According to the study's findings, women (59.80%) and men (32.25%) made up the majority of respondents, followed by those who indicated they would "prefer not to say" (1.98%). According to past research, women are frequently more likely than men to participate in surveys and research studies (Becker, 2022). This gender distribution is consistent with those findings. Several reasons could influence the survey's preponderance of female respondents. According to Becker (2022), one possibility could be that more women than men were invited to participate in the study. Another argument is that women are often more eager and enthusiastic about participating in surveys and research studies than males are, according to Egan, Otufowora, Liu, Young, Varma, Striley, and Cottler (2021). The mid-year population for 2021, as predicted by Statistics South Africa (Stats SA), was 60,14 million people. 48.9% of the population is male, and 51.1%, or around 30,75 million, are female (Statistics South

Africa, 2021). This suggests that there are marginally more women than men in the population, which could help explain why more women than men were participating in the study.

6.1.1.2 Generation

Figure 23 displays the monthly income profile of the study's participants.

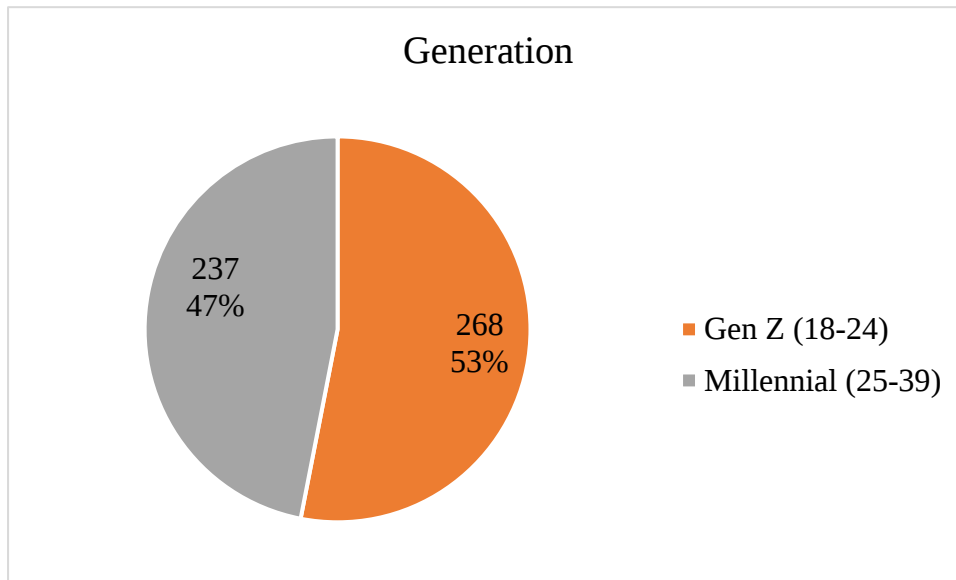


Figure 22: Generation

Source: Researcher's compilation (2023)

The majority of respondents (53%) were between 18 and 24, as shown in Figure 23. The remaining responders (47%) were between 25 and 39. People between the ages of 18 and 24 have always had easy access to the Internet (Dolot, 2018). The substantial percentage of respondents between 18 and 24 is consistent with a previous study that found that younger people use the Internet more frequently (Persada et al., 2019). According to Szymkowiak, Melovi, Dabi, Jeganathan & Kundi (2021), several factors, such as technological comfort, free time, higher education, and income levels, could account for this.

6.1.1.3 Number of Banking Accounts

Figure 24 depicts the number of banking accounts of the respondents who participated in the survey.

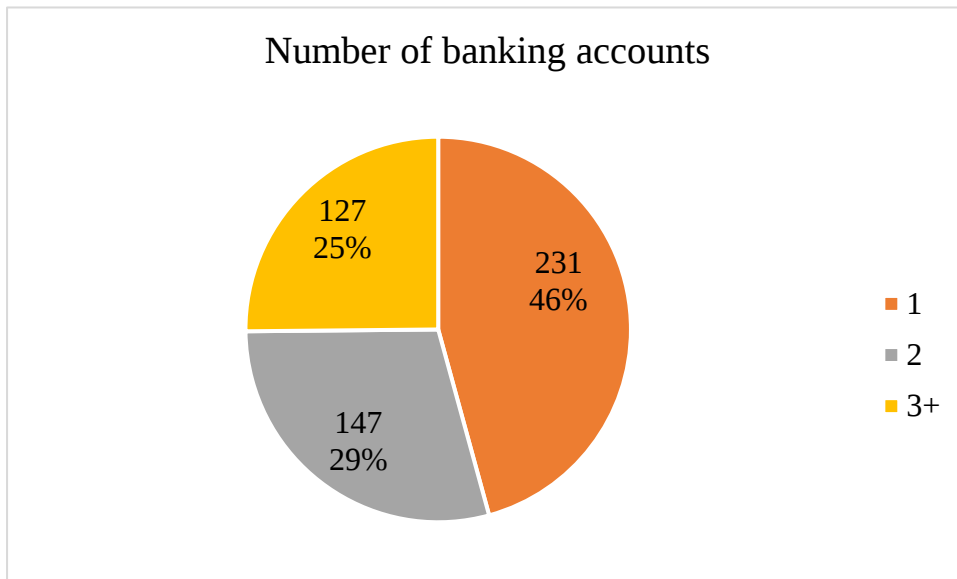


Figure 23: Number of Banking Accounts

Source: Researcher's compilation (2023)

The findings displayed in Figure 23 demonstrate the variation in the number of banking accounts held by survey respondents. As mentioned, 46% (231) of respondents have only one banking account, while 29% (147) have two banking accounts. Furthermore, 25% (127) of respondents reported having over three banking accounts.

6.1.1.4 Number of Mobile Banking Apps

A breakdown of the number of banking applications submitted by survey participants is shown in Figure 25.

Figure 24: Number of Mobile Banking Apps

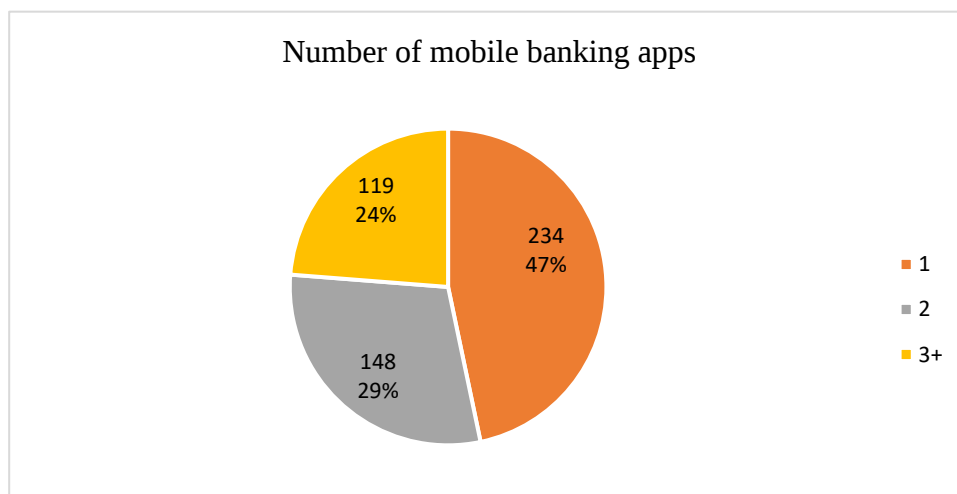


Figure 25 reveals how the survey respondents' usage of different mobile banking apps varies. As previously indicated, 29% (148) of respondents have mobile banking apps, compared to 47% (234) with just one. Additionally, 24% (119) of the respondents used three or more mobile banking apps.

6.1.1.5 Monthly Income

Figure 26 shows the monthly income profile of the survey respondents.

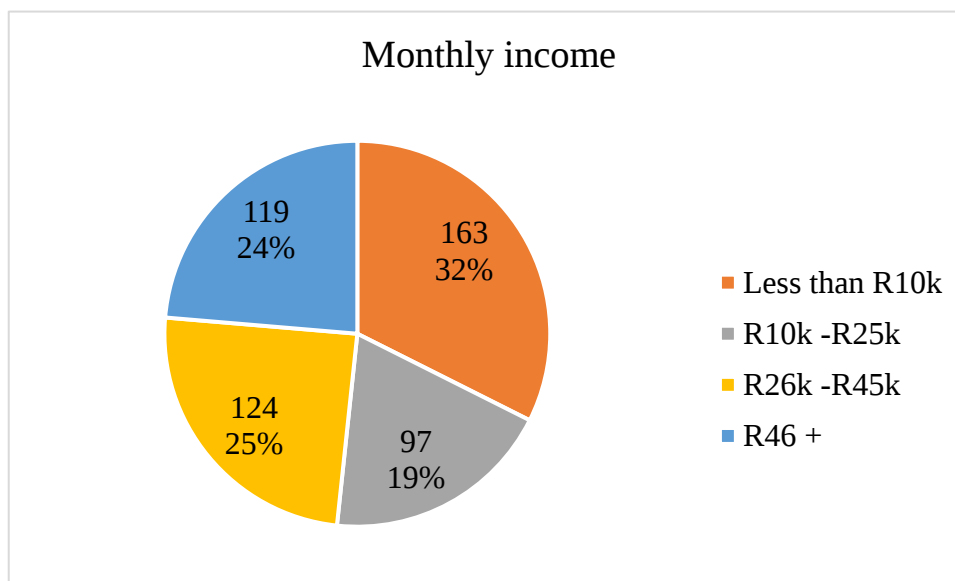


Figure 25: Monthly Income

Source: Researcher's compilation (2023)

Figure 26 illustrates the variations in the monthly income profiles of the participants in the study. As mentioned, 32% (163) of respondents earned less than R10,000 monthly, while 19% (97) earned between R10,000 and R25,000 monthly. Furthermore, 25% (124) of respondents reported earning between R26,000 and R45,000 monthly, while 25% (119) reported earning R46,000 or more monthly.

6.1.1.6 Education levels

Figure 27 depicts the education levels of the respondents who participated in the survey.

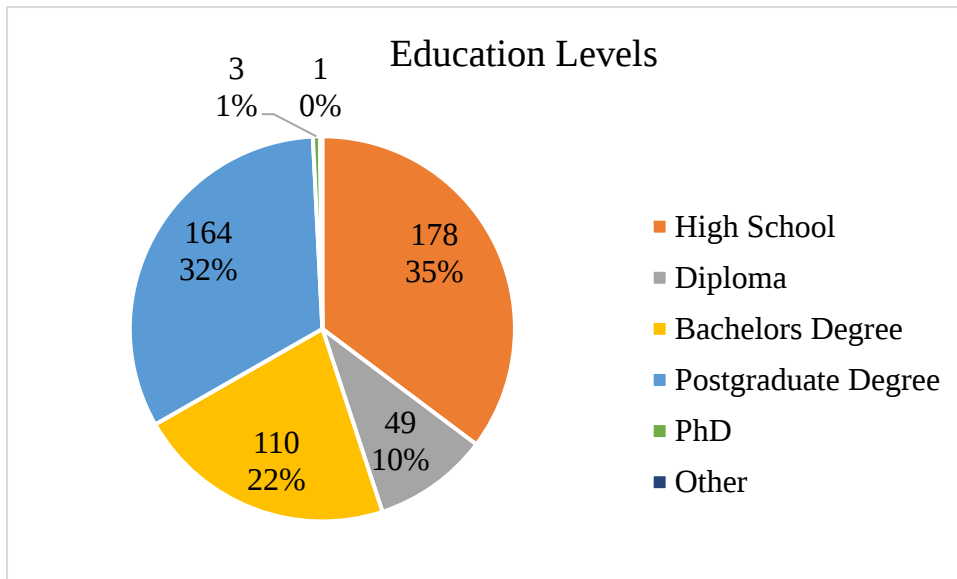


Figure 26: Education Levels

Source: Researcher's compilation (2023).

According to the data in Figure 27, 35% (178) of the 505 consumers said they had only completed high school, while 32% (164) said they had a postgraduate degree. Those who said they had a Bachelor's degree made up 22% (110), whereas 10% (49) said they had a Diploma, and 1% (3) said they had a PhD. The remaining 0% (1) of participants did not indicate their education level.

6.1.1.7 Summary of demographic profile

Table 13: Summary of Demographic Profile

Demographic characteristic		Frequency	Percentage
Gender	Female	302	60
	Male	178	35
	Non-binary	15	3
	Prefer not to say	10	2
	Total	505	100
Generation	Gen Z (18-24)	268	53
	Millennial (25-39)	237	47
	Total	505	100
Education level	High School	178	35

	Diploma	49	10
	Bachelors Degree	110	22
	Postgraduate Degree	164	32
	PhD	3	1
	Other	1	0
	Total	505	100
Province	Gauteng	475	94
	Free State	1	0
	KwaZulu Natal	1	0
	Limpopo	0	0
	Eastern Cape	4	1
	Northern Cape	0	0
	North West	9	2
	Mpumalanga	2	0
	Western Cape	13	3
	Total	505	100
Monthly Income	Less than R10k	163	32
	R10k -R25k	97	19
	R26k -R45k	124	25
	R46 +	119	24
	Missing	2	0
	Total	505	100
Number of banking accounts	1	231	46
	2 +	147	29
	3 +	127	25
	Total	505	100
Number of mobile banking apps	1	234	46
	2 +	148	29
	3 +	119	24
	Missing	4	1
	Total	505	100

Source: Researcher's compilation (2023)

6.2.2 Construct means and corresponding standard deviations

The construct means, and accompanying standard deviations are described in this section.

6.2.2.1 Perceived Artificial Intelligence (PI)

Table 14: Perceived Artificial Intelligence

Measurement Item	Mean	SD	1	2	3	4	5	Total
PI1: Mobile banking apps can help me to complete banking transactions quickly.	4.9	.511	7 1.4%	0	1 0.2%	21 4.2%	476 94.3%	505 100%
PI2: The mobile banking app can understand my instructions.	4.87	.445	2 0.4%	1 0.2%	7 1.4%	39 7.7%	456 90.3%	505 100%
PI3: Mobile banking apps can communicate with me in a way that I understand.	4.86	.491	4 0.8%	0	6 1.2%	44 8.7%	451 89.3%	505 100%
PI4: Mobile banking apps are able to set and pursue tasks automatically in anticipation of my future needs.	4.76	.710	5 1.0%	9 1.8%	24 4.8%	26 5.1%	441 87.3%	505 100%
PI5: Mobile banking apps can adapt their behaviour based on prior events.	4.75	.710	4 0.8%	11 2.2%	23 4.6%	30 5.9%	437 86.5%	505 100%
Total	4.83	.486						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The participants' level of agreement with the assertions was indicated by the total mean (4.83) and standard deviation (.486). 94.3 % of the participants strongly agreed mobile banking apps can help them to complete banking transactions quickly, and 4.8 % neither disagreed nor agreed that mobile banking app apps can perform tasks automatically ahead of future needs. In

comparison, 10.2% strongly disagreed that mobile banking app can understand their instructions.

6.2.2.2 Perceptions of AI service delivery(PSD)

Table 15: Perceptions of AI Service Delivery

Measurement Item	Mean	SD	1	2	3	4	5	Total
PSD1: I would enjoy using Artificial Intelligence.	4.77	.633	4 .8%	5 1.0%	17 3.4%	52 10.3%	427 84.6	505 100%
PSD2: I think that Artificial Intelligence is essential.	4.79	.598	2 .4%	6 1.2%	18 3.6%	45 8.9%	434 85.9%	505 100%
PSD3: Artificial Intelligence is exciting.	4.82	.559	2 .4%	4 .8%	17 3.4%	38 7.5%	444 87.9%	505 100%
PSD4: Overall, I would be comfortable interacting with Artificial Intelligence.	4.79	.621	1 .2%	12 2.4%	13 2.6%	41 8.1%	438 86.7%	505 100%
Total	4.79	.577						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

According to the descriptive data, 87.9% of participants strongly agree that artificial intelligence is exciting. 3.6% neither disagree nor agree that artificial intelligence is essential. About .2% of the respondents strongly disagree that they would be comfortable interacting with Artificial Intelligence. A total mean of 4.79 and a standard deviation of .577 indicate that participants generally agreed with the items assessing perceptions of AI service delivery.

6.2.2.3 Perceived Anthropomorphism (PA)

Table 16: Perceived Anthropomorphism

Measurement Item	Mean	SD	1	2	3	4	5	Total
PA1: Using a mobile banking app to complete a task feels similar to interacting with a real person.	3.71	1.05	12 .4%	27 5.3%	219 43.4%	84 16.6%	163 32.3%	505 100%
PA2: The mobile banking app feels friendly.	4.15	.758	2 .4%	4 .8%	88 17.4%	231 45.7%	180 35.6%	505 100%
PA3: I feel that the mobile banking app respects me.	4.13	.778	3 .6%	3 .6%	96 19%	224 44.4%	179 35.4%	505 100%
PA4: The mobile banking app makes me feel interesting.	4.09	.863	5 1%	16 3.2%	89 19.6%	214 42.4%	181 35.8%	505 100%
PA5: The mobile banking app makes me feel considerate.	4.09	.903	7 1.4%	14 2.8%	102 20.2%	188 37.2%	194 38.4%	505 100%
Total	4.03	.784						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The statements evaluating perceived anthropomorphism were agreed upon by participants, as evidenced by the aggregate mean of 4.03 and standard deviation of .784. Of the 505 participants, 45.7% felt that leveraging a mobile banking app to finish a task is enjoyable, while 43.4% were unsure about the contrasts between utilising a mobile banking app and speaking with a real person. 1% of respondents expressed disinterest in mobile banking applications.

