

The influence of digital transformation on low-income, rural customers in the large South African banks

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**A research report submitted to the Faculty of Commerce, Law and
Management, University of the Witwatersrand, in partial fulfilment of the
requirements for the degree of Master of Management in the field of Digital
Business**

Johannesburg, 2022

ABSTRACT

Banks are faced with a need to adapt and integrate digital technologies to augment their competitiveness, increase market infiltration, improve client experience, create efficiencies and promote financial inclusion.

With the rapid increase in digital transformation in the banking industry, several challenges need to be addressed for the rural and low-income customer segments. The acceptance, adoption and utilization is very limited in rural areas due to limited or lack of infrastructure, access to technology and knowledge/skills.

The purpose of this qualitative study is to explore the influence of digital transformation on low-income, rural customers in the large South African Banks. 13 Banking executives comprising of senior management from the large South African Banks were interviewed using in-depth semi-structured interviews. The data was analyzed using qualitative thematic analysis technique, data reduction, presentation, and conclusion-drawing techniques, a range of responses acquired during interviews were grouped into six key themes.

According to the study findings, the elements of the digital divide have been identified as the most important aspect impeding the adoption, acceptability, usage of digital product innovations in South Africa, further findings report that there is a need for comprehensive improvements at the branch level to win clients' trust and confidence in digital banking, which is initiated at branch banker level creating awareness of digital product innovations, as well as educating and training customers on these digital product innovations. In addition, the findings suggest that clients who adopt and utilise digital product innovations are deriving incredible benefits. The study offers valuable recommendations, limitations and suggestions for future research topics.

KEYWORDS

Digital transformation, Digital product innovation, Banking, Low-income customers, Rural customers, Digital Divide

DECLARATION

I, Chandika Aruthkumar, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the field of Digital Business at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

Name: Chandika Aruthkumar

Signature: *CAruthkumar*

Signed at Johannesburg, South Africa on the 29th Day of March 2022.

DEDICATION

Every journey necessitates self-effort and discipline as well as guidance and encouragement from those closest to us. I dedicate my endeavour to my adoring parents and husband. Whose love, support, and prayers empower me to achieve success.

Thank you, God, for providing me with the opportunity to gain new skills and broaden my knowledge. Thank you for your guidance through this intense yet rewarding journey.

ACKNOWLEDGEMENTS

I would like to take this time to offer my sincere gratitude and thank you to my supervisor, professors, lecturers, and family, without whom this incredible journey would not have been possible. Without the help and direction of numerous people, pursuing this master's degree would not have been attainable. I am grateful to everyone who helped me stay on track, tenacious, and self-assured during the duration of my studies.

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LIST OF ACRONYMS

4IR Fourth Industrial Revolution

AEPS Aadhaar enabled payment system

AI Artificial Intelligence

APIs Application programming interfaces

ATM Automated Teller Machine

COEFS Centre of Excellence in Financial Services

FinTech Financial Technology

GB Gigabyte

ICT Information Communication Technology

IOT Internet of things

IRT Innovation Resistance Theory

LSM Living Standards Measure

OECD Organisation for Economic Co-operation and Development

P2P Peer-to-Peer

P.M. Per Month

PEOU Perceived Ease of Use

PIN Personal Identification Number

PU Perceived Usefulness

RCA Resistance Communication Adoption

ROI Return on Investment

SASSA South African Social Security Agency

TAM Technology Adoptance Model

TRAM Technology Readiness and Acceptance Model

TR Technology Readiness

TRI Technology Readiness Index

USSD Unstructured Supplementary Service Data

UTAUT Unified Theory of Acceptance and Use of Technology

CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

This qualitative study explores the influence of digital transformation on low-income, rural customers in the large South African banks, by identifying what factors permit or hinder customers from adopting, accepting, and utilising digital product innovations.

1.2 Context of the study

Relative to other developing countries, the banking industry in South Africa is well-developed and regulated (GPFI, 2014). The industry is under great pressure, to provide a seamless banking experience to their customers. The advent threat of new entrants and current competitors is also cause for alarm, with the likes of competitor banks, digital banks, and other digital disruptors such as Financial Technology companies (FinTech's) (Omarini, 2017).

Traditional banks in South Africa have had to rethink their business strategies in recent years, adopting and deploying digitally enabled products and services to meet a more customer-centric approach and remain relevant to their customers. The South African banking industry is becoming more and more dependent on advanced technology to develop new markets or enter current markets as well as enhance customer experience (BASA, 2019).

By adopting and implementing digital technologies, digitalization permits banks to amplify their effectiveness and enhance client experience whilst decreasing operational costs, which aids in process enhancements, improvements and provides big data allowing improved decision making. The shifting behaviours of customers are challenging banks to provide new ways of using financial services and products. Digitalization allows banks to promote their brand, products, and services (Meena & Parimalarani, 2020).

According to Berndt & Saunders (2010), technology is accelerating at an advanced rate, swiftly altering the day-to-day lifestyle of people. Similarly, digital transformations have had a radical impact on the way companies design their business models, processes, products, and services and in the way they engage with customers (Louw & Nieuwenhuizen, 2020). Thanks to substantial advancements in automation and artificial intelligence technology, customers now have the ability to conduct transactions and services on a global scale via a smart phone (Berndt & Saunders, 2010).

As a result of complicated economic shifts and rapid technological advancements, the banking industry is undergoing a rapid digital transformation. Owing to the digital transformation journey, banks have had to introduced digital product innovations such as the automated teller machine (ATM) banking service, mobile banking, telephone banking, and online banking, which are all ground-breaking technologies for offering banking facilities to current banking customers, as well as important technology-enabled products and services for delivering banking products and services to low-income and rural segment customers (Neog, 2019).

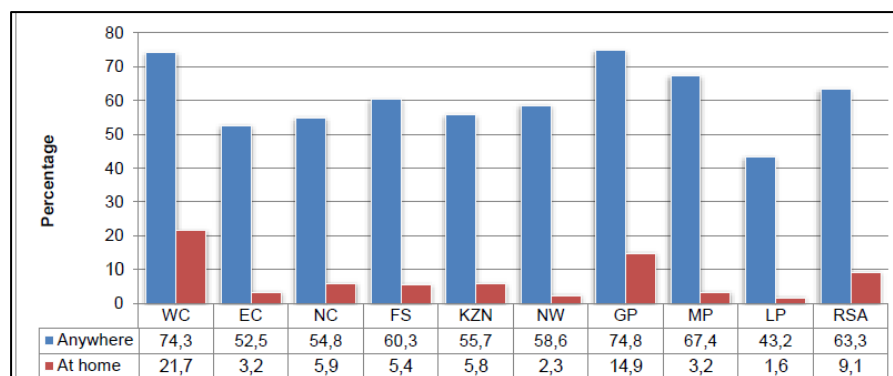
According to Nkoyi et al. (2019), the benefits of these digital product innovations introduced for customers include augmented control, increased speed in obtaining banking facilities, better-quality access to products and services, and monetary investments using digital products and services (Chakrabarty, 2011).

Innovative digital services and products progress the banks character among clients, as clients believe organisations should be adopting new technologies to deliver viable benefits. Despite the implementation of digital product innovations, these innovative technological developments have not yielded the results envisioned by banks due to clients not adopting and utilising these digital product innovations, at the rate anticipated by the banks (Kaur et al., 2020).

This is largely due to a lack of awareness, knowledge, and skills among customers (Shaikh et al., 2020). So, how are banks ensuring that their digitally

enabled products and services are adopted and used by rural and low-income customers in South Africa, given the challenges of high unemployment, poverty, inequality, language literacy, financial literacy, and digital literacy (StatsSA, 2019)?

South Africa's provinces are depicted in Graph 1 below (StatsSA, 2019), with households in cities having the most internet connectivity compared to rural areas. Internet access is available to 15.4 % of homes in metropolitan areas, 7.2 % of urban households, and 1.2 % of rural households.



Graph 1: Households with access to the internet (Source: StatsSA, General Household Survey, 2019)

As illustrated in Table1 below, several difficulties have been highlighted as preventing or discouraging South Africans from embracing digital products. The most major impediments to internet adoption in South Africa, according to Nyambura et al. (2017), include low income and affordability, a lack of information, skills, and literacy, lack of confidence, and infrastructure-related barriers.

Barriers	Identified contributing factors
Low income and affordability	Low purchasing power (driven by poverty, high unemployment and lack of upward mobility) High interconnection charges passed on to consumers by operators resulting in high prepaid mobile prices
Lack of appropriate or sufficient incentives	Lack of awareness of the Internet and its benefits Shortage of relevant local content and services Lack of cultural or social acceptance
Skills and literacy	Low levels of digital literacy Low levels of language literacy
Infrastructure	Inadequate coverage or network access Deficient adjacent infrastructure (such as grid electricity and paved roads)

Table 1: Barriers to Internet adoption (Nyambura, et al., 2017)

According to a study performed by StatsSA (2015), 35.5 % of South Africans lacked knowledge/skills and/or confidence in using the internet, while 33 % showed no desire to do so, with the cost of equipment being the third most given reason (see Figure 1 below).