6.2.2.4 Social Response Theory (SRT)

Table 17: Social Response

Measurement Item	Mean	SD	1	2	3	4	5	Total
SRT1: There is a sense of human contact in the interaction with the mobile banking app.	4.32	1.04	12 2.4%	27 5.3%	65 12.9%	84 16.6%	317 62.8%	505 100%
SRT2: There is a sense of personalness in the interaction with the mobile banking app.	4.38	.920	7 1.4%	18 3.6%	58 11.5%	115 22.8%	307 60.8%	505 100%
SRT3: There is a sense of sociability in the interaction with the mobile banking app.	4.4	.940	6 1.2%	33 6.5%	27 5.3%	125 24.3%	314 62.2%	505 100%
SRT4: There is a sense of human warmth in the interaction with the mobile banking app.	4.31	1.04	11 2.2%	33 6.5%	55 10.9%	95 18.8%	311 61.6%	505 100%
SRT5: There is a sense of human sensitivity in the interaction with the mobile banking app.	4.38	.975	10 2.0%	30 5.9%	30 5.9%	121 24%	314 62.2%	505 100%
Total	4.36	.937						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

With an overall mean of 4.36 and a standard deviation of .937, Table 17's results show that participants largely agreed with the assessment of the social response hypothesis. More specifically, 62.8% of the participants strongly agreed that there is a sense of human contact in the interaction with the mobile banking app, and 24.3% of participants stated that there is a sense of sociability in the interaction with the mobile banking app. In general, 5.9% of

participants f participants disagreed and neither disagreed nor agreed that there is a sense of human sensitivity in the interaction with mobile banking apps, and 1.2% strongly disagreed that there is a sense of sociability in the interaction with mobile banking apps.

6.2.2.5 Perceived Security (PS)

Table 18: Perceived Security

Measurement Item	Mean	SD	1	2	3	4	5	Total
PS1: I would feel secure sending personal information using mobile banking apps.	4.83	.546	1 .2%	7 1.4%	13 2.6%	33 6.5%	451 89.3%	505 100%
PS2: Mobile banking apps are secure to use for my transactions.	4.90	.353	0	1 .2%	5 1%	39 7.7%	460 91.1%	505 100%
PS3: I would feel safe providing sensitive personal information when using mobile banking app services.	4.84	.566	2 .4%	9 1.8%	8 1.6%	29 5.7%	457 90.5%	505 100%
PS4: Overall, I find that using mobile banking app services is safe.	4.89	.411	1 .2%	2 .4%	5 1%	38 7.5%	459 90.9%	505 100%
Total	4.86	.440						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The mean value was 4.86, with a standard deviation of .440, indicating that participants agreed with the statements assessing perceived security. A total of 91.1% of participants expressed a strong agreement with the assertion that using mobile banking apps for transactions is secure. 7.5% of respondents thought it was safe to use mobile banking apps overall, while none of them strongly disagreed.

6.2.2.6 Performance Expectancy (PE)

Table 19: Performance Expectancy

Measurement Item	Mean	SD	1	2	3	4	5	Total
PE1: I find mobile banking apps useful.	4.94	.260	0	0	2 .4%	28 5.5%	475 94.1%	505 100%
PE2: Using mobile banking apps helps me accomplish my banking needs quickly.	4.94	.246	0	0	2 .4%	24 4.58%	479 94.9%	505 100%
PE3: Mobile banking app service allows completing transactions faster.	4.95	.242	0	0	2 .4%	23 4.6%	480 95%	505 100%
PE4: The mobile banking app is comfortable to use every time and everywhere.	4.92	.318	0	1 .2%	4 .8%	29 5.7%	471 93.3%	505 100%
Total	4.94	.224						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

Approximately 95% of participants strongly agreed mobile banking app service allows completing transactions faster, according to the ratings obtained for each assessment item in Table 18. In contrast, no participant strongly disagreed with the former statement. Of those who participated, 5.7% agreed that the mobile banking app is always and wherever comfortable to use; no one strongly disagreed with this statement. Based on the total mean of 4.94 and standard deviation of .224, participants were typically strongly in agreement with the statements analysing performance expectancy, either mostly or partially.

6.2.2.7 Task Technology Fit (TTF)

Table 20: Task Technology Fit

Measurement Item	Mean	SD	1	2	3	4	5	Total
TTF1: The functions provided by the mobile banking app simplify the banking tasks that I need to complete.	4.91	.312	0	0	4 .8%	37 7.3%	464 91.9%	505 100%
TTF2: The functions provided by the mobile banking app are consistent with the banking tasks that I need to complete.	4.90	.338	0	1 .2%	4 .8%	37 7.3%	463 91.7%	505 100%
TTF3: The various banking service functions provided by the mobile banking app are useful.	4.91	.311	0	0	3 .6%	41 8.1%	461 91.3%	505 100%
TTF4: The services provided by the mobile banking app meet my banking needs.	4.90	.355	0	0	8 1.6%	37 7.3%	460 91.1%	505 100%
TTF5: The banking functions provided by the mobile banking app are comprehensive.	4.85	.470	0	5 1%	9 1.8%	41 8.1%	450 89.1%	505 100%
Total	4.89	.326						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

With an aggregate mean of 4.89 and a standard deviation of .326, the participants were found to have a somewhat high agreement with the task technology fit measurement constructs. The majority of participants—91.9%—strongly agreed that the functionality offered by the mobile

banking app simplifies the banking tasks they need to complete. No participants strongly disagreed with the statement. Moreover, 8.1% of participants concurred that the mobile banking app's banking features are extensive, while 1% were unsure.

6.2.2.8 Gamification (GAM)

Table 21: Gamification

Measurement Item	Mean	SD	1	2	3	4	5	Total
GAM1: I would feel pleasure in the use of a banking app with features of games.	3.47	1.025	25 5%	19 3.8%	262 51.9%	91 18%	108 21.4%	505 100%
GAM2: I think that a banking app with content and animated elements would be secure.	3.66	.965	18 3.6%	15 3%	197 39%	166 32.9%	109 21.6%	505 100%
GAM3: Learning how to use mobile banking during a game on a mobile app would be nice.	3.73	.981	23 4.6%	12 2.4%	154 30.5%	204 40.4%	112 22.2%	505 100%
GAM4: A mobile banking app with features of games would make me feel good and encourage interaction.	3.77	1.013	24 4.8%	16 3.2%	137 27.1%	202 40%	126 26%	505 100%
Total	3.66	.929						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

According to the scores obtained for each measurement item in Table 20, about 51.9% of participants indicated that using a banking app that they would feel pleasure in using a banking app with features of games. In comparison, 40.4% agreed that learning to use mobile banking

during a game on a mobile app would be nice. On average, 3.6% of the participants strongly agreed that a banking app with content and animated elements would be secure. According to the participants' aggregate mean of 3.66 and standard deviation of .929, the statements examining gamification were generally accepted by them.

6.2.2.9 Mobile app interactive quality (IQ)

Table 22: Mobile App Interactive Quality

Measurement Item	Mean	SD	1	2	3	4	5	Total
IQ1: I think that the quality of my interaction with the mobile banking app is excellent.	4.87	.462	2 .4%	2 .4%	7 1.4%	38 7.5%	456 90.3%	505 100%
IQ2: I would say that the mobile banking app shows an interest in my personal banking.	4.81	.610	2 .4%	8 1.8%	19 3.8%	26 5.1%	450 89.1%	505 100%
IQ3: I believe that the mobile banking app provides a user-friendly service to customers.	4.89	.368	0	1 .2%	7 1.4%	37 7.3%	460 91.1%	505 100%
IQ4: I enjoy executing transactions and other banking activities using the mobile banking app.	4.89	.407	0	0	16 3.2%	26 5.1%	463 91.7%	505 100%
Total	4.86	.414						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The statements assessing the quality of mobile app interactions were somewhat firmly agreed upon by the participants, as evidenced by the total mean of 4.86 and standard deviation of .414. No participant significantly disagreed with the assertion that they enjoy executing transactions and other banking activities using the mobile banking app; approximately 91.7% of the

participants strongly agreed with it. 7.5% of participants agreed that the quality of their interaction with the mobile banking app was excellent. Additionally, about .4% of users strongly disagreed that the mobile banking app shows an interest in their banking, and .2% of strongly disagreed participants disagreed that the mobile banking app provides a user-friendly service to consumers.

6.2.2.10 Mobile app service quality (SQ)

Table 23: Mobile App Service Quality

Measurement Item	Mean	SD	1	2	3	4	5	Total
SQ1: The mobile banking app has a modern-looking interface.	4.89	.413	2 .4%	0	6 1.2%	36 7.1%	461 91.3%	505 100%
SQ2: The mobile banking app provides the right solution to my request.	4.89	.392	0	2 .4%	7 1.4%	38 7.5%	458 90.7%	505 100%
SQ3: The mobile banking app gives me individual attention.	4.82	.608	3 .6%	6 1.2%	20 4%	21 4.2%	455 90.1%	505 100%
SQ4: The mobile banking app has an excellent interface to communicate my needs.	4.85	.510	2 .4%	4 .8%	10 2%	34 6.7%	455 90.1%	505 100%
SQ5: The mobile banking app has visually appealing banking content.	4.85	.506	2 .4%	1 .2%	17 3.4%	32 6.3%	453 89.7%	505 100%
Total	4.86	.446						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The overall mean of 4.86 and the standard deviation of .446 show that participants agreed with the assertions regarding the mobile app service quality. Of the 505 participants, 91.3% strongly agreed that the mobile banking app has a modern-looking interface, 7.5% strongly agreed that

the mobile banking app provides the right solution to their request, and .2% indicated that they agree the mobile banking app has visually appealing banking content.

6.2.2.11 Expectation confirmation (EC)

Table 24: Expectation Confirmation

Measurement Item	Mean	SD	1	2	3	4	5	Total
EC1: The mobile banking app meets my expectations.	4.89	.411	1 .2%	1 .2%	8 1.6%	35 6.9%	460 91.1%	505 100%
EC2: My experience using the mobile app was better than I had expected.	4.85	.505	0	4 .8%	20 4%	24 4.8%	457 90.5%	505 100%
EC3: Overall, using the mobile app met my initial expectations.	4.90	.397	1 .2%	1 .2%	7 1.4%	32 6.3%	464 91.9%	505 100%
EC4: The mobile banking app meets my needs.	4.90	.365	1 .2%	0	5 1%	36 7.1%	463 91.7%	505 100%
EC5: The mobile banking app confirms my prior belief and understanding of mobile banking.	4.86	.456	0	3 .6%	13 2.6%	36 7.1%	453 89.7%	505 100%
Total	4.88	.393						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

According to Table 23, which summarises the descriptive statistics findings, 91.9% of the participants strongly agreed that using the mobile app met their initial expectations. Furthermore, 7.1% of the participants agreed that the mobile banking app confirms my prior belief and understanding of mobile banking. 2% agreed that the mobile banking app meets my needs. The participants appeared to be typically quite strongly in agreement with the items measuring expectation confirmation, as indicated by the median value, which was 4.88, and the standard deviation of .393.

6.2.2.12 Trust in Mobile Banking App (TR)

Table 25: Trust in Mobile Banking App

Measurement Item	Mean	SD	1	2	3	4	5	Total
TR1: I believe that mobile banking apps are trustworthy.	4.87	.460	2 .4%	1 .2%	9 1.8%	39 7.7%	454 89.9%	505 100%
TR2: I believe that mobile banking apps have users' interests at heart.	4.83	.577	3 .6%	5 1%	16 3%	30 5.9%	452 89.5%	505 100%
TR3: I believe that mobile banking apps provide safe services.	4.87	.453	2 .4%	1 .2%	8 1.6%	39 7.7%	455 90.1%	505 100%
TR4: I trust mobile banking apps to protect my personal information.	4.85	.492	2 .4%	1 .2%	14 2.8%	36 7.1%	452 89.5%	505 100%
Total	4.85	.471						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

Based on the mean of 4.85 and the standard deviation of .471, 90, participants were largely in agreement with the statements reflecting their trust in the mobile banking app. It was strongly agreed by 1% of the 505 participants that mobile banking apps provide secure services. Only 1% of respondents disagreed that mobile banking apps prioritise the needs of their consumers. Of the participants, about 2% were not sure if they agreed or disagreed that security features on mobile banking apps protect users' personal information.

6.2.2.13 Mobile Banking App Adoption (MBA)

Table 26: Mobile Banking App Adoption

Measurement Item	Mean	SD	1	2	3	4	5	Total
MBA1: I have adopted mobile banking apps because of lack of time and place limitations, ease of use and improves people's banking knowledge.	4.84	.470	0	3 .6%	12 2.4%	50 9.9%	440 87.1%	505 100%
MBA2: I adopted mobile banking apps because it is easy to use in my daily transactions.	4.86	.386	0	0	7 1.4%	57 11.3%	441 87.3	505 100%
MBA3: Since I can make vivid and understandable connections with my banking providers using mobile banking app services, I decided to accept its use.	4.83	.441	0	0	13 2.6%	61 12.1%	431 85.3	505 100%
MBA4: The outstanding flexibility of mobile banking app services justifies its use.	4.86	.395	0	0	8 1.6%	57 11.3%	440 87.1%	505 100%
Total	4.84	.390						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The results shown in Table 26 demonstrate that the participants agreed with the assessments of the use of mobile banking apps, with an overall mean of 484 and a standard deviation of .390. Particularly, 87.3 per cent of participants strongly agreed that they use mobile banking apps for

everyday transactions because they are user-friendly. 12.1% agree that they have decided to allow its use because mobile banking app services allow them to have clear and understandable communication with their banking providers. All things considered, none of the participants strongly disagreed with the following:

- The outstanding flexibility of mobile banking app services justifies its use.
- I have adopted mobile banking apps because of the lack of time and place limitations, ease of use and improves people's banking knowledge.

6.2.2.14 Mobile Banking app satisfaction (STA)

Table 27: Mobile Banking App Satisfaction

Measurement Item	Mean	SD	1	2	3	4	5	Total
STA1: Considering all things, I am very satisfied with the mobile banking app.	4.88	.418	0	3 .6%	9 1.8%	32 6.3%	461 91.3%	505 100%
STA2: Overall, the content of the mobile banking app satisfies my initial expectations (What I had expected).	4.88	.412	0	2 .4%	10 2%	35 6.9%	458 90.7%	505 100%
STA3: Overall, I am happy with the performance of the mobile banking app.	4.88	.394	0	2 .4%	7 1.4%	39 7.7	457 90.5	505 100%
STA4: I am happy with the mobile banking app.	4.89	.383	0	2 .4%	6 1.2%	38 7.5%	459 90.9%	505 100%
Total	4.88	.389						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

The findings showed that the participants agreed with the statements assessing their happiness with the mobile banking app, with the overall mean being 4.88 and the standard deviation being .389. Nearly 91.3% of the participants strongly agreed with being very satisfied with the mobile banking app, and 7.7% of participants agreed that they were happy with the performance of the mobile banking app. While .4% disagree that the content of the mobile banking app satisfies their initial expectation.

6.2.2.15 Mobile banking app continuous use (CU)

Table 28: Mobile Banking App Continuous Use

Measurement Item	Mean	SD	1	2	3	4	5	Total
CU1: I will continue to use the mobile banking app in the future.	4.94	.253	0	0	2 .4%	26 5.1%	477 94.5%	505 100%
CU2: I will maintain my frequent use of mobile banking app services in the future.	4.94	.253	0	0	2 .4%	26 5.1%	477 94.5%	505 100%
CU3: I will continue to use the mobile banking app to make transactions and manage my accounts.	4.94	.253	0	0	2 .4%	26 5.1%	477 94.5%	505 100%
CU4: I will recommend mobile banking app services to others.	4.92	.344	0	1 .2%	8 1.6%	22 4.4%	474 93.9%	505 100%
Total	4.94	.256						

Note: SD – standard deviation; 1 = Strongly disagree; 2 = Disagree; 3 = Neither disagree nor agree; 4 = Agree; 5 = Strongly agree

Source: Researcher's compilation (2023).

Table 28 shows that participants highly agreed with the measured notions of continuous usage of mobile banking apps, with an overall mean of 4.94 and a standard deviation of .256. The following assertions were strongly agreed with by 94.5% of the participants.

- I will continue to use the mobile banking app in the future.

- I will maintain my frequent use of mobile banking app services in the future.
- I will continue to use the mobile banking app to make transactions and manage my accounts.

No participant expressed a strong disagreement. 1.6% neither disagree nor agree they will endorse mobile banking app services to others.

6.3 CONFIRMATORY FACTOR ANALYSIS (CFA)

6.3.1 Assessment of Normality

As explained in Chapter 5, the study employs SEM techniques to scrutinise the interplay among multiple independent and dependent variables, unravelling the intricate relationships woven within the study's framework. A pivotal component of this analytical endeavour is the execution of CFA. This methodological choice, as advocated by Mueller and Hancock (2019) and Schreiber et al. (2006), seeks to scrutinise, refine, and enhance the measurement model essential to the study's overarching objectives.

According to Bono, Arnau, Alarcón and Blanca, (2019) two generally used measurements for defining the shape of a distribution are skewness and kurtosis. Skewness evaluates the degree of asymmetry in a distribution, while kurtosis assesses how flat or peaked the distribution is compared to a normal distribution. The author also highlights that the acceptable skewness and kurtosis values will vary depending on several variables, such as the studied data and the statistical analysis used (Bono, 2019). It is crucial to note that the study literature does not agree on appropriate thresholds for skewness and kurtosis. For skewness and kurtosis, Demir (2022), has proposed a threshold of 1.3 and 1.5 while others (Brown, 2019; George & Mallery, 2019) have indicated a threshold of 2 or even 3. Several variables, such as the precise research topic, the data being studied, and the statistical analysis being done, will influence the threshold for acceptable skewness and kurtosis values. Generally, it is vital to consider the context of the studied data and the size of the skewness or kurtosis value.

For instance, in some circumstances, skewness or kurtosis values higher than the advised threshold could be acceptable if the data are roughly average and the sample size is sufficient (Tabachnick & Fidell, 2019). It is also crucial to remember that some statistical tests, like regression analysis, may still be valid in the face of violations of the normality assumptions

even when the skewness or kurtosis values are outside of the acceptable range (Kline, 2019). Additionally, it is essential to remember that the interpretation of skewness and kurtosis values varies based on the distribution being studied. A positively skewed distribution, for instance, would have a skewness value higher than 0, whereas a negatively skewed distribution would have a skewness value lower than 0 (Tabachnick & Fidell, 2019). Leptokurtic distributions, which are higher peaked than normal distributions, will have positive kurtosis values, whereas platykurtic distributions, which are lower peaked than normal distributions, will have negative kurtosis values (Kline, 2019; Tabachnick & Fidell, 2019).

In conclusion, although there is no universal cutoff for acceptable skewness and kurtosis values, researchers should carefully analyse the context of their data and consult the proper statistical resources when interpreting these metrics.

6.3.2 Reliability and validity of construct results

6.3.2.1 Reliability tests (Cronbach alpha and composite reliability)

6.3.2.1 Reliability tests - Cronbach alpha

In the meticulous scrutiny of the constructs under consideration within this study, a pivotal aspect pertains to the evaluation of their reliability. This foundational analysis is instrumental in affirming the internal consistency and precision of the measurement model (Kennedy, 2022). The metrics employed for this purpose encompassed the widely acknowledged Cronbach's alpha (α), along with the composite reliability (ρ_c and ρ_a).

6.3.2.1.1 Cronbach's Alpha (α): A Measure of Internal Consistency

The examination commenced with the venerable Cronbach's alpha (α), a statistical metric entrenched in its ability to gauge the internal consistency of constructs. As an indicator of how closely related a set of items are as a group, all constructs initially exhibited Cronbach's alpha values exceeding the conventional threshold of 0.7 (Cuadros, Serrano, Garcia-Zubia & Hernandez-Jayo, 2021; Cheung, Cooper-Thomas, Lau & Wang, 2023). This underscores the robustness of the constructs, affirming their coherence and reliability in capturing the underlying phenomena (Cheung et al., 2023).

6.3.2.1.2 Composite Reliability (ρ_c and ρ_a)

Complementing the insights gleaned from Cronbach's alpha, the assessment extended to composite reliability, encapsulated by both ρ_c and ρ_a . These indices provide a nuanced understanding of the constructs' reliability, considering both the common and unique variances (Cheung et al., 2023). Importantly, all constructs demonstrated values surpassing the commendable threshold of 0.7. The congruence between the two reliability measures reaffirms the robustness and stability of the measurement model.

6.3.2.1.3 Implications for Construct Reliability

The elevated values of Cronbach's alpha, ρ_c , and ρ_a collectively signify a commendable level of internal consistency within the constructs (Gimeno Arias, Santos Jaén, Valls Martínez & Sánchez Pérez, 2023). This reliability not only fortifies the credibility of the measurement model but also instils confidence in the precision of the constructs' operationalisations. Such reliability is foundational for subsequent analyses, engendering trust in the validity of inferences drawn from the study.

6.3.2.2 Reliability tests - Composite reliability

The scrutiny of convergent validity, a pivotal facet of construct validation, is undertaken through a detailed examination of Table 30. This table encapsulates the Average Variance Extracted (AVE) in tandem with the factor loadings attributed to individual construct items. The confluence of these metrics provides insights into the constructs' ability to converge and capture the underlying variance. The established criterion for convergent validity posits a minimum threshold of 0.5 for the AVE, which is a standard (Zaiğ & Berteau, 2011).

6.3.2.3 Average Variance Extracted (AVE): An Indicator of Convergent Validity

The Average Variance Extracted (AVE) serves as a pivotal metric in the assessment of convergent validity. It encapsulates the extent to which the variance captured by the construct's items surpasses the variance attributable to measurement error. As per established best practice, a minimum threshold of 0.5 is considered indicative of robust convergent validity (Cheung, Cooper-Thomas, Lau & Wang, 2023.).

6.3.2.4 Implications and Acceptance Criteria

Given that both Cronbach's alpha and Composite Reliability for all constructs surpass the commendable threshold of 0.7, the acceptance of an AVE below 0.5 is rationalised, as per the guidance of Zaiț and Berteau (2011). This nuanced consideration recognizes the trade-off between internal consistency and the need for constructs to converge adequately.

Table 29: Cronbach's alpha

Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
CU	0.953	0.956	0.967	0.880
EC	0.955	0.956	0.966	0.849
GAM	0.951	0.957	0.964	0.871
IQ	0.921	0.927	0.944	0.810
MBA	0.941	0.944	0.958	0.849
PA	0.942	0.969	0.955	0.810
PE	0.938	0.938	0.956	0.843
PI	0.873	0.914	0.911	0.721
PS	0.953	0.955	0.966	0.876
PSD	0.970	0.976	0.978	0.917
SQ	0.954	0.954	0.965	0.845
SRT	0.966	0.972	0.975	0.908
STA	0.978	0.978	0.984	0.938
TR	0.966	0.966	0.975	0.908
TTF	0.951	0.953	0.963	0.838

6.3.2.5 Discriminant validity - Fornell Larcker

The Fornell and Lacker criterion is examined to evaluate the discriminant validity. According to this criterion, a construct's square root of its average variance must be greater than its correlation with any other construct. Discriminant validity is established when this condition is satisfied (Franke & Sarstedt, 2019; Hair et al., 2020). The results of the analysis indicate the discriminant validity because the squared Average Variance Extracted (AVE) is greater than the correlation between the items. The Fornell and Lacker criterion validates the study's discriminant validity, although further investigation indicates that this measure is not suitable for assessing discriminant validity (Hair et al., 2021). Thus, the study used the Heterotrait-Monotrait (HTMT) ratio.

Table 30:Fornell and Lacker

Constructs	CU	EC	GAM	IQ	MBA	PA	PE	PI	PS	PSD	SQ	SRT	STA	TR	TTF
CU	0.938														
EC	0.802	0.921													
GAM	0.361	0.473	0.933												
IQ	0.770	0.861	0.478	0.900											
MBA	0.651	0.709	0.405	0.701	0.922										
PA	0.313	0.405	0.347	0.480	0.335	0.900									
PE	0.782	0.734	0.364	0.739	0.652	0.301	0.918								
PI	0.510	0.590	0.327	0.700	0.471	0.397	0.480	0.849							
PS	0.689	0.751	0.488	0.748	0.579	0.325	0.671	0.577	0.936						
PSD	0.615	0.605	0.288	0.662	0.476	0.327	0.602	0.680	0.651	0.958					
SQ	0.732	0.898	0.479	0.876	0.709	0.411	0.664	0.628	0.730	0.563	0.919				
SRT	0.466	0.641	0.472	0.676	0.459	0.498	0.474	0.513	0.584	0.475	0.650	0.953			
STA	0.793	0.956	0.462	0.863	0.711	0.418	0.719	0.599	0.707	0.600	0.863	0.620	0.969		
TR	0.734	0.842	0.490	0.839	0.634	0.375	0.654	0.600	0.875	0.630	0.796	0.597	0.825	0.953	
TTF	0.761	0.869	0.452	0.863	0.686	0.419	0.754	0.700	0.798	0.646	0.835	0.621	0.861	0.779	0.915

6.3.2.6 Model Fit

When utilising the Components-based method via Smart-PLS, many indices can be seen. Researchers utilising SmartPLS are advised to exercise caution when observing the goodness model and to avoid employing indices like the NFI and SRMR (Henseler, Dijkstra, Sarstedt, Ringle, Diamantopoulos, Straub, Ketchen, Hair, Hult & Calantone, 2014). Nonetheless, these will be discussed and provided for this research study because they do, in part, reflect the divergence of the covariance models (Sarstedt, Ringle & Hair, 2021). These are shown in Table as follows.

Table 31: Model Fit

	Saturated model	Threshold
SRMR	0.056	< 0.1 (or < 0.08)
NFI	0.729	> 0.9

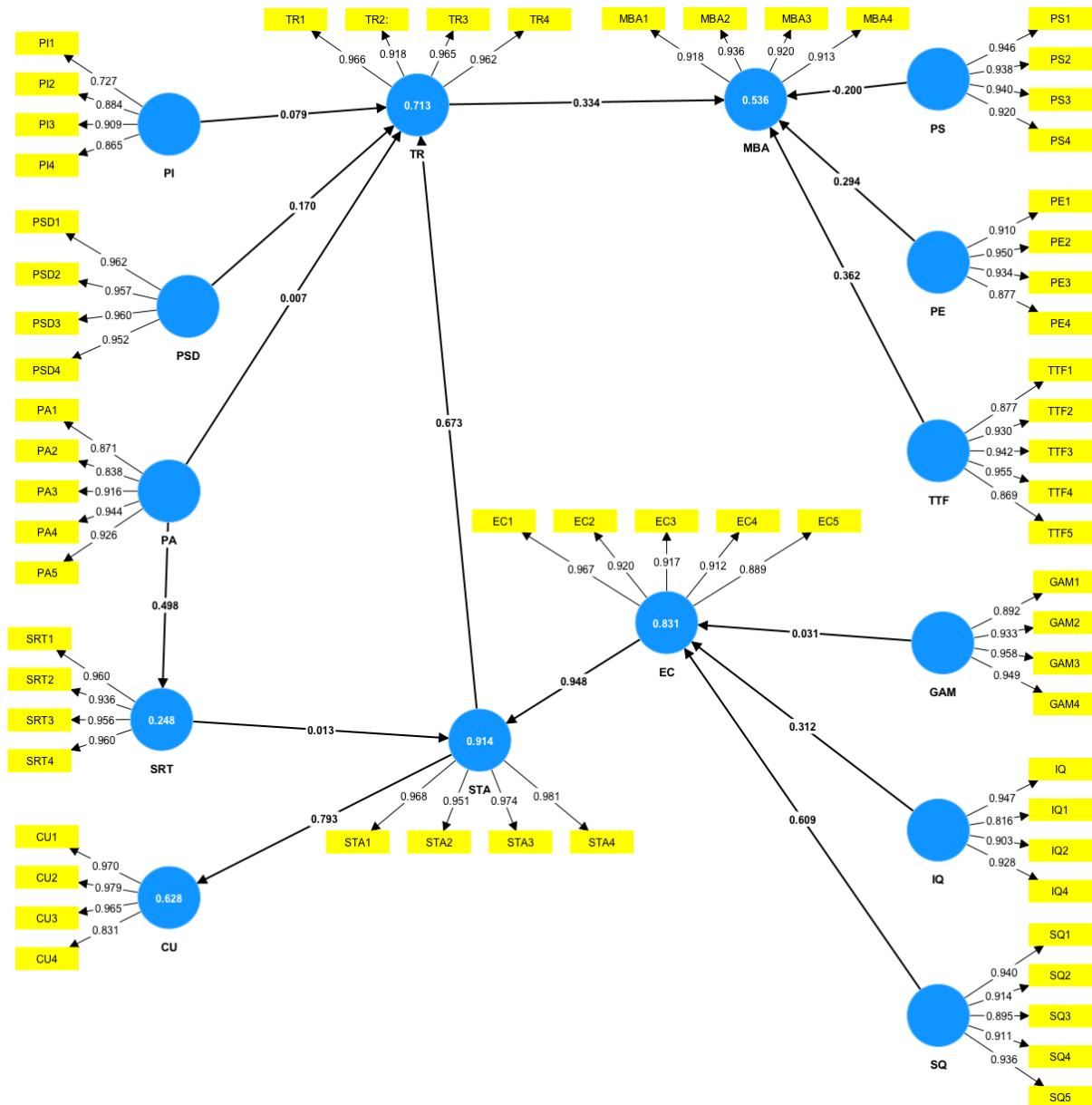


Figure 27: Original Model (Researchers Own Design)

Consequently, observing the values shows indices over the necessary cutoff, confirming a good model fit for the research.

6.3.3.7 Measurement Model

The relationship between a construct and its observed items is assessed by the measurement model (Hair et al., 2020). To determine the quality of the constructs, the study assesses the measurement model. Before formulating the constructs' validity and reliability, factor loading will be evaluated. According to Hair et al. (2019), loading above 0.708 is advised since it shows that the construction accounts for more than 50% of the indicator's variance and offers a reliable item. A factor loading greater than 0.708 is deemed appropriate because it signifies that the

measurement construct explains over 50% of the variance of the indicator (Hair et al., 2019). Besides providing a dependable item, it also suggests a strong correlation between the observable variables and the latent constructs. The table below illustrates, the study found factor loadings of greater than 0.8. A strong and substantial link between the latent variables and the observable variables is thus indicated by the factor analysis above the prescribed threshold.

PA2	0.837
PA3	0.916
PA4	0.944
PA5	0.925
PE1	0.911
PE2	0.943
PE3	0.927
PE4	0.888
PI1	0.685
PI2	0.845
PI3	0.897
PI4	0.888
PI5	0.883
PS1	0.946
PS2	0.938
PS3	0.940
PS4	0.920
PSD1	0.962
PSD2	0.957
PSD3	0.961
PSD4	0.951
SQ1	0.932
SQ2	0.910
SQ3	0.909
SQ4	0.908
SQ5	0.934
SRT2	0.919

SRT3	0.959
SRT4	0.973
SRT5	0.966
STA1	0.968
STA2	0.951
STA3	0.975
STA4	0.980
TR1	0.965
TR2:	0.921
TR3	0.964
TR4	0.961
TTF1	0.871
TTF2	0.933
TTF3	0.940
TTF4	0.954
TTF5	0.875

6.3.3.10.2 Indicator Multicollineality (VIF)

The examination of multicollinearity in the study involves a thorough analysis of Variance Inflation Factor (VIF) values, with the established threshold set at $VIF < 5$ (or < 10), (Fornell & Bookstein, 1982; Hashem, 2020). The VIF results, outlined in Table below, reveal noteworthy values CU1, CU2, CU3, EC1, EC3, EC4, GAM3, GAM4, IQ3 PA4, PA5, PE2, PE3, PS1, PS3, PSD1, PSD2, PSD3, PSD4, SQ1, SQ2, SQ5, SRT1, SRT2, SRT3, SRT4, STA1, STA2, STA3, STA4, TR1, TR3, TR4, TTF3 and TTF4, surpassing the conservative threshold of 5. Moreover, the VIF values for EC3, EC4, GAM3, GAM4, IQ3, PA4, PA5, PE4, PA4, PS1, PS3, PSD1, PSD2, PSD3, PSD4, SQ1, SQ2, SQ5, SRT1, SRT2, SRT3, SRT4, STA1, STA2, STA3, STA4, TR1, TR3, TR4, TTF4, and TTF5 also exhibit noticeable elevation above the conservative threshold of 5. Despite this, most values remain below the commonly accepted threshold of 10. Consequently, to address the elevated VIF values of CU1, CU2, and CU3 bootstrapping has been applied to enhance the robustness of the analysis.

Table 33: Multicollinearity Results (VIF)

VIF							
Constructs		Constructs		Constructs		Constructs	
CU1	16.649	IQ4	4.955	PI3	3.197	SRT2	5.548
CU2	32.503	MBA1	4.029	PI4	2.357	SRT3	6.996
CU3	16.367	MBA2	4.945	PS1	6.117	SRT4	7.412
CU4	2.112	MBA3	3.757	PS2	4.620	STA1	10.880
EC1	11.419	MBA4	3.274	PS3	5.709	STA2	6.842
EC2	4.436	PA1	2.971	PS4	3.728	STA3	12.172
EC3	5.234	PA2	2.936	PSD1	7.491	STA4	14.480
EC4	5.717	PA3	4.372	PSD2	7.263	TR1	8.819
EC5	3.271	PA4	6.632	PSD3	8.140	TR2:	3.773
GAM1	3.213	PA5	5.587	PSD4	5.833	TR3	9.896
GAM2	4.656	PE1	3.430	SQ1	7.249	TR4	8.630
GAM3	8.322	PE2	7.629	SQ2	5.229	TTF1	3.367

GAM4	7.180	PE3	6.591	SQ3	3.656	TTF2	4.964
IQ3	5.879	PE4	2.587	SQ4	4.196	TTF3	6.212
IQ1	1.993	PI1	2.113	SQ5	6.014	TTF4	7.506
IQ2	3.198	PI2	3.169	SRT1	7.378	TTF5	3.306

6.4 THE STRUCTURAL MODEL AND HYPOTHESES TESTING

In the realm of Structural Equation Modeling (SEM) facilitated by Smart-PLS, the evaluation of predictive capabilities stands as a pivotal stride towards gauging the model's fitness. This intricate assessment is undertaken through a nuanced exploration of R-square, Q-square, and F-square analyses. The subsequent sections delve into the meticulous dissection of the R-square, focusing on the different dependent variables—Attitude, Intention, Personalisation, and Privacy Concerns—as integral components of the overarching explanatory power investigation for the model.

6.4.1 Structural Model Assessment

The measurement model has been evaluated, the structural path will now be examined to determine the statistical significance of the path coefficients, or correlations between the research constructs.