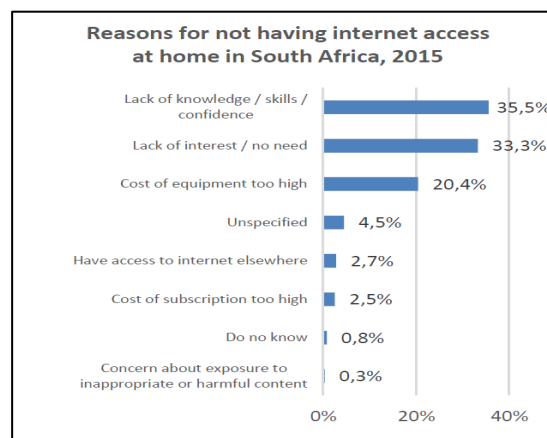


Figure 1: Reasons for non-internet use in South Africa (StatsSA, General Household Survey, 2015)

1.3 Research Problem

Over the last few decades, as part of their digital transformation journey, banks have made significant investments in technology to reduce costs and improve customer service. To deliver high-quality services to clients while increasing profitability and minimizing operating costs, banks are deploying digital product innovations such as ATMs, Internet banking, mobile banking, and digital banking

kiosks. The bank anticipates lower costs as a result of migrating a large number of customers to modern banking methods. Banks, on the other hand, have yet to realize the promised reduction in operating expenses because they are still battling to migrate rural and low-income segment customers to digital banking channels.

This study will provide an insight on how digital transformation influences banks retail customers in the rural and low-income segment, who face numerous barriers to technology access. Are these customers being included or excluded from the digital journey?

1.4 Research Objectives

1.4.1 Primary research objective:

Explore the influence of digital transformation on low-income, rural customers in the large South African banks.

1.4.2 Secondary research objectives :

1. To explore whether digital product innovations introduced by banks as part of their digital transformation journey is achieving the desired results
2. To explore whether the introduction of digital product innovations drives any unintended results
3. To explore the positive influence digital product innovations may have on the rural/low-income segment's customers

1.5 Significance of the study

The empirical significance of this study is to explore the influence of digital transformation on low-income, rural customers in the large South African banks. The researcher will look into whether these digital product innovations implemented, which are a subset of the broader concept of the digital transformation of the banks journey is achieving the desired outcomes that banks hoped. The study will also look into whether digital product innovations have any

unintended consequences for customers in rural and low-income areas, as well as what influence and benefit these innovations have on these customers.

Individual inequalities have plagued civilizations throughout history, and rural and low-income people have been mostly excluded from development goals and major decision-making processes that affect them. The rural population in South Africa is no exception, and they do not have the same privileges as their urban counterparts. Digital banking, on the other hand, has the ability to bridge the urban-rural divide by giving people in rural areas access to financial services, improving their lives and assisting their economic progress (Mpofu & Warikandwa, 2013).

Despite the fact that numerous empirical studies have shown high levels of mobile phone adoption in South Africa, few studies examine or explore the extent of digital banking adoption and usage among rural and low-income segment customers, or the influence digital banking has on this market segment in South Africa.

This is supported by a study by Assensoh-Kodua et al. (2016), which found that in South Africa, research on digital banking has focused on academic models and practitioner involvement rather than major importance. They discovered that research has not included the knowledge and assessment of digital banking demands, and as a result, the influence of digital product innovations introduced by banks has been overlooked.

Although mobile phone coverage and use of digital banking via mobile app has increased internationally and in South Africa, it is still uncertain what influence the introduction of digital product innovations by large South African banks has on rural and low-income segment customers. Studies conducted by (Shambare, 2013; Ismail & Masinge, 2011; Maduku & Mpinganjira, 2011; Wentzel et al., 2013), in South Africa were only urban based.

As a result, there is a need in South Africa to better understand the influence of digital product innovations introduced by banks as part of their digital

transformation journey, on rural and low-income segment customers, as well as to explore the factors that are assumed to facilitate or obstruct acceptance, adoption and usage. This study explores and validates the elements that are expected to influence the adoption of digital product innovations among rural and low-income segment customers using concepts from a conceptual framework in general and the Technology Acceptance Model (TAM).

This study could help the banking industry by:

- Identifying whether digital product innovations introduced as part of the banks digital transformation journey, are delivering the promised results.
- Determining whether these digital product innovations introduced has had any unforeseen repercussions, benefits, or influence on rural and low-income segment customers.
- May provide insight to banks to introduce digital product innovations that are tailored to this customer segment in order to enhance digital acceptance, adoption and usage.

1.6 Delimitations of the study

Due to the covid-19 pandemic and the high-risk factors of doing face-to-face interviews, the researcher did not interview bank customers.

- a) The research was limited to the influence of digital transformation on low-income, rural segment customers of large South African banks.
- b) The findings of the study were limited to the context of South Africa.
- c) The research findings are from the large South African banks' perspective, on the influence of digital transformation on customers and does not consider the customers perspective.
- d) The research was conducted via Microsoft Teams.

1.7 Assumptions

The following assumptions have been made in this research study:

- The large South African banks are digitalizing their banking services, products, and customer engagement.
- The digital divide has an influence on customer acceptance, adoption, and use of digital product innovations, as well as the features of the technology acceptance model (TAM), such as perceived ease of use and perceived usefulness.
- The nature and extent of adoption of digital product innovations by rural and low-income segment customers has positive and negative results for customer and banks.
- The participants will represent a diverse range of perspectives and experiences, resulting in robust outcomes and discussion for this study.

1.8 Chapter Outline

This research study has six (6) chapters. The introductory chapter is followed by the theoretical and conceptual frameworks in chapter two (2), the researcher examines relevant and related literature on digital transformation in banks and its influence on low-income and rural customers. In chapter three (3), the experimental study design approach used in data collection is explored. Chapter four (4) entails presenting the study findings. The findings are described and explained in the context of the literature in Chapter five (5), which is similar to a literature review and incorporates and emphasizes this study findings. In Chapter 6, the findings regarding the propositions are integrated into the original research objectives established in Chapter 1 and each objective is addressed in turn. It includes future research recommendations as well as industry considerations.

The reference section contains a list of all cited papers, journals, books, articles, and other publications that were used in the research.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This section observes several studies conducted in the digital transformation field relating to the banking sector as well as the influence it has on the rural and low-income segment customers, with an emphasis on elements that enhance the objectives of this proposed research. It starts with a brief overview of the topic and definitions of essential terms, then looks into digital transformation frameworks used by a variety of organizations to achieve their goals and strategies. It also looks at theories and frameworks for client adoption/acceptance of technology as well as the elements of the digital divide, which is an inhibitor to the adoption and acceptance of digital product innovations. The chapter concludes providing detail on the 3 propositions as well as the conceptual framework.

2.2 Definition of terms

It is significant to comprehend what digital transformation, digitisation and digitalisation is prior to getting to why banks are undertaking this transformation. According to Bloomberg (2018), they are frequently used interchangeably, but the distinction is critical to comprehending Industry 4.0 and digital transformation.

➤ What is digital transformation?

Chapco-Wade (2018), defines digital transformation as an endeavor to empower existing business models by incorporating sophisticated technologies. In essence, it enables digital technology to be incorporated into traditional business processes, resulting in a shift in how businesses operate and deliver their products or services (Bhattarai, 2020).

Furthermore, customers are influenced by digital transformation, which has an impact on their lives as well as the economy, due to the quick and fundamental evolution of digital technology (Ebert & Duarte, 2016).

Source	Definition
(Negreiro & Madiega, 2019) https://epthinktank.eu/2019/03/08/eu-policies-delivering-for-citizens-digital-transformation-policy-podcast/	“Digital transformation is the result of a combination of sophisticated technology and the integration of physical and digital systems, as well as the adoption of advanced business models and new processes, as well as the development of smart products and services”.
(OECD, 2018, p.8)	“Digital transformation refers to the economic and societal effects of digitization and digitalization. Digitization is the conversion of analogue data and processes into a machine- readable format. Digitalization is the use of digital technologies and data as well as their interconnection which results in new or changes to existing activities”.
(Shwertner, 2017, p.389)	Digital Transformation is the application of technology to build new business models, processes, software and systems that result in more profitable revenue, greater competitive advantage, and higher efficiency.
(Deloitte, 2018) https://www2.deloitte.com/ie/en/pages/technology/articles/digital-enablement.html	“Digital transformation is the application of technology to dramatically increase an organization's performance or reach. Digital technology offers enhanced procedures, engaged personnel, and new business models in a digitally changed firm”.
(Bloomberg, 2018, p.6)	“Digital transformation requires the organization to deal better with change overall, essentially making change a core competency as the enterprise becomes customer-driven end-to- end. Such agility will facilitate ongoing digitalization initiatives but should not be confused with them”.
(Ismail, Khater, & Zaki, 2018, p.5)	“The economic and societal implications of digitization and digitalization are referred to as digital transformation. The translation of analogue data and processes into a machine-readable format is known as digitization. Digitalization is defined as “the application of

	digital technology and data, as well as their interconnection, to produce new or altered activities”.
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Table 2: Definitions of the term digital transformation