Table 34: Hypothesis Results

Constructs	Beta Coefficient	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Hypothesis
PS -> MBA	0.030	0.032	0.068	0.450	0.653	H 1 - Not supported
PE -> MBA	0.308	0.307	0.076	4.032	0.000	H 2 - Supported
TTF -> MBA	0.429	0.429	0.088	4.861	0.000	H3 - Supported
GAM -> EC	0.031	0.028	0.024	1.279	0.201	H 4 – Not Supported
IQ -> EC	0.312	0.330	0.149	2.094	0.036	H 5 - Supported
SQ -> EC	0.609	0.597	0.152	4.007	0.000	H 6- Supported

EC -> STA	0.901	0.902	0.038	23.785	0.000	H 7 - Supported
PI -> TR	0.078	0.088	0.083	0.933	0.351	H 8 - Not supported
PSD -> TR	0.171	0.173	0.060	2.841	0.005	H 9 – Supported
PA -> TR	0.007	0.009	0.027	0.241	0.810	H 10 – Not supported
PA -> SRT	0.498	0.497	0.041	12.181	0.000	H 11 - Supported
SRT -> STA	0.012	0.013	0.033	0.377	0.706	H 12 - Not supported
STA -> TR	0.674	0.666	0.108	6.233	0.000	H 13 - Supported
MBA -> STA	0.066	0.065	0.031	2.147	0.032	H 14 - Supported
STA -> CU	0.793	0.794	0.041	19.417	0.000	H 15 - Supported

6.4.1.1 Assessment and Interpretation

This section describes the reporting and interpretation of the structural model assessment based on the findings shown in the above Table.

6.4.1.1.1 Relationship between perceived security and mobile banking adoption (H1)

H1 evaluates whether perceived security significantly and positively impacts mobile banking app adoption. The results revealed that perceived security has an insignificant impact on mobile banking adoption (B= 0.030, t= 0.450, p= 0.653).

Interpretation:

There is not enough evidence to support a significant relationship between perceived security and mobile banking adoption in the context of the study. The p-value of 0.653 suggests that any observed relationship could likely be due to random chance, and it is not statistically significant.

6.4.1.1.2 Relationship between performance expectancy and mobile banking adoption (H2)

H2 evaluates whether performance expectancy significantly and positively impacts mobile banking app adoption. The results revealed that performance expectancy has a significant impact on mobile banking app adoption ($B = 0.308$, $t = 4.032$, $p < 0.001$).

Interpretation:

There is strong evidence to support a significant positive relationship between performance expectancy and mobile banking adoption in the context of the study. The p-value of 0.000 indicates that the observed relationship is unlikely to be due to random chance and is statistically significant. This result suggests that, according to the study's findings, higher performance expectancy is associated with increased mobile banking adoption. Users who perceive higher performance benefits from using mobile banking are more likely to adopt it.

6.4.1.1.3 Relationship between task Technology fit and mobile banking adoption (H3)

H3 evaluates whether task technology fits significantly and positively impacts mobile banking app adoption. The results revealed that task technology fit has a significant impact on mobile banking app adoption ($B = 0.429$, $t = 4.861$, $p < 0.001$).

Interpretation:

There is strong evidence to support a significant positive relationship between task technology fit and mobile banking adoption in the context of the study. The p-value of < 0.001 indicates that the observed relationship is unlikely to be due to random chance and is statistically significant. This result suggests that, according to the study's findings, a better fit between the tasks users want to accomplish and the technology provided by mobile banking positively influences its adoption. A good alignment between technology and tasks enhances the likelihood of mobile banking adoption.

6.4.1.1.4 Relationship between gamification and expectation confirmation (H4)

H4 evaluates whether gamification significantly and positively impacts expectation confirmation. The results revealed that gamification has an insignificant impact on expectation confirmation ($B = 0.031$, $t = 1.279$, $p = 0.201$).

Interpretation:

There is not enough evidence to support a significant relationship between gamification and expectation confirmation (EC) in the context of the study. The p-value of 0.201 suggests that the observed relationship could be due to random chance and is not statistically significant. This result indicates that, according to your findings, gamification may not have a significant impact on expectation confirmation in the context of mobile banking adoption.

6.4.1.1.5 Relationship between Interactive Quality and Expectation Confirmation (H5)

H5 evaluates whether interactive quality significantly and positively impacts expectation confirmation. The results revealed that interactive quality has a significant impact on expectation confirmation ($B = 0.330$, $t = 2.094$, $p < 0.001$).

Interpretation:

There is significant evidence to support a positive relationship between mobile interactive quality and expectation confirmation in the context of the study. The p-value of 0.036 indicates that the observed relationship is unlikely to be due to random chance and is statistically significant. This result suggests that, according to the study's findings, higher levels of mobile interactive quality may lead to higher levels of expectation confirmation in the context of mobile banking adoption.

6.4.1.1.6 Relationship between mobile service quality and expectation confirmation (H6)

H6 evaluates whether mobile service quality significantly and positively impacts expectation confirmation. The results revealed that mobile service quality has a significant impact on expectation confirmation ($B = 0.609$, $t = 4.007$, $p < 0.001$).

Interpretation:

There is significant evidence to support a positive relationship between mobile service quality and expectation confirmation in the context of the study. The p-value of 0.000 indicates that the observed relationship is highly unlikely to be due to random chance and is statistically significant. This result suggests that, based on the study's findings, higher levels of mobile

service quality may lead to higher levels of expectation confirmation in the context of mobile banking adoption.

6.4.1.1.7 Relationship between expectation confirmation and satisfaction (H7)

H7 evaluates whether expectation confirmation significantly and positively impacts satisfaction. The results revealed that expectation confirmation has a significant impact on satisfaction ($B = 0.901$, $t = 23.785$, $p < 0.001$).

Interpretation:

The statistical findings provide compelling evidence for a substantial positive association between expectation confirmation and satisfaction. The exceptionally low p-value suggests that the observed relationship is highly unlikely to occur by random chance. In practical terms, these results imply that higher levels of expectation confirmation are positively linked to increased levels of satisfaction within the studied context. This insight contributes valuable understanding of the dynamics between expectation confirmation and satisfaction in the realm of the examined phenomena. It is noteworthy that the robustness and significance of these findings underscore the importance of expectation confirmation as a contributing factor to the overall satisfaction experienced by individuals involved in the studied domain. Further discussions and implications of this relationship may be explored in subsequent sections of the research.

6.4.1.1.8 Relationship between Perceived Artificial Intelligence and trust in mobile banking app (H8)

H8 evaluates whether perceived artificial intelligence significantly and positively impacts trust in mobile banking apps. The results revealed that perceived artificial intelligence has an insignificant impact on trust in mobile banking apps ($B = 0.078$, $t = 0.933$, $p = 0.350$).

Interpretation:

The statistical findings do not provide sufficient evidence to support a significant negative relationship between perceived artificial intelligence and trust in the mobile banking app. The higher p-value suggests that the observed relationship is likely to occur by random chance. In practical terms, these results imply that there is no substantial negative association between perceived artificial intelligence and trust within the studied context. The absence of a statistically significant relationship suggests that variations in perceived artificial intelligence

may not be a reliable predictor of changes in trust levels in the context of mobile banking applications. Researchers and practitioners may consider exploring alternative factors or dimensions that could influence trust in mobile banking applications, as perceived artificial intelligence does not emerge as a significant contributor based on the findings of this analysis. Further discussions and implications of these results can be addressed in subsequent sections of the research.

6.4.1.1.9 Relationship between Perceptions of Artificial Intelligence and Trust in Mobile Banking Apps (H9)

H9 evaluates whether perceptions of artificial intelligence significantly and positively impact trust in mobile banking apps. The results revealed that perceptions of artificial intelligence have a significant impact on trust in mobile banking apps ($B = 0.171$, $t = 2.841$, $p < 0.001$).

Interpretation:

These statistical findings substantiate a noteworthy negative relationship between perceptions of security and trust in the mobile banking application. The diminished p-value implies that the observed relationship is statistically significant, offering assurance that it is not a random occurrence. Practically, these outcomes signify that variations in individuals' perceptions of security markedly influence the levels of trust they place in mobile banking apps. Consequently, users who harbour heightened perceptions of security are more inclined to exhibit greater trust in the platform. Researchers and industry practitioners can derive valuable insights from these findings to strategically underscore and augment security features in mobile banking applications. Further exploration of the implications and potential applications of these results is recommended in subsequent sections of the research discourse.

6.4.1.1.10 Relationship between Perceived Anthropomorphism and Trust in Mobile Banking Apps (H10)

H10 evaluates whether perceived anthropomorphism significantly and positively impacts expectation confirmation. The results revealed that perceived anthropomorphism has an insignificant impact on expectation confirmation ($B = 0.007$, $t = 0.241$, $p = 0.810$).

Interpretation:

These statistical findings indicate an insignificantly weak negative relationship between perceived anthropomorphism and trust in the mobile banking application. The elevated p-value suggests that the observed relationship lacks statistical significance, implying that any observed association may be a product of chance. Practically, these results suggest that variations in individuals' perceptions of anthropomorphism may not substantially impact the levels of trust they place in the mobile banking application. Consequently, users' trust in the platform may not be notably influenced by anthropomorphic features. Researchers and industry practitioners should acknowledge these findings when considering the incorporation of anthropomorphic elements in mobile banking applications, understanding that such features may not significantly contribute to the establishment of user trust. Further exploration of these implications and potential applications is encouraged for a comprehensive understanding of user trust dynamics in mobile banking apps.

6.4.1.1.11 Relationship between perceived anthropomorphism and social response theory (H11)

H11 evaluates whether perceptions of artificial intelligence significantly and positively impact social response. The results revealed that perceptions of artificial intelligence have a significant impact on social response ($B = 0.498$, $t = 12.181$, $p < 0.001$).

Interpretation:

These statistical outcomes suggest that as individuals perceive anthropomorphic features in mobile banking applications, there is a substantial and positively associated impact on their social responses. Users appear to engage more responsively with mobile banking interfaces that incorporate anthropomorphic elements. Practically, these results emphasise the potential of anthropomorphism to enhance social responses within the realm of mobile banking. Developers and designers may consider leveraging anthropomorphic design elements to foster a more engaging and socially responsive user experience. This understanding contributes valuable insights to both academia and industry, guiding the strategic integration of anthropomorphic features for improved user interaction and engagement.

6.4.1.1.12 Relationship between social response theory and satisfaction (H12)

H12 evaluates whether social response significantly and positively impacts satisfaction. The results revealed that social response has an insignificant impact on satisfaction ($B = 0.012$, $t = 0.377$, $p = 0.706$).

Interpretation:

These findings suggest that, based on the statistical analysis conducted, there is insufficient evidence to conclude that social responses, as conceptualised by Social Response Theory, have a significant negative impact on user satisfaction in the context of mobile banking applications. This academic scrutiny underscores the importance of rigorous statistical examination in concluding relationships between theoretical constructs. While the hypothesis at hand did not receive empirical support, it contributes to the nuanced understanding of factors influencing user satisfaction in mobile banking, prompting further inquiry and refinement of theoretical frameworks.

6.4.1.1.13 Relationship between Satisfaction and Trust in Mobile Banking Apps (H13)

H13 evaluates whether satisfaction significantly and positively impacts trust in mobile banking apps. The results revealed that perceptions of satisfaction have a significant impact on trust in mobile banking apps ($B = 0.674$, $t = 6.233$, $p < 0.001$).

Interpretation:

These results imply that, based on the statistical analysis performed, higher levels of user satisfaction are strongly associated with increased levels of trust in the context of mobile banking applications. This underscores the importance of user satisfaction as a contributing factor to the establishment and enhancement of trust in the mobile banking user experience. This academic analysis contributes valuable insights to the existing body of knowledge, shedding light on the intricate dynamics between user satisfaction and trust in the context of mobile banking, with implications for theoretical frameworks and practical considerations in the design and management of mobile banking services.

6.4.1.1.14 Relationship between trust and mobile banking app adoption (H14)

H14 evaluates whether mobile banking app adoption significantly and positively impacts satisfaction. The results revealed that mobile banking app adoption has a significant impact on satisfaction ($B = 0.066$, $t = 2.147$, $p < 0.001$).

Interpretation:

These findings suggest that, based on the statistical evidence, an increase in mobile banking app adoption is associated with a decrease in user satisfaction. This outcome emphasises the need for a nuanced understanding of the factors influencing user satisfaction within the mobile banking app adoption landscape. This academic analysis contributes to the existing knowledge by providing empirical support for the negative relationship between mobile banking app adoption and user satisfaction, highlighting potential areas for improvement in the design and implementation of mobile banking services.

6.4.1.1.15 Relationship between satisfaction and continuous use of mobile banking app (H15)

H15 evaluates whether satisfaction significantly and positively impacts the continuous use of the mobile banking application. The results revealed that satisfaction has a significant impact on the continuous use of the mobile banking application ($B = 0.793$, $t = 19.417$, $p < 0.001$).

Interpretation:

These findings imply that, based on robust statistical evidence, higher levels of user satisfaction are closely linked to increased tendencies for continuous use of mobile banking apps. This outcome underscores the crucial role of user satisfaction as a determinant factor in fostering and sustaining user commitment to mobile banking services. The academic analysis contributes substantively to the existing body of knowledge by providing empirical validation for the positive relationship posited between user satisfaction and the continuous use of mobile banking applications. This emphasises the strategic importance of prioritising user satisfaction in initiatives aimed at promoting persistent and meaningful utilisation of mobile banking technologies.

6.4.2 R-Square Analysis

The R-square metric emerges as a lighthouse, guiding the inquiry into the model's ability to elucidate and predict variance within distinct dependent variables. Within the ambit of this study, the spotlight is cast upon four pivotal variables: Continuous Use, Expectation Confirmation, Mobile Banking Adoption, Social Response Theory, Satisfaction and Trust. The analysis, results, and implications of the R-square examination are meticulously detailed in Table 31, a repository of insights into the predictive prowess of the model.

The interpretation of R-square values assumes a critical dimension in elucidating the proportion of variance in the dependent variables explicated by the model. Higher R-square values signify a greater explanatory power, indicating the efficacy of the model in capturing and foretelling changes in the dependent variables.

Table 35: R- Squared

Constructs	R-square	R-square adjusted
CU	0.628	0.627
EC	0.831	0.830
MBA	0.536	0.532
SRT	0.248	0.246
STA	0.914	0.913
TR	0.713	0.710

Social Response Theory, as woven into the model, unfolds with a discernible trait of modest strength, manifesting as an R-square value below the 0.5 threshold. This modesty in explanatory power prompts a closer inspection, inviting reflections on the intricate dynamics influencing Social Response Theory within the context of the model.

Conversely, the constructs beyond Social Response Theory paint a picture of more robust explanatory prowess. The R-square values associated with these constructs ascend above the 0.5 benchmark, signifying a moderate strength in elucidating the variance within the model. The yardstick set forth by Hair et al. (2013) serves as the lodestar for this analysis, elucidating the demarcation between weak and moderate strengths. The interpretation hinges on the premise that values below 0.5 denote a weaker explanatory contribution, while those surpassing this threshold imply a more moderate yet substantial influence on the model's variance.

6.4.3 Q – Squared

In the pursuit of comprehending the predictive relevance inherent in the model employed within this study, the Q-square analysis assumes paramount significance. This analytical framework, as expounded by Bayaga (2021), serves as a litmus test for the predictive prowess encapsulated within the model. The lens of scrutiny is directed towards the dependent variables, each meticulously assessed against the backdrop of a predefined threshold. The ensuing revelations, encapsulated in Table 35, serve as a cornerstone in affirming the predictive relevance of the study.

Table 36: Q - Squared

	Q²predict	RMSE	MAE
CU	0.572	0.669	0.227
EC	0.800	0.458	0.135
MBA	0.499	0.715	0.387
SRT	0.243	0.875	0.687
STA	0.773	0.486	0.140
TR	0.674	0.591	0.187

At its core, the Q-square analysis acts as a vanguard, probing the predictive mettle of the model through a lens of empirical scrutiny. This assessment, rooted in the seminal work of Bayaga (2021), unfurls an intricate tapestry wherein the predictive relevance of the model finds validation. The crux of the Q-square analysis lies in the examination of dependent variables, each meticulously evaluated against a defined threshold. As the results in Table 37 resoundingly articulate, the values attributed to these variables transcend the pivotal threshold of 0. This unequivocal ascent above the designated benchmark augurs well for the predictive relevance enshrined within the study.

The table above, meticulously curated to encapsulate the Q-square values, stands as a beacon of confirmation. Its cells, populated with numerical indices, echo a resounding affirmation of predictive relevance. This tableau serves as a visual testament to the model's efficacy in foretelling outcomes, thereby fortifying the research endeavour. As the numerical values in the table coalesce to affirm predictive relevance, their imprint extends far beyond numeric indices. This confirmation heralds a validation of the model's ability to transcend the realms of explanation and venture into the terrain of prediction, a hallmark achievement in the landscape of empirical inquiry. The resolute confirmation of predictive relevance, as articulated in Table

37, carries profound implications for the model's overall validity. It underscores not only the theoretical robustness ingrained in the study but also the pragmatic utility of the model in extrapolating and anticipating outcomes. As the study charts its trajectory forward, armed with the imprimatur of predictive relevance, the onus lies on anchoring predictive precision. Future iterations of the model can draw inspiration from the nuanced insights gleaned through Q-square analysis, steering the course towards heightened accuracy and foresight.

6.4.4 F – Squared

The F-square analysis, a nuanced exploration into the interplay of constructs, offers a granular perspective on the strength and impact of each construct on its counterparts. As the numerical tableau unfolds, each entry represents a distinctive facet of the intricate relationships governing the model.