- Digitisation: Armstrong & Lee (2021), in their study positions digitalization as the process of transforming analogue information and/or physical objects into digital form. According to Bloomberg (2018), digitization is the process of transforming analog information into zeros and ones so that computers can store, analyse, and disseminate it. It is the information, not the processes, that is getting digitized, and this is where digitalization comes in.
- Digitalisation: Gartner (2020), outlines digitalization as, the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business. Bloomberg (2018) further goes on to say, The Brookings report focuses on how people are affected by digitization. According to the research, digitalization is altering the world of work. Acquiring digital skills has now become a must for personal, industry, and regional success. Reis et al. (2020), defines digitalization as the phenomena of converting analogue data into digital language (i.e., digitization), which can improve customer-company connections and provide value to the economy and society.
- Digital product innovation: Refers to the application of digital technology to existing business problems to innovate new products or services (Mendix, 2022). Digital product innovation is a sub set of digital transformation and is 1 of the 12 factors of digital maturity of the unified model (Armstrong & Lee, Digital Business, 2021).
- Rural is defined as representing all locations outside of the following:
 - ❖ *Metropolitan areas*
 - ❖ *Large towns*
 - ❖ *Towns*

Specifically, based on data from Stats SA 2016 census we define these as follows:

Metros

City of Johannesburg Metro	eThekweni Metro	Emfuleni Local Municipality
City of Cape Town Metro	Ekurhuleni Metro	Mangaung Metro
City of Tshwane Metro	Nelson Mandela Bay Metro	Buffalo City Metro

Table 3: List of Metros

Larger Towns

Stellenbosch	Pietermaritzburg	Hermanus
Polokwane	Paarl	Knysna
Rustenburg	Kimberley	George

Table 4: List of Larger Towns

Towns

Nelspruit	Klerksdorp	Louis Trichardt
Krugersdorp	eMalahleni	Randfontein
Welkom	Tzaneen	Richards Bay
Secunda	Mahikeng	Potchefstroom
Malamulele	Mokopane	Mthatha
Newcastle	Middelburg	Ladysmith
KwaDukuza	Sasolburg	Phalaborwa
Port Shepstone	Kroonstad	Estcourt
Carletonville	Ermelo	Vryheid
Heidelberg	Parys	Jeffreys Bay
Meyerton	Malmesbury	Hoedspruit
Bethlehem	Ulundi	Uppington
Grahamstown	Brits	eMpumalanga
Plettenberg Bay	Thohoyandou	Siyabuswa
Port Alfred	Apel	Mandeni

Table 5: List of Towns

- Urban : Is defined as “67% of South Africa's total population lives in urban areas and cities. Urbanization defines the share of urban population from the total population of a country” (StatsSA, 2019, <https://www.statista.com/statistics/455931/urbanization-in-south-africa/>).

Urban areas are defined as those represented by the metros, larger town and towns as defined above.

- Low Income: In this report low income customers are defined as those falling in the LSM 1 to 4 segments, as defined below.
- LSM (Living Standards Measure): “The tool divides the population into LSM groups, with ten being the highest level for the wealthiest people and one being the lowest level for individuals with no quantifiable wealth. The LSM tool divides people into groups based on their standard of living wealth rather than their income, utilizing measures including degree of urbanization, ownership

of cars and large appliances or assets, and access to basic utilities like water and electricity” according to (Ntloedibe & Ngqinani, 2020, p. 2).

LSM 1 – 4 – least access to wealth

- Primary to some high school completed.
- Mostly Urban or Rural (i.e., not suburban).
- Household is traditional hut to matchbox house or shack.
- Salary ranges from R1,363 to R3,138 per month (approximately US \$85 - \$200).
- Media: Commercial radio is a major channel of communication with African Languages Services (ALS), TV with minimal channels, and minimal outdoor life.

General: Minimal access to services, minimal ownership of durables except radio sets and stoves, low income transactional “Mzansi” bank account, minimal participation in economic activities, some electricity, hot plates, water on plot or communal, non-flush toilet, TV sets. Activities: Attend gatherings, go to night clubs.

LSM 5 – 7

- High school and/or some higher education.
- Mostly Urban or Rural (i.e., not suburban).
- Salary ranges from R4,165 to R11,263 per month (approximately US \$260 - \$700)
- Media: Commercial radio mainly ALS to wide range of commercial and community radio, TV with few channels, community TV, all print, daily or weekly newspapers, access to internet, magazines, cinemas, low income transactional “Mzansi” bank account, and outdoor life.

General: Has electricity, water, flush toilet, TV set, hi-fi or radio set, stove, fridge, ownership of number of durables plus cellphone, can purchase take-away food, lottery tickets. Level 7 full access to services, increased ownership of durables plus motor vehicle, and participation in all economic activities.