Table 37: F – Squared

Constructs	f-square	Interpretation
EC -> STA	6.132	EC -> STA: A Dominant Influence (F-square = 6.132) The relationship between EC and STA emerges as a standout, with an F-square value of 6.132. This numerical insignia signifies a profound and dominant influence of EC on STA, suggesting a pivotal role in shaping the dynamics of the construct STA.
GAM -> EC	0.004	GAM -> EC: Minimal Impact (F-square = 0.004) In contrast, the impact of GAM on EC is notably modest, as indicated by the marginal F-square value of 0.004. This suggests that the construct GAM exerts minimal influence on the dynamics of EC within the model.
IQ -> EC	0.132	IQ -> EC: Moderate Influence (F-square = 0.132) The interplay between IQ and EC reveals a moderate influence, with an F-square value of 0.132. This signifies a discernible yet restrained impact of IQ on the construct EC.

PA -> SRT	0.329	PA -> SRT: Substantial Impact (F-square = 0.329) The relationship between PA and SRT unfolds with a substantial impact, encapsulated by an F-square value of 0.329. This points to the significant role played by PA in shaping the dynamics of SRT.
PA -> TR	0.000	PA -> TR: Negligible Impact (F-square = 0.000) In stark contrast, the influence of PA on TR appears negligible, with an F-square value of 0.000. This implies that PA exerts minimal impact on the construct TR within the model.
PE -> MBA	0.078	PE -> MBA: Moderate Influence (F-square = 0.078) The dynamics between PE and MBA reflect a moderate influence, underscored by an F-square value of 0.078. This suggests a discernible yet measured impact of PE on the construct MBA.
PI -> TR	0.010	PI -> TR: Limited Influence (F-square = 0.010) The impact of PI on TR appears limited, as denoted by the modest F-square value of 0.010. This implies a constrained influence of PI on the dynamics of TR within the model.
PS -> MBA	0.017	PS -> MBA: Minor Impact (F-square = 0.017) The relationship between PS and MBA unfolds with a minor impact, indicated by the F-square value of 0.017. This suggests a subtle influence of PS on the construct of MBA.
PSD -> TR	0.048	PSD -> TR: Moderate Influence (F-square = 0.048) The interplay between PSD and TR reveals a moderate influence, as signified by the F-square value of 0.048. This denotes a discernible yet restrained impact of PSD on the construct TR.
SQ -> EC	0.502	SQ -> EC: Dominant Influence (F-square = 0.502)

		The relationship between SQ and EC emerges as particularly impactful, with an F-square value of 0.502. This underscores the dominant influence of SQ on the dynamics of EC.
SRT -> STA	0.001	SRT -> STA: Minimal Impact (F-square = 0.001) In contrast, the impact of SRT on STA appears minimal, with an F-square value of 0.001. This implies that SRT exerts negligible influence on the construct STA within the model.
STA -> CU	1.689	STA -> CU: Substantial Influence (F-square = 1.689) The dynamics between STA and CU unfold with a substantial influence, encapsulated by an F-square value of 1.689. This points to the significant role played by STA in shaping the construct of CU.
STA -> TR	0.854	STA -> TR: Influential Impact (F-square = 0.854) The influence of STA on TR is notably influential, as denoted by the substantial F-square value of 0.854. This signifies a pivotal role played by STA in shaping the dynamics of TR.
TR -> MBA	0.052	TR -> MBA: Limited Impact (F-square = 0.052) The impact of TR on MBA appears limited, with an F-square value of 0.052. This suggests a restrained influence of TR on the construct MBA within the model.
TTF -> MBA	0.075	TTF -> MBA: Moderate Influence (F-square = 0.075) The dynamics between TTF and MBA reflect a moderate influence, underscored by an F-square value of 0.075. This suggests a discernible yet measured impact of TTF on the construct MBA.

The F-square analysis unfolds as a comprehensive guide to the intricate tapestry of construct dynamics. The varied impacts, ranging from dominant to negligible, weave a narrative of interdependence and influence within the model. These insights pave the way for nuanced

adjustments and refinements, steering the research endeavour towards a more finely calibrated and substantiated framework.

6.5 CONCLUSION

Chapter 6 summarised the conclusions from the primary data gathered on the variables influencing Millennials and Gen Z's continuous use of mobile banking. The descriptive statistics of the data are first presented in the chapter, and then the CFA analysis is used to assess the data's validity and reliability. CFA is also used for the model fit assessment, which is an important step in determining whether the data are appropriate for the study model. The final section of the chapter describes the structural model analysis, which includes model fit and hypothesis tests. The analysis's findings provide light on the interplay between variables that affect Millennials and Gen Z's continuous use of mobile banking. The study's conclusions are essential for the banking sector and policymakers who want to increase Millennials' and Gen Z's continuous use of mobile banking. The results of the study will be expanded upon in the next chapter based on the conclusions presented in this one. The study's ramifications for the banking industry, policymakers, and academics will be covered in greater detail. Additionally, the chapter will offer suggestions for additional banking-related research. Overall, the research's findings help us better understand how innovation might improve Millennials' and Gen Z's continuous use of mobile banking.

CHAPTER 7: PRESENTATION OF FINDINGS

7.1 INTRODUCTION

This chapter delves into the study's findings, drawing insights from the results outlined in Chapter 6 and aligning them with the overarching study objectives. Additionally, it scrutinises how these findings resonate with the existing body of literature. The focus here is to evaluate whether the study objectives and research problems have been adequately tackled and to explore the significance and relevance of the research results. In essence, this chapter serves as a reflective analysis, bridging the gap between the study's objectives and the tangible outcomes presented in the preceding chapter.

7.2 DISCUSSION ON THE ACHIEVEMENT OF EMPIRICAL OBJECTIVES

7.2.1 Recap of the empirical objectives

In light of the findings presented in Chapter 6, this section revisits the study objectives to assess their achievement. The discussion revolves around an evaluation of these objectives concerning the hypothesised conceptual model for the study. Furthermore, the comparison extends to the existing literature, providing a contextual framework for understanding the outcomes. By scrutinising the alignment between the study objectives, the hypothesised conceptual model, and relevant literature, this analysis aims to offer a comprehensive perspective on the study's accomplishments and their broader implications.

7.2.2 Objective 1: To investigate personal factors and task technology fit on the adoption of mobile banking apps.

Building on the data and identified relationships in the study, the continuous use of mobile banking apps is explored in the context of personal factors, particularly in correlation with task technology fit. This exploration is substantiated through the empirical investigation of hypotheses H(1) and H(2).

Mobile App Interactive Quality:

In the contemporary landscape, the provision of desired and relevant products and services across various industries necessitates effective communication between consumers and artificial intelligence (AI) (Araujo, 2018). The prevalence of AI devices engaging in automated conversations is on the rise (Pelau et al., 2021). Notably, interactivity emerges as a key predictor of consumer engagement and confirmation within mobile applications or chatbots (Ashfaq et al., 2020).

Mobile App Service Quality:

Service quality is a pivotal facet of consumers' attitudes, shaped by a prolonged evaluation of mobile commerce service or product performance (Phuong & Dai Trang, 2018). The significance of service quality is underscored by its role in conferring a competitive advantage and long-term success to businesses (Jain, Kaul, & Sanyal, 2021). Tang, Zhang, and Akram (2019) further emphasise the instrumental role of mobile apps in sustaining product or service expectations, thereby influencing usage continuance. When consumers experience the confirmation of their expectations through the utilisation of a mobile banking app, satisfaction ensues, and the product or service is perceived as relevant (Gupta et al., 2021).

These insights illuminate the interconnected dynamics between personal factors, task technology fit, and the continuous use of mobile banking apps. Financial institutions are encouraged to prioritise and optimise the interactive and service quality dimensions of their mobile applications, aligning them with users' expectations for enhanced satisfaction and sustained usage.

7.2.3 Objective 2: To investigate trust in mobile banking apps on adoption.

Through an examination of its association with use adoption, the study explores the connection between trust and the continued utilisation of mobile banking apps. This exploration is substantiated through the empirical investigation of hypotheses H(14) and H(15). The research landscape, as outlined by Arfi et al. (2021), emphasises the critical part of trust in technology services provided by smart devices. These services involve the collection, management, monitoring, and analysis of individuals' data, giving rise to significant security and trust concerns that can impact consumers' adoption of such services. In essence, trust becomes a pivotal factor influencing the acceptance and continued use of technology-driven services.

Consumer satisfaction, as elucidated by Cheshin et al. (2018), is contingent upon the alignment of usage outcomes with perceived performance and expectations. When consumers perceive the performance of an adopted product or service as superior, their satisfaction levels are elevated. Notably, trust plays a foundational role in driving satisfaction with mobile banking products and services. The banking industry, therefore, must prioritise the establishment of consumer trust through offerings that are perceived as trustworthy (Thusi & Maduku, 2020). These findings underscore the interconnectedness of trust, satisfaction, and continuous use in the realm of mobile banking. Financial institutions are urged to cultivate a trustworthy image, ensuring that users have confidence in the security and reliability of mobile banking apps. This, in turn, contributes to heightened user satisfaction and fosters a conducive environment for the sustained adoption of these technological offerings.

7.2.4 Objective 3: To investigate experiential and functional factors on expectation confirmation.

In the context of mobile banking apps, the study delves into the relationship between gamification and expectation confirmation, revealing a significant negative correlation (H4). The findings suggest that, when applied to mobile banking, gamification may not align with users' expectations, leading to a negative impact on expectation confirmation.

The negative relationship implies that incorporating game-like elements in the mobile banking experience might not meet users' anticipated expectations. Users, it seems, may prefer a more straightforward and functional experience without the added complexities associated with gamified elements (Rahi & Ghani, 2019). This insight underscores the importance of aligning features and functionalities with users' expectations and preferences in the banking industry (Wut, Ng, Leung & Lee, 2021). For financial institutions, especially in the realm of mobile banking app development, this finding suggests that while innovation and creativity are valuable, they need to be implemented thoughtfully (Rahi & Ghani, 2019).

7.2.5 Objective 4: To determine the influence of expectation confirmation, mobile banking app adoption and social response on mobile banking app satisfaction.

The current study sheds light on the interconnected relationships between Expectation Confirmation, Satisfaction (H7), and Adoption (H15), providing valuable empirical insights.

Expectation Confirmation Theory in Information Systems (ECT-IS):

According to Zhou et al. (2018), the ECT-IS theoretical framework suggests that three important post-acceptance variables user satisfaction, confirmation of expectations, and post-usage perceived usefulness have an impact on a user's intention to stick with an information system-driven artefact.

Components of Expectation Confirmation Theory:

Confirmation of Expectations: Consumers form expectations regarding the benefits of a product or service, and confirmation occurs when their actual experiences align with these pre-existing expectations (Ambalov, 2018).

Satisfaction:

An essential component of ECT-IS is emotional reaction, which is measured by satisfaction. It expresses how satisfied a consumer is with the product or service overall and has a big impact on whether they decide to keep using it (Ambalov, 2018).

The ECT-IS theory aligns with the consumer decision-making process, emphasising the sequential development of expectations, purchase, and post-usage assessment (Osang, 2019). The study suggests that consumers form expectations before purchase, evaluate performance post-purchase, and base their decision to continue usage on the confirmation of expectations (Rabaa'i & AlMaati, 2021).

7.2.6 Objective 5: To investigate mobile banking app satisfaction on continuous use.

The positive correlation found in (H15) indicates that consumer satisfaction is a significant factor in Millennials and Gen Z's continued usage of mobile banking apps in South Africa. Consumers are more likely to stick with the app over time if they are happy with their mobile banking experience.

Satisfaction

The findings resonate with prior research in the field of mobile commerce, where satisfaction has been identified as a key driver of continued usage. Studies, such as those conducted by

Wang, Qing, Saqib Khan, and Khan (2021), have highlighted the importance of satisfaction in shaping consumer intentions and usage behaviour.

These findings highlight how important it is for the banking sector in South Africa to put consumer pleasure first when creating and maintaining mobile banking apps. Long-term usage sustainment, increased levels of user engagement, and loyalty can all be attributed to a great and rewarding user experience.

7.2.7 Objective 6: To explore artificial intelligence features on trust and social response in mobile banking apps.

The connection involving the relationship between Perceived Anthropomorphism and Social Response has been confirmed, as supported by (H11). The Social Response Theory, which posits that individuals perceive computer information systems as social actors and respond to them socially, underlies this relationship (Li & Suh, 2021).

Social Response Theory

Social Response Theory suggests that individuals attribute human-like qualities to technology, a phenomenon known as anthropomorphism. This attribution is influenced by the presence of social cues in the design of technological artefacts, leading to perceptions of social presence (Gnewuch et al., 2018; Diederich et al., 2019). Anthropomorphism, as defined by Lin, Zheng, and Lee (2021), refers to a system behaving like humans during the execution of a service or task. Consumers are naturally inclined to interact more meaningfully with technology when the experience resembles human interaction. This resemblance is achieved through the incorporation of aesthetic cues driven by anthropomorphism (Han, 2021). The study affirms that the availability of social cues contributes to perceptions of social presence, fostering positive consumer perceptions of products and services (Gnewuch et al., 2018; Diederich et al., 2019). Social responses, intertwined with perceptions of anthropomorphism, play a pivotal role in shaping consumer satisfaction with products and services. The study suggests that the more users perceive technology as having human-like qualities and engaging in social interactions, the more positive their overall satisfaction becomes.

7.3 SAMPLE CHARACTERISTICS AND OBSERVATIONS

The study's target participant profile in South Africa consisted of Millennials and Gen Z. However, the majority of participants were female Gen Z members between the ages of 18 and 24, supporting the notion that this generation is mobile native (Ayuni, 2019; Deloitte Digital Consumer Trends, 2012; Tunsakul, 2020). Gen Z offers important insights into how mobile banking apps are used. They are recognised for their digital proficiency and mobile-centric lifestyle. The unintended outcome on gender acknowledges the possibility of gender-specific dynamics. The study's significance is in revealing complex behaviours in a technologically adept population, providing guidance for the banking sector, and laying the groundwork for further investigations into a variety of demographics and comparative evaluations.

7.4 CONCLUSIONS

Restating the study's research problem before completing the objectives is crucial. The way financial services and products are offered has changed due to the increased use of mobile phones and wireless technology (Kinsman, 2019). The South African Customer Satisfaction Index (SA-CSI) for Banking Products (2018) indicates that homogeneous products are a problem in the banking sector. Gaining consumers' loyalty to these products is challenging because they are not distinctive. According to research by Consulta (2019) and the South African Customer Satisfaction Index (SA-CSI) for Banking Products 2018, undifferentiated products harm consumer satisfaction. According to Soubra (2021), consumers have been producing a vast amount of data that reflects their distinctive behaviours due to the global push to digitize financial platforms and technological advancement. According to Marous (2019), the consumer needs of Gen Z (Gen Z 18–24) and Millennials (25–39) have changed, which is responsible for this data growth trend. Over \$3 trillion is spent by Millennials, and adult Gen Z combined (Investec, 2021). Given their combined sheer size, financial organisations have enough reason to start paying attention to how they promote to these generations. The study applied the following theories to achieve the objectives listed below: Task Technology Fit (TTF), Unified Theory of Acceptance and Use of Technology (UTAUT), Expectation Confirmation Theory of Information System Persistence (ECT-IS), Social Response Theory, and Computers as Social Actors (CASA).

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

The study's purpose, the research goals, and the results described in Chapters 6 and 7 come together in this concluding chapter to serve as the foundation for the conclusion. The discussion extends to the implications arising from these findings and their relevance for marketing practitioners and retailers. Subsequently, the chapter unfolds with an acknowledgement of the study's limitations, paving the way for recommendations for future research endeavours. Additionally, a comprehensive overview is provided, highlighting the theoretical, contextual, empirical, and managerial (or practical) contributions made by the study. This synthesis encapsulates the essence of the study, underscoring its broader impact and avenues for future exploration.

8.2 OVERVIEW OF THE STUDY AND KEY FINDINGS

The study's main goal, which is to identify the variables impacting South African Millennials and Gen Z's continuous usage of mobile banking apps, is summarised in this section. Strong theoretical foundations support the investigation: Task Technology Fit (TTF), Computers as Social Actors (CASA), Expectation Confirmation Theory of Information Systems (ECT-IS), Unified Theory of Acceptance and Use of Technology (UTAUT), and Social Response Theory. These frameworks collectively form the conceptual underpinning for the exploration and analysis of the study's primary results. The course of this investigation has been guided by a comprehensive examination of the interplay between technology and user behaviour. In the particular South African context, the study aimed to ascertain the degree to which mobile banking apps satisfy the demands, expectations, and sociotechnical dynamics of the astute Millennials and Gen Z population. The convergence of these theories has allowed for a nuanced and multifaceted exploration, acknowledging the complex web of influences that shape user perceptions and actions. In synthesising the extensive exploration into the variables affecting the continuous utilisation of mobile banking apps among Millennials and Gen Z in South Africa, the study's key findings emerge as follows:

The study's outcomes yield a significant understanding of the intricate dynamics governing the continuous usage of mobile banking apps. Expectation Confirmation and Service Quality emerge as positive drivers, fostering continuous use of mobile banking apps. Conversely, Social Response, Task Technology Fit, and Gamification exhibit a counterintuitive negative relationship, suggesting nuanced user responses in the mobile banking landscape. Trust in the mobile banking app emerges as a linchpin, positively correlated with both Satisfaction and Expectation Confirmation. Furthermore, mobile banking app adoption finds a positive nexus with Task Technology Fit, underscoring the strategic importance of seamless technological integration.

In synthesis, these findings underscore the nuanced interplay between artificial intelligence features and various personal, experiential, and functional factors in shaping the continuous use of mobile banking applications. The objectives of the study, as delineated in the research question – *"To what extent do artificial intelligence features and personal, experiential, and functional factors influence mobile banking applications' continuous use?"* – are unequivocally realised through a rigorous application of theoretical frameworks.

These theoretical frameworks, which include Expectation Confirmation Theory (ECT-IS), Task Technology Fit (TTF), Unified Theory of Acceptance and Use of Technology (UTAUT), Social Response Theory (SRT), and Computers As A Social Actor (CASA), served as the guiding compass for the study.

Each theoretical framework contributed a unique lens through which the multifaceted dimensions of mobile banking application usage were scrutinised. Expectation Confirmation Theory elucidated how Millennials and Gen Z in South Africa preconceived expectations interact with actual experiences, influencing their continuous engagement. Task Technology Fit shed light on the alignment between technological features and users' task requirements, offering insights into the functional aspects impacting usage. Unified Theory of Acceptance and Use of Technology provided a holistic view of factors influencing users' acceptance and continued use. Social Response Theory and Computers As A Social Actor delved into the social and anthropomorphic elements, unravelling the influence of social interactions and perceptions of the mobile banking application.

The theoretical frameworks collectively formed the scaffolding for the research, enabling a comprehensive exploration of both artificial intelligence features and various personal, experiential, and functional factors. By adhering to these theoretical underpinnings, the study ensured a rigorous and systematic approach to data collection, analysis, and interpretation. This theoretical grounding not only fortified the academic robustness of the study but also facilitated a nuanced assessment of the intricate relationships within the realm of mobile banking application usage.

In essence, the study's objectives were achieved by developing a theoretical framework that provided a structured and organised approach to investigating the interplay between artificial intelligence features and diverse user-related factors. The chosen theoretical lenses facilitated a nuanced exploration of the research question, contributing valuable insights to the broader discourse on the mobile banking app's continuous use of Millennials and Gen Z in South Africa.

8.3 RECOMMENDATIONS

The study unfolds a panorama of research findings that carries significant implications for the banking industry in South Africa, particularly in catering to the distinctive needs of Millennials and Gen Zs. These findings beckon thoughtful consideration and prompt strategic recommendations for industry stakeholders.

8.3.1 Influence of Perceived Security on Mobile Banking Adoption

The study's findings reveal a significant and negative relationship between perceived security and mobile banking adoption. In light of these results, the South African banking industry needs to prioritise the establishment of a robust connection with Millennials and Gen Zs. This can be achieved through mobile banking application development that incorporates highly convincing and secure features. In an era where cybersecurity concerns are paramount, addressing and mitigating perceived security risks becomes pivotal for fostering trust and encouraging the adoption of mobile banking services among the younger generations. Financial institutions should invest in state-of-the-art security measures, employ advanced encryption technologies, and communicate these security features transparently to users. By doing so, banks can not only meet the expectations of tech-savvy Millennials and Gen Zs but also instil confidence in the security and reliability of their mobile banking platforms. Furthermore,

continual efforts to stay abreast of evolving security threats and the implementation of proactive security strategies will be instrumental in maintaining a positive relationship with users. The research highlights the significance of security factors in moulding user attitudes and impacting the uptake of mobile banking apps across the younger South African population.

8.3.2 Influence of Performance Expectancy on Mobile Banking Adoption

The results of the study demonstrate a strong and favourable correlation between the use of mobile banking and performance expectancy. As a result, the banking sector in South Africa would have to give priority to and put into practice creative solutions targeted at consistently improving the functionality of mobile banking applications. In a landscape characterised by technological advancements and user expectations for seamless digital experiences, performance expectancy becomes a crucial factor influencing the adoption of mobile banking services. Financial institutions should focus on consistently improving the functionality, speed, and overall user experience of their mobile apps. This may involve regular updates, feature enhancements, and responsiveness to user feedback to ensure that the performance of mobile banking applications aligns with or exceeds the expectations of Millennials and Gen Zs.

Emphasising user-centric design principles, conducting usability testing, and leveraging cutting-edge technologies can contribute to optimising the performance of mobile banking apps. Additionally, the industry should remain agile in adopting emerging technologies that enhance the overall performance and functionality of their applications. By prioritising performance expectancy, the South African banking sector can not only attract but also retain the younger demographic, fostering a positive and enduring relationship with users of mobile banking applications. Continuous innovation and improvement in app performance will position financial institutions as leaders in meeting the evolving expectations of tech-savvy consumers.

8.3.3 Influence of Task Technology Fit on Mobile Banking Adoption

The study highlights the importance of Task Technology Fit (TTF) in determining the adoption of mobile banking and finds a strong and positive correlation. Given this, it is highly recommended that the banking sector in South Africa embrace creative approaches to effectively incorporate technology into mobile banking apps. Task technology fit describes how well a piece of technology fits the tasks or activities it is meant to serve in terms of both

features and functions. Ensuring a strong TTF in the context of mobile banking means that the app's technological features closely match the tasks and requirements of Gen Z and Millennials, offering a user experience that is efficient, intuitive and tailored to their preferences.

To enhance TTF, the banking industry should continually explore and implement cutting-edge technologies that streamline and enhance the user experience. This could involve leveraging artificial intelligence, machine learning, and other emerging technologies to personalize interactions, automate routine tasks, and offer predictive features. User interface and experience design should be informed by a deep understanding of user behaviours, preferences, and the specific tasks users aim to accomplish through mobile banking. Moreover, financial institutions should remain agile and responsive to technological advancements, market trends, and user feedback. Regular updates and improvements to mobile banking apps should be informed by a strategic focus on enhancing TTF to meet the evolving expectations of tech-savvy consumers. By prioritising Task Technology Fit, the South African banking sector can foster greater user engagement, and satisfaction, and ultimately drive increased adoption of mobile banking applications among Millennials and Gen Zs. This proactive approach positions financial institutions as technology leaders and strengthens their competitiveness in the digital banking landscape.

8.3.4 Influence of Gamification on Expectation Confirmation

The study reveals a noteworthy finding regarding the impact of gamification on expectation confirmation within the mobile banking adoption context. The observed significant but negative relationship underscores the need for a nuanced approach to incorporating gamified concepts within mobile banking applications targeted at Millennials and Gen Zs in South Africa. Gamification involves integrating game elements and principles into non-game contexts to enhance user engagement and interaction. In the realm of mobile banking, this could include incorporating game-like features such as rewards, challenges, and interactive elements to make the banking experience more enjoyable and interactive. The negative relationship suggests that, while gamification is a powerful tool for engagement, its effectiveness in the context of expectation confirmation may be influenced by various factors. Financial institutions should, therefore, ensure that gamified elements are not only entertaining but also align with users' expectations and contribute positively to the overall banking experience. To leverage gamification effectively, the South African banking industry is encouraged to understand user

preferences by gaining insights into the preferences and expectations of Millennials and Gen Zs regarding gamified interactions. Tailor gamification strategies to align with their interests and motivations. Banks should ensure that gamified elements serve broader banking objectives and contribute to the achievement of users' financial goals. Striking a balance between entertainment and functionality is crucial. Gamified features should be kept dynamic and updated to maintain user interest. Introduce new challenges, rewards, or interactive components to prevent monotony. By adopting a strategic and user-centric approach to gamification, the South African banking industry can create engaging and relatable experiences that positively contribute to expectation confirmation, ultimately fostering greater adoption of mobile banking applications among the target demographic.

8.3.5 Influence of Mobile Interactive Quality on Expectation Confirmation

The identified positive and significant relationship between mobile interactive quality and expectation confirmation highlights a critical area of focus for the South African banking industry. This finding suggests that efforts to enhance interactive quality within mobile banking applications can contribute positively to users' confirmation of their expectations. South Africa's banking sector needs to prioritise continuous innovation in the interactive features of mobile banking apps. This involves improving the user interface, responsiveness, and overall interactivity of the application. Providing users with a seamless and engaging experience is crucial for confirming their expectations and fostering satisfaction. Additionally, merging improvements in interactive quality with cutting-edge technology is a strategic recommendation. Incorporating features like chatbots, personalised recommendations, or other interactive elements powered by artificial intelligence can elevate the overall interactive quality of mobile banking apps. This aligns with the study's findings, emphasizing the importance of user engagement and interactive features in shaping users' expectations. The banking industry in South Africa should focus on a dual strategy: consistently enhancing the interactive quality of mobile banking apps and integrating technological innovations to create a more engaging and satisfying user experience. This approach is particularly relevant for meeting the preferences and expectations of Millennials and Gen Zs.

8.3.6 Influence of Mobile Service Quality on Expectation Confirmation

A key feature of the South African banking sector is highlighted by the study's considerable positive correlation between expectation confirmation and mobile service quality. It implies

that initiatives to improve and develop the quality of the services offered by mobile banking applications may favourably influence consumers' affirmation of their expectations. Continuous development in the quality of services offered through mobile banking apps should be given top priority by the South African banking sector. This can include the user interface, reaction speeds, accessibility, and general user experience, among other things. The results highlight the significance of service quality in influencing consumer expectations, which is in line with the investment in state-of-the-art technology to provide smooth and effective services.

Moreover, the recommendation to merge service quality improvements with technological advancements emphasises the synergy between service excellence and innovative features. Incorporating emerging technologies, such as artificial intelligence or machine learning, can further enhance user experiences, contributing to the confirmation of expectations. The banking industry's strategic focus should involve a dual approach: consistently elevating service quality standards and integrating technological advancements to meet the evolving expectations of users, particularly among Millennials and Gen Zs in South Africa.

8.3.7 Influence of Expectation Confirmation on Satisfaction

The identified positive and significant relationship between expectation confirmation and satisfaction underscores a pivotal aspect of the South African banking industry. This finding suggests that meeting or exceeding user expectations within mobile banking applications contributes significantly to user satisfaction. To leverage this insight, the banking industry in South Africa should adopt strategies that focus on continuously enhancing user satisfaction. This involves not only meeting the functional requirements of users but also exceeding their expectations in terms of usability, features, and overall performance. Investing in user experience (UX) design, consumer support, and responsiveness can contribute to a more satisfying interaction with mobile banking apps.

Moreover, the recommendation to merge satisfaction improvements with technology aligns with the broader trend of digital transformation. Integrating advanced technologies like artificial intelligence, machine learning, or biometric authentication can elevate the satisfaction levels of users. These technologies can enhance security, hyper-personalisation, and overall mobile banking app efficiency. The banking sector in South Africa needs to put a higher priority on creative approaches that go above and beyond the minimum standards of

satisfaction and strive for a remarkable customer experience. By combining improvements in satisfaction with cutting-edge technology, banks can create mobile banking applications that resonate positively with users, particularly within the Millennial and Gen Z demographic.

8.4.8 Influence of Perceived Artificial Intelligence (AI) on Trust

The identified significant and negative relationship between perceived artificial intelligence (AI) and trust in mobile banking applications highlights a critical consideration for the South African banking industry. This finding suggests that users may harbour concerns or reservations about trusting AI components within mobile banking apps. To address this, the banking industry should prioritise measures that enhance the perceived trustworthiness of AI features in their mobile banking applications. Banks should ensure that AI algorithms and decision-making processes are transparent and explainable to users. Providing clear insights into how AI functionalities operate can demystify the technology and build trust. Implement educational initiatives to inform users about the benefits and safeguards associated with AI in mobile banking. Proactively addressing misconceptions and concerns can contribute to a more positive perception of AI. Highlight the strong security protocols put in place to safeguard user information and financial activities. Explain to users how AI improves security aspects in the mobile banking app. Allow users to customise AI settings according to their preferences. Providing options for users to control and personalise AI-driven features can enhance their sense of control and trust. Adhere to ethical guidelines and best practices in AI development. Demonstrating a commitment to responsible and ethical AI usage can foster trust among users. Establish channels for users to provide feedback and express concerns related to AI features. Actively addressing user feedback demonstrates responsiveness and a commitment to improving the user experience.

Building trust in AI features within mobile banking apps requires a multifaceted approach that combines transparency, education, security, user control, ethical practices, and ongoing communication. By proactively addressing user concerns and ensuring the responsible deployment of AI, the South African banking industry can cultivate a trustworthy environment for users, particularly within the context of mobile banking applications.

8.3.9 Influence of Perceptions of Artificial Intelligence (AI) and Trust

It is crucial to foster a positive perception of AI-driven features in mobile banking applications, as evidenced by the strong and negative association between perceptions of artificial intelligence (AI) and confidence in these apps. Users' general sense of trust in the mobile banking platform can be strongly impacted by their level of confidence in AI technologies. Banks ought to make an effort to emphasise how artificial intelligence (AI) enhances the security of mobile banking transactions. Clearly state the steps taken to preserve user data and guarantee the accuracy of AI-driven procedures. By using these tactics, the banking sector in South Africa might endeavour to increase customer trust by promoting a favourable image of AI in mobile banking apps. Consequently, this can lead to heightened consumer assurance and interaction with AI-powered functionalities within the mobile banking encounter.

8.3.10 Influence of Perceived Anthropomorphism on Trust

The correlation between perceived anthropomorphism and trust in mobile banking applications was shown to be strong and unfavourable, indicating an important issue for the banking sector in South Africa. The extent to which people give non-human objects, such as the user interface or functionalities of mobile banking apps, human characteristics are known as perceived anthropomorphism. The banking sector should concentrate on tactics that raise the perceived reliability of anthropomorphic mobile banking apps to remedy this. These are some suggestions:

Communicate the role and capabilities of anthropomorphic features within the mobile banking app. Users should have a comprehensive understanding of how these features function and contribute to their banking experience. Banks should ensure that anthropomorphic elements are integrated into the app's design in a user-friendly and intuitive manner. Elements such as virtual assistants or chatbots should enhance, rather than hinder, the user experience. Emphasising the robustness of security measures in place to protect user data and maintain the integrity of transactions is important for banks. The users of the mobile banking apps must be informed about the anthropomorphic features and their contribution to the security protocols within the mobile banking app. Implementing educational initiatives to inform users about the benefits and safeguards associated with anthropomorphic features will ensure that users are empowered to interact responsibly with the app. Addressing any misconceptions and concerns can contribute to a more positive perception of these elements. Adhere to ethical design

principles in the development of anthropomorphic features. Actively seek user input to identify areas for improvement and demonstrate a commitment to user satisfaction.

Building trust in mobile banking apps with anthropomorphic features requires a strategic approach that combines clarity in communication, user-friendly design, security assurances, user education, ethical design, feedback mechanisms, and personalisation options. By addressing user concerns and ensuring responsible design practices, the South African banking industry can foster trust in mobile banking apps with anthropomorphic elements.

8.3.11 Influence of Perceptions of Artificial Intelligence (AI) on Trust

The identified significant and negative relationship between perceptions of artificial intelligence (AI) and trust in mobile banking applications underscores the importance of cultivating a positive perception of AI-driven features within these apps. Users' trust in AI technologies can significantly influence their overall trust in the mobile banking platform. Here are strategic recommendations for the South African banking industry to address this relationship: Communicate how AI algorithms operate within the mobile banking app. Emphasise transparency in data processing and ensure users understand how AI-driven functionalities work. Implement explanatory interfaces that demystify AI-driven features for users. Offer in-app guides or tooltips that explain specific AI-driven functionalities. Educate users about the benefits and value added by AI in enhancing the efficiency and personalization of banking services. Develop educational initiatives to inform users about the positive impact of AI on security, fraud prevention, and personalised services. Conduct awareness campaigns to address any misconceptions or fears associated with AI in mobile banking.

8.3.12 Influence of Social Response and Satisfaction

The identified significant but negative relationship between Social Response and user satisfaction suggests that while sociability is an important aspect, certain elements within social responses may impact user satisfaction in a nuanced manner. To address this finding, the South African banking industry should consider the following strategies to establish sociable and satisfying mobile banking apps. Foster positive social interactions within the app by ensuring that features and functionalities are intuitive and user-friendly. Streamline navigation and minimise complexities to create a seamless user experience.

Provide transparent and clear communication through the app's social response features. Ensure that users receive accurate and easily understandable information regarding their transactions, account status, and any interactions within the app. Integrate personalisation options that allow users to customise their social interactions within the app. Empower users to set preferences for the type and frequency of social responses they receive. Implement responsive and efficient customer support channels within the mobile banking app. Ensure that users can easily seek assistance and receive timely responses to their queries or concerns. Provide users with control over social features, allowing them to opt in or out of certain social interactions. Respect user preferences regarding the level of sociability they desire within the app.

By implementing these strategies, the banking industry in South Africa can transform the negative relationship between Social Response and user satisfaction into a positive one. Balancing sociability with user satisfaction is crucial for creating a mobile banking app that not only fosters social interactions but also meets users' expectations for a satisfying and efficient financial experience.

8.3.13 Influence of Satisfaction on Trust

The necessity of providing a great and meaningful user experience to foster trust is highlighted by the positive and significant association between user satisfaction and trust in the mobile banking app. To capitalise on this relationship and further enhance user satisfaction and trust, the South African banking industry should consider implementing the following strategies:

Prioritise the design and functionality of the mobile banking app to ensure a seamless and user-friendly experience. Streamline navigation, reduce loading times, and optimize the app's performance to enhance overall usability. Communicate transparently with users about their transactions, account information, and any changes within the app. Provide clear and easily understandable notifications and alerts to keep users informed. Strengthen security features within the app to instil confidence in users regarding the safety of their financial information. Implement robust authentication methods and regularly update security protocols.