LSM 8 – 10 – most access to wealth

- High school and higher schooling.
- Mostly Urban and Suburban.
- Salary ranges from R13,210 to R32,521 per month (approximately US \$825 - \$2,000).
- Media: Wide range of commercial and community radio, wide range of TV channels, daily or weekly newspapers, magazines, accessed internet, cinema and outdoor life.
- General: Full access to services and bank accounts, full ownership of durables such as cars, furniture, and appliances; participation in any leisure activities of interest and access to all economic activities.

This study will focus on the LSM1- 4 group bordering on the LSM 5 -7 group.

- The Digital Divide : according to Soomro, Kale, Curtis, Akcaoglu, & Bernstein (2020), the digital is defined as the difference between persons who have appropriate access to ICT and those who have “zero” or poor access to ICT. The Organization for Economic Cooperation and Development (2006) defines "digital divide" as "the gap between individuals, households, businesses, and geographic areas at various socioeconomic levels in terms of both their access to information and communication technologies (ICTs) and their use of the Internet for a variety of activities.

Components of the Digital Divide as per (Armstrong & Lee, Digital Business, 2021):

1. Access:

- *Availability refers to the quality and scope of the infrastructure that is available for Internet access and usage.*
- *Affordability refers to the price of access in relative to one's income and the level of competition in the online market.*

2. Usage:

- *Service relevance: availability and opportunity of native dialect and relevant content.*
- *Readiness: skills, cultural acceptance, and policy support are all determinants in being able to access the Internet.*

3. Benefits:

- *Economic*

- *Income*

- *Employment*

- *Social*

- *Networking*

- *Communities*

- *Cultural*

- *Education, knowledge, skills*

- *Institutional*

- *Engagement with Government*

- *Access to services for example healthcare*

➤ *Digital Literacy: The ability to use digital technology, communication tools or networks to locate, evaluate, use, and create information. The ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers. A person's ability to perform tasks effectively in a digital environment, as defined by (Walton, 2016). Charlotte (2021), defines digital literacy as the ability to use information and communication technologies to find, evaluate, create, and communicate*

information, requiring both cognitive and technical skills. Walton (2016), provides further definitions, digital literacy as the ability to find and use information (otherwise known as information literacy) but goes beyond this to encompass communication, collaboration and teamwork, social awareness in the digital environment, understanding of e-safety and creation of new information. Both digital and information literacy are underpinned by critical thinking and evaluation.

According to Walton (2016), A Digitally Literate Person:

- *Has the technical and cognitive abilities to locate, comprehend, evaluate, generate, and convey digital data in a variety of formats.*
 - *Can retrieve information, analyse outcomes, and assess the quality of that information using a variety of technologies in a suitable and effective manner.*
 - *Understands how technology, lifelong learning, personal privacy, and information stewardship are related.*
 - *Communicates and collaborates with classmates, co-workers, family, and, on occasion, the general public, using these abilities and appropriate technology.*
 - *Uses these skills to contribute to a thriving, knowledgeable, and engaged community by actively participating in civic society.*
- Information and Communication Technologies (ICT), according to (Modiba, 2020), refers to the methods used to offer data access to telecommunications systems. This is like IT, but it concentrates on communication technologies including the Internet, wireless networks, mobile phones, and other forms of media. Information technology is the abbreviation for information technology. ICT (information and communications technology) refers to the infrastructure and components that make modern computing possible (Pratt, n.d.).
- Digital Banking: According to Navarro (2019), a digital bank is one that uses internet protocol technologies to operate. The bank operates on digitized platforms and is digitally equipped. Consequently, the bank functions through a digital platform that provides the foundation for all end points: mobile,

telephone, Internet and branch, which means that all bank capabilities are digitally structured and as a result of this, all its products and services are delivered through Internet functionalities.

- Financial inclusion: Financial inclusion refers to the process of promoting affordable, timely and adequate access to a wide range of regulated financial products and services and broadening their use by all segments of society through the implementation of tailored existing and innovative approaches, including financial awareness and education with a view to promoting financial well-being as well as economic and social inclusion (Atkinson & Messy, 2013).

2.3 Background

In recent years, the banking sector has experienced significant changes and enhancements in order to cut costs and improve customer service (Kaur et al., 2020). The banking industry has benefited from digital transformation by increasing the number of touch points available to clients through digitally enabled products and services (Ditshego, 2018).

Historically physical channels such as brick and mortar branches were the only connection between banks and customers (Neog, 2019). Digital channels have extended points of contact, allowing clients to access their banking products and services at their convenience (Modiba & Kekwaletswe, 2020).