Offer responsive and efficient customer support channels directly within the mobile banking app. Ensure users can easily reach out for assistance, and address their queries or concerns promptly. Integrate personalisation options that allow users to tailor their app settings

according to their preferences. Provide customisation features for alerts, notifications, and user interface elements. Include educational resources or tutorials within the app to guide users on maximising the app's features. Enhance users' understanding of security measures and best practices for safe mobile banking. Commit to regular updates and improvements based on user feedback and emerging trends. Demonstrate a dedication to keeping the app current, secure, and aligned with evolving user expectations. Communicate the app's privacy policies and data protection measures to users. Establish trust by being transparent about how user data is handled and secured. Encourage users to provide feedback on their experiences with the app. Implement incentives or rewards for users who actively contribute constructive feedback. Foster a sense of community within the app by creating forums or discussion groups. Allow users to share positive experiences and tips, building trust among the user community. Implement features that encourage regular engagement with the app, such as promotions, rewards, or interactive content. Keep users actively involved to maintain satisfaction and trust.

By incorporating these strategies, the banking industry in South Africa can leverage the positive relationship between user satisfaction and trust, ultimately creating a mobile banking app that not only satisfies users' needs but also instils trust in the platform as a secure and reliable financial tool.

8.3.14 Influence of Trust on Mobile Banking App Adoption

The identified negative relationship between trust and mobile banking app adoption suggests an intriguing dynamic that requires careful consideration. To address this relationship and promote greater mobile banking app adoption, the South African banking industry should consider implementing the following strategies such as investment in transparent communication to build trust with potential users. Communicate the security measures in place and highlight the safety of using the mobile banking app. Implement educational initiatives within the app to inform users about the security features and benefits of mobile banking. Provide tutorials, FAQs, or interactive guides to address common concerns related to security. Ensure the reliability of the mobile banking app by minimising downtime, glitches, or errors. Regularly update and test the app to maintain a high level of performance and functionality. Optimise the user interface to be intuitive and user-friendly, reducing any potential confusion or frustration during app interactions. Implement features that enhance accessibility for users of varying technological expertise. Implement strong and secure authentication methods to

protect user accounts and instil confidence in the safety of personal information. Communicate the effectiveness of these security measures to users. Establish channels for user feedback within the app to allow users to express their concerns and suggestions. Actively respond to feedback and demonstrate a commitment to addressing user concerns promptly. Introduce multi-layered security protocols to provide users with additional reassurance. Explore biometric authentication options and other advanced security features. Seek partnerships with reputable security firms or organisations to obtain endorsements or certifications. Display such endorsements prominently within the app to enhance its credibility.

Offer incentives or rewards for users who adopt and regularly use the mobile banking app. Promotions, discounts, or exclusive features can serve as motivators for users to embrace the app. Communicate and demonstrate a commitment to user privacy through easily accessible privacy policies. Assure users that their data will be handled responsibly and ethically. Showcase positive testimonials and experiences from existing users within the app. Highlight success stories that emphasise the positive impact and security of using the mobile banking app. Establish ongoing communication with users through regular updates, newsletters, or alerts. Keep users informed about security enhancements, new features, and any measures taken to address potential concerns.

By actively addressing the negative relationship between trust and mobile banking app adoption, the banking industry in South Africa can create an environment where users feel confident and secure regarding the utilisation and adoption of mobile banking apps for their financial needs.

8.4.15 Influence of Satisfaction on Continuous Use

For the South African banking sector, the significant and advantageous correlation involving satisfaction and consistent usage of mobile banking apps offers insightful information. To leverage this relationship and encourage sustained usage, the industry can regularly assess user feedback to identify areas for improvement in the mobile banking app. Implement updates and enhancements to address user preferences and evolving needs. Prioritise a user-centric design approach to ensure the app remains intuitive and easy to navigate. Conduct usability testing to identify and rectify any user experience challenges. Introduce personalised features within the

app to cater to individual user preferences. Allow users to customise their dashboard, set preferences, and receive personalised recommendations.

Banks should consider establishing a responsive consumer support system to address user concerns and issues promptly. Communicate effectively during service disruptions, providing timely updates and resolutions. Stay abreast of technological advancements and industry trends to introduce innovative features. Offer new services and functionalities that enhance the overall banking experience. Provide in-app tutorials and guides to educate users on advanced features or lesser-known capabilities. Empower users with the knowledge to maximize the app's potential.

Implement loyalty programs, rewards, or incentives for users who consistently engage with the app. Offer exclusive benefits or discounts to encourage ongoing usage. Ensure seamless integration with other digital platforms and services that users frequently utilise. Foster a connected ecosystem to enhance the overall convenience for users.

Continuously optimise the app's performance to minimise loading times and ensure smooth functionality. Conduct regular performance assessments and address any bottlenecks. Emphasise and reassure users about the robust security measures in place to protect their data. Communicate the app's commitment to privacy and data protection. Implement periodic surveys to gather insights into user satisfaction and expectations. Act on feedback received to align the app's features with user preferences. Foster a sense of community among app users through forums, discussion boards, or social media groups. Encourage users to share tips, experiences, and best practices. Keep users informed about upcoming features, updates, and improvements through regular communication channels. Highlight the benefits and value additions to maintain user interest. By prioritising user satisfaction and emphasising continuous improvement, the South African banking industry can cultivate a loyal user base that consistently engages with and relies on mobile banking apps for their financial activities.

8.4 CONTRIBUTIONS OF THE STUDY

8.4.1 Theoretical contributions

Mobile banking has become an essential aspect of the banking industry, with a significant number of consumers using it for their financial transactions. The banking industry has

undergone a substantial transformation as a result of the rise of mobile banking, and banks that innovate will have a better chance of surviving, performing better, growing, and gaining market share (YuSheng & Ibrahim, 2019; Purohit, Arora, & Paul, 2022). The use of mobile banking apps has previously been called for an investigation, but there hasn't been enough empirical study or supporting data (Karjaluoto, Shaikh, Saarijärvi & Saraniemi, 2019; Merhi, Hone & Tarhini, 2019; Thusi & Maduku, 2020). As a result, this study suggested an integrated conceptual model that could serve as a framework for the variables impacting Millennials and Gen Z's continued usage of mobile banking. The Unified Theory of Acceptance and Use of Technology (UTAUT), the Expectation Confirmation Theory of Information System Continuity (ECT-IS), the Task Technology Fit (TTF), the Social Response Theory (SRT), and the Computer as Social Actors (CASA) served as the theoretical foundation for the conceptual model.

According to the UTAUT, four constructs performance expectancy and perceived security impact how people accept and use technology (Almutairi et al., 2022; Al-Fahim et al., 2021). According to the ECT-IS, the user's expectation confirmation benefits their decision to keep using the technology (Humbani & Wiese, 2019). According to the TTF, using technology influences both task qualities and technological aspects. According to the SRT theory, a user's conduct is influenced by how they perceive their social environment. The CASA also suggests that people engage with computers according to social standards because they see them as social actors.

The conceptual model also proposed several constructs. The constructs are known as perceived artificial intelligence, perceptions of AI service delivery, perceived anthropomorphism, social response theory, perceived security, performance expectancy, task technology fit, gamification, mobile app interactive quality, mobile app service quality, expectation confirmation, trust in mobile banking app, mobile banking app adoption and mobile banking app satisfaction. They help reinforce the relationship impacting Millennials and Gen Z's continued mobile banking usage. This study significantly contributes to the literature by showing that these constructs have complete mediating effects. The study adds knowledge on mobile application innovation, retail bank marketing, and consumer behaviour. Because of the additional information being created about the factors influencing Millennials and Gen Z's continuous use of mobile banking, the academic community will access these new insights. In particular, in this period where rising market competitiveness is challenging, the new insights collected will boost understanding of the elements impacting mobile banking's continued use.

8.4.2 Practical contributions

The study's findings offer banks and other financial institutions practical advice on enhancing mobile banking offerings and boosting app uptake and usage. The advantages of the study's conclusions are discussed in the following subsections. Other financial institutions, the banking industry, and those who make banking policy will all benefit from this study.

8.4.2.1 Policymakers

Regulators and policymakers can utilise the results of this study to develop guidelines and regulations that financial institutions must follow to enhance their mobile banking services. Policymakers can promote mobile banking apps by fostering a supportive climate encouraging innovation and competition in the banking sector. Policymakers can achieve this by offering financial institutions that invest in mobile banking technology incentives, such as tax savings. Additionally, policymakers can work with the banking sector to create legal frameworks that safeguard the security and privacy of mobile banking users. To guarantee that they fulfil consumers' demands and expectations, they might also establish standards for the dependability and quality of mobile banking apps.

8.4.2.2 The Banking Industry

The study's ability to shed light on the elements influencing Millennials and Gen Z's continued use of mobile banking apps represents one of its most valuable contributions to the banking sector. With the help of these insights, financial institutions may create mobile banking applications that satisfy the demands and expectations of their users and boost uptake and recurrent use. These insights can also be applied to develop mobile banking apps catering to Millennials and Gen Z's wants and expectations, increasing consumer satisfaction and loyalty.

The inclination of Gen Z and Millennials for mobile technology is one of the drivers of the banking sector's rapid digital transformation. Mobile banking apps are an essential part of modern financial services since these generations seek banking solutions that are secure, individualised, and convenient. Futures and scenario planning are strategic tools that banks may employ to foresee and successfully address these digital natives' continuous use of mobile banking apps. This strategy gives banks a framework to remain competitive, relevant and cater to this segment efficiently by enabling improved forecasting of trends, technology disruptions, and changing consumer behaviours.

Forecasting possible changes and developing plans to get ready for various futures are both part of futures planning. In contrast, scenario planning is concerned with developing narratives around a range of conceivable future events (Timilsina, Nakagawa & Kotani, 2020). By taking into account elements including evolving consumer expectations, legislative changes, and technology breakthroughs, both methods assist organisations in testing strategies against a variety of potential outcomes. These technologies allow banks to develop flexible, forward-thinking plans that take into consideration the long-term effects of breakthroughs and trends like open banking, blockchain, 5G, and artificial intelligence (AI), all of which are expected to have an impact on the future of mobile banking.

Possible future possibilities for mobile banking apps can be created by banks:

- Scenario 1: Emergence of hyper-personalised banking

The emergence of the hyper-individualized bank is scenario one. Banks will be data-driven, AI-enhanced organisations that provide real-time, individualised financial advice in this era. Banks can automatically suggest investments, assist with personal financial management, and predict the spending patterns of Gen Z and Millennials with predictive analytics.

- Scenario 2: Dominance of the Open Banking Ecosystem

Open banking laws make it easier for third-party apps to communicate with banks, resulting in an ecosystem where mobile banking apps act as hubs for integration with a range of financial and non-financial services, such as ride-sharing and insurance apps. In this situation, users use financial services without ever opening their banking apps directly, giving priority to app interoperability.

- Scenario 3: Privacy First Banking

This scenario imagines a future in which consumers expect banks to place a high priority on security, privacy, and transparency due to growing worries about data privacy and cybersecurity. Strong encryption and zero-knowledge protocols must be given top priority in this case, and mobile banking apps should minimise data collection while providing features like decentralised identity verification to foster consumer trust.

- Scenario 4: Integration of Digital Currency

As private and state-backed digital currencies proliferate, mobile banking apps need to make it easy to handle a variety of cryptocurrencies. Banks will need to establish themselves as reliable custodians of digital currency, as Gen Z in particular may spearhead the transition to totally digital financial systems.

8.4.2.3 Other Financial Institutions

The usefulness of this study to other financial institutions lies in its capacity to shed light on the variables influencing Millennials and Gen Z's continued use of mobile banking apps. These data can be used by other financial institutions, like credit unions, insurance providers, and investment businesses, to create mobile apps that cater to their consumers' requirements and expectations, hence boosting adoption and continued use. To improve consumer satisfaction, involvement, and advocacy among its patrons, these institutions can use the study's findings to create a great consumer experience and offer top-notch customer service. They can also work with technological businesses to provide cutting-edge solutions that satisfy their consumers' changing needs.

This study also emphasised the significance of security and trust for the uptake and continued usage of mobile banking. To comply with industry data protection and privacy requirements, other financial institutions must ensure their mobile apps are safe. The security aspects of their mobile apps must also be made known to their users, and they must offer assistance in the event of fraud or security breaches. Financial institutions can use the findings from this study to create marketing plans that successfully target Millennials and Gen Z. To draw in and keep these consumers. These techniques might highlight their mobile apps' unique qualities and advantages, like gamification, social interaction, and ease.

In conclusion, this study's practical contributions can aid regulators and the banking sector in improving their mobile banking services, boosting uptake and recurrent use among Millennials and Gen Z, and eventually enhancing the banking industry's competitiveness. Other financial institutions can benefit from the study's findings by using them to develop innovative solutions, create favourable consumer experiences, and provide excellent consumer service to encourage Millennials and Gen Z to use their mobile apps.

8.5 LIMITATIONS OF THE STUDY

The goal of the study was to evaluate the factors influencing Gen Z and Millennials' ongoing usage of mobile banking. This study has shortcomings despite making important theoretical and practical advancements. The study's potential lack of demographic diversity is the first drawback. The study implies that the conclusions are restricted to this context because it only focuses on certain generations, Millennials and Gen Z, and does not represent the other generations. The findings may not be as generalisable to different age groups or people. Second, using a survey as the sole data-gathering technique could have limitations for the study. The variables influencing the continuous use of mobile banking apps by Millennials and Gen Z can be better understood using various data collection techniques. Third, the study might be constrained by a lack of participant follow-up. For instance, the survey might gather information at a particular time point, which does not give any insight into how people use mobile banking apps has changed over time. Following up with participants can help us understand the variables influencing Millennials and Gen Z's continuous use of mobile banking apps. Fourth, the study can include social desirability bias that limits it. In contrast to their actual beliefs and practices, participants may give responses representing social norms and values. As a result, the study's validity and the reliability of the findings may be compromised.

8.6 SUGGESTIONS FOR FUTURE RESEARCH

Examining additional banking products, such as investing, retirement planning, and savings, could be included in the study's extended scope. In addition to improving the data's generalisability, doing this would give researchers a more profound knowledge of the variables influencing Millennials and Gen Z's use of mobile banking. Future research could replicate the findings in other industries, such as insurance or different facets of the financial sector. Insights into the variables influencing the use of mobile apps across various financial industries would be gained from this, along with a chance to spot recurring themes.

A mixed-method approach might offer a more nuanced comprehension of the elements that affect Millennials' and Gen Z's' continuous use of mobile banking. Researchers could learn more about the causes of the trends in the quantitative data by combining quantitative and qualitative data collection techniques. This could assist banking and financial institutions in creating more successful strategies for encouraging the use of mobile banking among various demographic groups. Evaluating the viewpoint of small independent retailers, financial institutions may be able to determine the elements that affect their adoption of mobile banking

technology and their interactions with consumers. This could make it easier to spot areas where mobile banking usage among small businesses, frequently ignored in research on the topic, could be improved. Examining intermediaries, such as communication and information sharing, may reveal the mechanisms that continually influence Millennials and Gen Z to use mobile banking. Researchers could assist banking and financial institutions in creating more successful strategies for increasing the use of mobile banking by pinpointing the elements that support the relationship between retailer innovation and consumer engagement.

Further investigation into other constructs, such as awareness, perceived value, perceived control and perceived risk as mediators, could aid in a deeper understanding of the factors influencing Millennials and Gen Z's ongoing use of mobile banking. Researchers could assist banking and financial institutions in creating more successful strategies for boosting the use of mobile banking by pinpointing the elements that support the link between consumer innovation and consumer pleasure. A more thorough understanding of the variables influencing Millennials and Gen Z's continuous use of mobile banking may result from tackling these topics in future research. This could aid the banking and financial institutions in creating more potent tactics to encourage mobile banking use and enhance the user experience for their clients.

Generational theory should be considered for future studies, for the reasons that extrapolating results across various South African communities is challenging. Because of the country's great economic, social, and cultural variety, Gen Z and Millennials cannot be viewed as monolithic groups. Particularly between urban and rural regions, there are significant differences in factors like access to technology, educational gaps, and wealth disparity. As a result, results on the consistent use of mobile banking apps might not accurately reflect the actions of people in lower-income or more marginalised communities.

8.7 CONCLUDING REMARKS

In conclusion, this study sought to identify the variables determining Gen Z and Millennials' sustained usage of mobile banking applications. Many factors that significantly influence the adoption of mobile banking across a range of demographic categories were discovered through a quantitative survey with 505 participants. The continuing usage of mobile banking was strongly predicted by several parameters, including artificial intelligence, acceptance, and curation of mobile banking apps. The study's conclusions have significant implications for banks and financial institutions hoping to get Millennials and Generation Z to frequently

download and utilize mobile banking apps. The banking should specialise in creating dedicated, user-friendly, easy-to-use mobile banking apps. Furthermore, the study advises financial organisations to concentrate on increasing consumer trust, as this factor was a significant predictor of mobile banking usage. This can be done by being open and honest about security and privacy precautions and ensuring the app is user-friendly and free of technical issues. The banking industry ought to focus on developing dedicated, user-friendly mobile banking apps. Moreover, the study suggests that financial institutions focus on boosting customer trust because it is a key predictor of the use of mobile banking. This can be achieved by being open and honest about security and privacy precautions and ensuring the app is user-friendly and free of technical issues. The study recommends that financial institutions continually enhance the mobile banking app considering user input and developing technologies. This helps ensure that the app remains relevant and practical for users over time and can encourage continued app use. Overall, this study offers insightful information about the variables influencing Millennials and Gen Z's continuous use of mobile banking. The banking may improve the user experience and boost consumer satisfaction by addressing these concerns and developing more effective tactics for encouraging the acceptance and continuous usage of mobile banking apps within various demographic groups.