ATMs, credit cards, debit cards, online payment services, online investment products, electronic fund transfers, telephone banking, mobile banking, and mobile applications are just a few of the digitally enabled banking services and products that have been added, this not being an exhaustive list (Kaur et al., 2020).

According to Nayak (2018), banks are providing enhanced customer experiences and convenience to customers via digital channels. Digitalization lessens human error and builds customer loyalty. Singh & Malik (2019), in their study, state that

banks are investing a lot of capital and resources in their digital transformation journey to stay ahead of their competitors.

Digitalization affords the banking industry to attract new customers, as well as assists in improving services (Modiba, 2020). Customers have the ability to conduct banking activities by utilising a mobile device instead of going to a bricks and mortar branch to apply for or acquire banking products such as credit (Zheng, 2010).

Maumbe (2006), asserts that South Africa has an extremely robust financial industry, supported by a sophisticated, outstanding banking system and sound financial regulation. The (S.A.NationalTreasury, 2011), reports on “a safer financial sector to serve South Africa better”, and that the financial services industry has an impact on the life of each South African. Economic growth, job creation, infrastructure development, and long-term development are all aided by it. As a result, it is critical to have a well-regulated and stable sector.

These features, according to the Centre of Excellence in Financial Services (COEFS, 2017), provide a robust foundation for digital and fintech advances. South Africa is a developing country where inequality and unemployment are on the rise (Venter, et al.).

Even though 80 percent of South Africans have a bank account, many transactions are still cash-based (Ehrlich & Elliott, 2019). While a small percentage of clients are wealthy and technologically savvy, the majority lack access to resources and have low levels of financial and digital literacy. As a result, many low-income and rural clients are unable to obtain digital financial services due to a lack of financial resources. This creates worries about whether digital product innovations will cater mainly to a small segment of wealthy and technologically savvy clientele, and whether digital transformation in the banking sector will increase or decrease national value creation.

According to Nayak (2018), adoption and utilisation of digital financial services is very limited in rural areas due to limited or lack of electricity infrastructure, roads

infrastructure, technology infrastructure, access to technology, knowledge skills (literacy and numeracy), trust issues, language barriers and cultural factors (Armstrong, 2020).

South Africa has high levels of income inequality, with a large majority of the population in the low-income segment, where jobs are rare and several earn a salary from the informal economy which is dominated by cash (Chetty, et al., 2017).

Figure 2 illustrates that, 81% of South African adults earn less than R6000 per month (p.m.), with 16% of adults in the middle-income earning up to R30 000 and only 3% being relatively affluent, earning above R30 000, according to (FinMarkTrust, 2016).

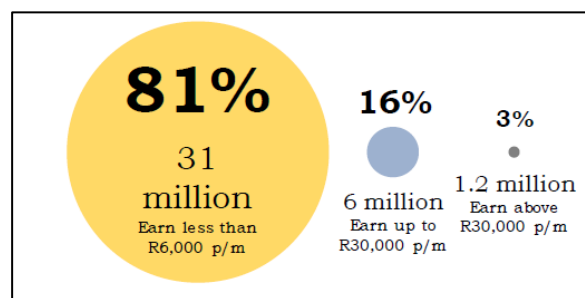


Figure 2: Income average of South Africans (FinMarkTrust, 2016)

Cash is still predominantly utilised among lower-income and rural segment customers, and this is driven by several social and cultural factors (Ehrlich & Elliott, 2019). In rural communities, cash is the prime means of exchange and is deemed to be more real, tangible, and accessible. Physical currency is alleged to offer the holder an augmented level of control as well as a means of integrating into the community, enabling someone to assist their inner circle with monetary assistance and ensuring it does not exclude anyone without access to modern ways of banking (Kumar, 2018).

The reality is that banks are developing digital services and products which caters mostly to the middle- and higher-income segments who are a financially and tech savvy market (Arora & Mishra, 2020). Outside of personal to personal mobile-

based payments, the more progressive digital financial solutions are not well matched for most mass market low-income and rural segment customers.

In several of The Southern African Development Community (SADC) countries, even though there is an increase in the acceptance of smartphones within the younger population, who are familiar with digital technologies, this does not essentially render to the capability to access and utilise digital financial services (Ramnath, 2018).

Several hurdles to the acceptance and adoption of digital financial services and products in this market persist, with lack of information, education, and awareness regarding digital product innovations as major impediments to adoption. As a result, financial education programs geared at improving people's knowledge of digital product innovations will be critical in encouraging more adoption (Fanta et al., 2016).

According to the OECD (2017), South Africa has a relatively truncated level of financial literacy, as illustrated in figure 3 below. South Africa has the lowest scores in the product choice and financial planning areas relative to the world average, these are both important for challenging and effectively picking increasingly sophisticated financial solutions. This is especially true for the lower-income and rural segments of the population, who performed poorly in all categories.