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APPENDICES

Appendix A: Participant Information Sheet

Greetings,

My name is Neo Mashishi, and I am a Master's student in the field of Business Science (Marketing) at the University of the Witwatersrand, Johannesburg. As part of my studies, I have to undertake a research project which investigates; Mobile banking app curation: Assessing the factors that influence mobile banking's continuous use amongst Millennials and Gen Z under the supervision of Dr Melissa Zulu. This research project aims to provide insights to marketing practitioners and the banking industry on how to curate mobile banking apps that compel the Millennials and Gen-Z cohorts to engage and continue to use them. This will help guide the formulation and positioning of marketing strategies. As part of this project, I would like to invite you to take part in answering a questionnaire. This activity will involve answering questions online and will take around 15 minutes.

You will have no personal costs should you participate in this project. You will not receive any direct benefits from participation but there are no disadvantages or penalties if you do not choose to participate or withdraw from the study. If you experience any distress or discomfort at any point in this process, you are welcome to stop the questionnaire or resume another time. The questionnaire will be completely confidential and anonymous as I will not be asking for your name or any identifying information. The information you provide will be held securely and not disclosed to anyone else. If you have any questions during or afterwards about this research, feel free to contact me at the details listed below. This study will be written up as a research report which will be available online through the university library website. If you wish to receive a summary of this report, I will be happy to send it to you. With your permission the data collected from this research project may be used by other researchers in an anonymised format. If you have any concerns or complaints regarding the ethical procedures of this study, you are welcome to contact the University Human Research Ethics Committee (Non-Medical), by telephone at +27(0) 11 717 1408, email hrecnon-medical@wits.ac.za

Yours sincerely,

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Thank you in advance for your response.

November 2022

Appendix B: Survey Questionnaire

SECTION A: SCREENING QUESTION

SQ 1: Do you have a banking account?

Yes	
No	

SQ 2: Do you have a mobile banking app?

Yes	
No	

SQ 3: Which generation cohort describes you?

Gen Z (18-24)	
Millennial (25-39)	

SECTION B: DEMOGRAPHIC INFORMATION OF THE PARTICIPANTS

This section seeks background information about you. This information will be used for research purposes only. Please indicate your answer by selecting the appropriate answer.

DI1: Which sex describes you?

Male	
Female	
Non-Binary	
Prefer Not to Say	

DI2: Please indicate a province which you reside in.

Gauteng	
Free State	
KwaZulu Natal	
Limpopo	

Eastern Cape	
Northern Cape	
North West	
Mpumalanga	
Western Cape	

DI4: Please indicate your highest academic qualification.

High School	
Diploma	
Bachelor's Degree	
Postgraduate degree	
PhD	
Other	

DI5: Please indicate your monthly income.

R10k -R25k	
R26k -R45k	
R46 +	

DI6: How many banking accounts do you have?

1	
2	
3 +	

DI7: Which bank holds your primary banking account?

Absa Bank	
FNB	
Nedbank	
Standard Bank	
Investec	

DI8: How many mobile banking apps do you have?

1	
2	
3 +	

DI9: Which of the following mobile banking services do you use?

Please select all that apply.

Check account balance.	
Transfer money between accounts.	
View statements	
Pay bills	
Learn about banking and financial products and services	

Mobile Banking App Curation

SECTION B: TRUST IN MOBILE BANKING APP

Please indicate the extent to which you agree or disagree with the following statements by selecting your chosen number, where 1 = strongly disagree and 5 strongly agrees.

Trust in Mobile Banking App		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
TR1	The mobile banking app offers a secure medium through which personal information can be shared confidentially.	1	2	3	4	5
TR2	The mobile banking app is trustworthy.	1	2	3	4	5
TR3	The mobile banking app keeps its promises.	1	2	3	4	5

TR4	I am willing to transact through the mobile banking app.	1	2	3	4	5
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SECTION C: MOBILE BANKING ADOPTION

Mobile Banking Adoption		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
MBA1	I intend to continue using mobile banking apps in the future.	1	2	3	4	5
MBA2	I will always try to use mobile banking apps in my daily transactions.	1	2	3	4	5
MBA3	I plan to continue using mobile banking apps frequently.	1	2	3	4	5
MBA4	I plan to continue using mobile banking apps for my transactions.					

SECTION D: MOBILE APP SATISFATION

Mobile App Satisfaction		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
SAT1	Considering all things, I am very satisfied	1	2	3	4	5

	with the mobile banking app.					
SAT2	Overall, the content of the mobile banking app satisfies my initial expectation (What I had expected).	1	2	3	4	5
SAT3	Overall, I am happy with the performance of the content.	1	2	3	4	5
SAT4	I am happy with the mobile banking app.	1	2	3	4	5

SECTION E: MOBILE BANKING APP CONTINUOUS USE

Mobile Banking App Continuous Use		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
CU1	I will continue to use the mobile banking app in the future.	1	2	3	4	5
CU2	I will continue to use the mobile banking app rather than discontinue using it.	1	2	3	4	5
CU3	I will continue to use the	1	2	3	4	5

	mobile banking app to make transactions.					
CU4	I will continue to use the mobile banking app to manage my accounts.	1	2	3	4	5

Artificial intelligence features

SECTION F: PERCEIVED ARTIFICIAL INTELLIGENCE

Perceived Artificial Intelligence		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
PI1	Mobile banking apps can help me to complete banking transactions quickly.	1	2	3	4	5
PI2	Mobile banking app can understand my instructions.	1	2	3	4	5
PI3	Mobile banking apps can communicate with me in a way that I understand.	1	2	3	4	5
PI4	Mobile banking apps	1	2	3	4	5

	are able to set and pursue tasks automatically in anticipation of my future needs.					
--	--	--	--	--	--	--

SECTION G: PERCEPTIONS OF SERVICE DELIVERY

Perceptions Of Service Delivery		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
PSD1	I have found that mobile banking apps offer more consistent services than human beings.	1	2	3	4	5
PSD2	I have found that mobile banking apps offer accurate services than human beings.	1	2	3	4	5
PSD3	I have found that mobile banking apps offer efficient services than human beings.	1	2	3	4	5
PSD4	I believe that mobile banking apps deliver a satisfactorily experience in a	1	2	3	4	5

	banking environment.					
--	----------------------	--	--	--	--	--

SECTION H: PERCEIVED ANTHROPOMORPHISM

Perceived Anthropomorphism		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
PA1	Using a mobile banking app to complete a task feels similar to interacting with a real person.	1	2	3	4	5
PA2	The mobile banking app feels friendly.	1	2	3	4	5
PA3	I feel that the mobile banking app respects me.	1	2	3	4	5
PA4	The mobile banking app makes me feel interesting.	1	2	3	4	5

Personal Factors

SECTION I: PERCEIVED SECURITY

Perceived Security		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
PS1	I receive confirmation SMS every time I use a mobile banking service.	1	2	3	4	5

PS2	I receive confirmation evidence every time I complete a transaction.	1	2	3	4	5
PS3	Every time I use my mobile banking app, I am asked to provide a transaction password.	1	2	3	4	5
PS4	A one-time password from SMS is needed for using the mobile banking app.	1	2	3	4	5

Experiential and functional factors

SECTION J: TECHNOLOGY TASK FIT

Technology Task Fit		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
TTF1	The functions provided by the mobile banking app simplify the banking tasks that I need to complete.	1	2	3	4	5

TTF2	The functions provided by the mobile banking app are consistent with the banking tasks that I need to complete.	1	2	3	4	5
TTF3	The various banking service functions provided by the mobile banking app are useful.	1	2	3	4	5
TTF4	The services provided by the mobile banking app meet my banking needs.	1	2	3	4	5
TTF5	The banking functions provided by the mobile banking app are comprehensive.					

SECTION K: GAMIFICATION

Gamification		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
GAM1	I would feel pleasure in the use of a banking app with features of games.	1	2	3	4	5

GAM2	I think that a banking app with content and animated elements would be secure.	1	2	3	4	5
GAM3	Learning how to use mobile banking during a game on a mobile app would be nice.	1	2	3	4	5
GAM4	A mobile banking app with features of games would encourage interaction.	1	2	3	4	5

SECTION L: MOBILE APP INTERACTIVE QUALITY

Mobile App Interactive Quality		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
IQ1	Using the mobile banking app makes me feel that I am a dispensable consumer of the bank.	1	2	3	4	5
IQ2	I feel that I highly rely on the mobile banking app.	1	2	3	4	5
IQ3	Using the mobile banking app	1	2	3	4	5

	makes me feel that I am a valuable consumer of the bank.					
IQ4	The mobile banking app is well structured.					

SECTION M: MOBILE APP SERVICE QUALITY

Mobile App Service Quality		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
SQ1	The mobile banking app has a modern-looking interface.	1	2	3	4	5
SQ2	The mobile banking app provides the right solution to my request.	1	2	3	4	5
SQ3	The mobile banking app gives me individual attention.	1	2	3	4	5
SQ4	The mobile banking app has an excellent interface to communicate my needs.	1	2	3	4	5

SQ5	The mobile banking app has appealing banking content.					
-----	---	--	--	--	--	--

Expectation confirmation

SECTION N: EXPECTATION CONFIRMATION

Expectation Confirmation		Strongly Disagree	Disagree	Neither disagree nor agree	Agree	Strongly Agree
EC1	The mobile banking app meets my expectation.	1	2	3	4	5
EC2	My experience using the mobile app was better than I had expected.	1	2	3	4	5
EC3	Overall, using the mobile app met my initial expectation.	1	2	3	4	5
EC4	The mobile banking app meets my needs.	1	2	3	4	5
EC5	The mobile banking app confirms my prior belief and understanding of mobile banking.					

Appendix C: Questionnaire Codebook

Gender

Female	1
Male	2
Non-binary	3
Prefer not to say	4

Do you have a banking account?

Yes	1
No	2

Do you have a mobile banking app?

Yes	1
No	2

Generation

Gen Z (18-24)	1
Millennial (25-39)	2

Please indicate the province in which you reside.

Gauteng	1
Free State	2
KwaZulu Natal	3
Limpopo	4
Eastern Cape	5
Northern Cape	6
North West	7
Mpumalanga	8
Western Cape	9

Please indicate your highest academic qualification.

High School	1
Diploma	2
Bachelors Degree	3
Postgraduate Degree	4
PhD	5
Other	6

Monthly Income

Less than R10k	1
R10k -R25k	2
R26k -R45k	4
R46 +	4

How many mobile banking apps do you have?

1	1
2	2
3 +	3

Which bank holds your primary banking account?

ABSA	1
African Bank	2
Bank Zero	3
Capitec	4
Discovery Bank	5
FNB	6
Investec	7
Nedbank	8
Standard Bank	9
Tyme Bank	10
Other	11

How many banking accounts do you have

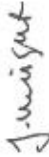
1	1
2	2
3 +	3

Which of the following mobile banking services do you use?

Check account balance	1
Transfer money between accounts	2
View Statements	3
Pay Bills	4
Learn about banking and financial products and services	5

Likert Scale

Strongly Disagree	1
Disagree	2
Neither disagree nor agree	3
Agree	4
Strongly agree	5

CERTIFICATE OF COMPETENCE IN RESEARCH ETHICS	
Name: Neo Mashishi	
Student/Staff No: 692452	
Date of Certification: 14 September 2022 - 13 September 2025 (This certificate is valid for a period of three years)	
TRAINED BY:	
PROFESSOR JASPER KNIGHT (RESEARCH ETHICS)	
SIGNATURE	
 UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG	
ISSUED BY:	
DR ROBIN DRENNAN (DIRECTOR: RESEARCH OFFICE)	
SIGNATURE	
This certificate is confirmation of successful completion of a training course in Research Ethics for Non-Medical human research, based upon achieving a minimum level of competence in different assessment tasks.	

Appendix E: Ethical Clearance



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)

R14/49 Mashishi

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: H22/10/17

PROJECT TITLE

Mobile banking apps curation: Assessing the factors that influence mobile banking's continuous use amongst Millennials and Generation Z

INVESTIGATOR(S)

Ms N Mashishi

SCHOOL/DEPARTMENT

School of Business Sciences/

DATE CONSIDERED

21 October 2022

DECISION OF THE COMMITTEE

Approved
Risk Level: Minimal

EXPIRY DATE

30 November 2025

DATE 01 December 2022

CHAIRPERSON

(Professor J Watermeyer)

cc: Supervisor : Dr M Zulu

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. **Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)**

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. **I agree to completion of a regular progress report. For Minimal and Low studies, this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and 31 December.**

Signature

02 / 12 / 2022
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Appendix F: Permission letter



Investec Bank Limited

100 Grayston Drive Sandown Sandton 2196
PO Box 785700 Sandton 2146 South Africa
T +27 (0) 11 286 7000 F +27 (0) 11 286 7966
www.investec.com

02 November 2022

To whom it may concern,

RE: Gatekeepers permission letter to conduct study

Ms. Neo Mashishi, student number 692452, is a registered Master of Commerce student at the University of the Witwatersrand

Investec acknowledges and understands that her research project will contribute towards her dissertation project titled: *Mobile banking apps curation: Assessing the factors that influence mobile banking's continuous use amongst Millennials and Generation Z.*

Investec is aware that the study will involve the collection of data by means of distributing the survey to Investec Staff, which she deems necessary to achieve the objectives of the research.

Investec hereby grants Neo permission to conduct the survey with Investec Staff, provided that the Investec respondents remain anonymous at all times.

If you require further information please contact Micosha Palanee on:

- Email: Micosha.Palanee@investec.co.za
- Telephone: +27 11 291 0276

Kind regards

DocuSigned by:
A handwritten signature in black ink that reads "Yeoshaan Ramdutt".

Name: Yeoshaan Ramdutt

Designation: Head of Legal: Operations

Date: 11/2/2022

Appendix G: Tests of Normality

Table 38: Tests of Normality

Tests of Normality						
	Kolmogorov-Smirnova			Shapiro-Wilk		
Constructs	Statistic	df	Sig.	Statistic	df	Sig.
PI1	0.521	505	0	0.195	505	<.001
PI2	0.515	505	0	0.312	505	<.001
PI3	0.507	505	0	0.316	505	<.001
PI4	0.505	505	0	0.385	505	<.001
PI5:	0.502	505	0	0.399	505	<.001
PSD1	0.488	505	0	0.418	505	<.001
PSD2	0.498	505	0	0.405	505	<.001
PSD3	0.507	505	0	0.37	505	<.001
PSD	0.501	505	0	0.388	505	<.001
PA1	0.262	505	<.001	0.835	505	<.001
PA2	0.233	505	<.001	0.814	505	<.001
PA3	0.229	505	<.001	0.816	505	<.001
PA4	0.241	505	<.001	0.826	505	<.001
PA5	0.229	505	<.001	0.825	505	<.001
SRT1	0.371	505	<.001	0.69	505	<.001
SRT2	0.358	505	<.001	0.7	505	<.001
SRT3	0.359	505	<.001	0.669	505	<.001
SRT4	0.361	505	<.001	0.696	505	<.001
SRT5	0.358	505	<.001	0.669	505	<.001
PS1	0.513	505	0	0.343	505	<.001
PS2	0.526	505	0	0.318	505	<.001
PS3	0.515	505	0	0.311	505	<.001
PS4	0.519	505	0	0.305	505	<.001
PE1	0.537	505	0	0.252	505	<.001
PE2	0.538	505	0	0.229	505	<.001
PE3	0.538	505	0	0.223	505	<.001
PE4	0.531	505	0	0.265	505	<.001
TTF1	0.531	505	0	0.305	505	<.001
TTF2	0.528	505	0	0.304	505	<.001
TTF3	0.531	505	0	0.32	505	<.001
TTF4	0.527	505	0	0.321	505	<.001
TTF5	0.514	505	0	0.348	505	<.001
GAM1	0.283	505	<.001	0.836	505	<.001
GAM2	0.208	505	<.001	0.862	505	<.001
GAM3	0.233	505	<.001	0.853	505	<.001
GAM4	0.238	505	<.001	0.853	505	<.001
IQ1	0.514	505	0	0.312	505	<.001
IQ2	0.513	505	0	0.352	505	<.001
IQ3	0.525	505	0	0.318	505	<.001

IQ4	0.528	505	0	0.305	505	<.001
SQ1	0.519	505	0	0.29	505	<.001
SQ2	0.522	505	0	0.323	505	<.001
SQ3	0.517	505	0	0.332	505	<.001
SQ4	0.514	505	0	0.32	505	<.001
SQ5	0.515	505	0	0.337	505	<.001
EC1	0.521	505	0	0.306	505	<.001
EC2	0.522	505	0	0.33	505	<.001
EC3	0.523	505	0	0.287	505	<.001
EC4	0.524	505	0	0.292	505	<.001
EC5	0.518	505	0	0.344	505	<.001
TR1	0.514	505	0	0.324	505	<.001
TR2	0.512	505	0	0.336	505	<.001
TR3	0.515	505	0	0.318	505	<.001
TR4	0.514	505	0	0.338	505	<.001
MBA1	0.508	505	0	0.393	505	<.001
MBA2	0.515	505	0	0.398	505	<.001
MBA3	0.505	505	0	0.432	505	<.001
MBA4	0.514	505	0	0.402	505	<.001
STA1	0.523	505	0	0.307	505	<.001
STA2	0.522	505	0	0.324	505	<.001
STA3	0.522	505	0	0.327	505	<.001
STA4	0.523	505	0	0.318	505	<.001
CU1	0.537	505	0	0.24	505	<.001
CU2	0.537	505	0	0.24	505	<.001
CU	0.537	505	0	0.24	505	<.001
CU4	0.532	505	0	0.249	505	<.001