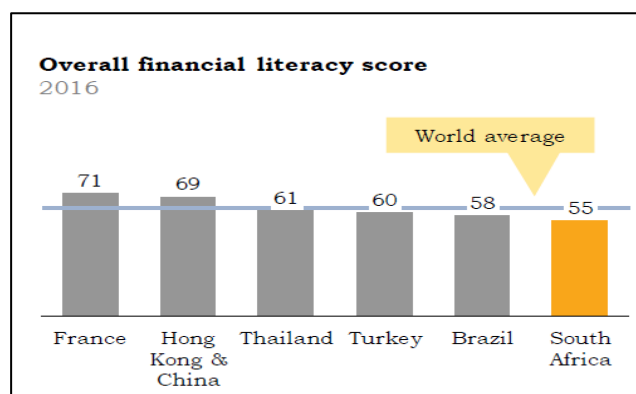


Figure 3: Overall Financial Literacy Score (OECD, 2017)

2.4 Understanding the Digital Transformation landscape in the Banking Industry

South Africa has a mature and well-regulated banking sector, offering an extensive variety of financial products and services, supported, and offered via a nation-wide system of diverse access points (National Treasury, an inclusive Financial Sector for all, 2020). According to Camarate & Maritz (2018), the South African banking industry is gradually transforming to a "marketplace without limits," shaped by new competitors who are challenging the status quo and offering exceptional products and services. Absa, FirstRand, Nedbank, and Standard Bank, the main big four banks, are pursuing extensive transformation efforts that include new methods of working, improving customer experience, digital transformation, and reducing enterprise-wide costs (Camarate & Maritz, 2018).

Supply chain amalgamation, digital solutions and low-cost operating models are now top priorities in business, with new digital competitors chasing several facets of these inclinations, allowing them to offer clients internal financial solutions. ABSA, Standard Bank, Nedbank, and FirstRand, the big four banks, are always looking for new methods to stay relevant (Camarate & Maritz, 2018).

Traditional banks, unlike new entrant competitors, have a considerable market share of retail banking customers (Camarate & Brinckmann, 2017). In order to derive viable solutions to improve customer experience, banks are prioritising critical functional trends like digital transformation and data mining (Camarate & Maritz, 2018). Traditional banks in South Africa are investing extensively in digital transformation as a result of the evolving digital disruption (Camarate & Brinckmann, 2017).

Kamra (2020), in his study postulates, rather than just switching from traditional banking to a digital modern bank, digital transformation begins with an understanding of client wants and behavior. As a result of this transformation

journey, the business has undergone significant changes, changing from a product-centric to a customer-centric perspective.

2.4.1 The wave of digitalization in banks

Omarini (2017), in her study positions that many industries are facing possible disruption in the way they operate due to digitalization, this has however, resulted in the development of new growth and innovation created by complex and dynamic eco-systems. Artificial intelligence, cloud computing, analytics and big data, wearable technology, 3D printing, and intelligent autonomous systems are just a few of the innovative technologies that have transformed how individuals live and work, as well as how organizations restructure their business models (Agarwal et al., 2010).

FinTech companies are disrupting the banking industry by offering payment solutions, aimed at developing the mobile payments market, personal lending, general insurance (Omarini, 2017).

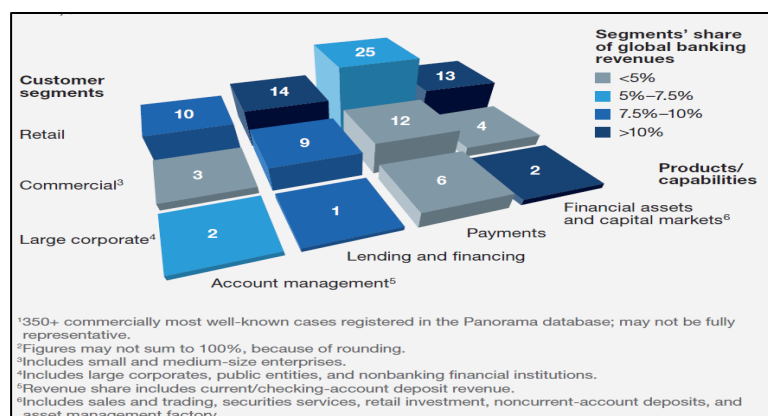


Figure 4: Customer segments and products of leading financial-technology companies 2015 (Dietz et al., 2016)

Figure 4, illustrates the gaps identified by FinTech's in three areas of retail banking, highlighting potential areas of improvement in terms of customer expectations and experience. This has allowed them to leverage this opportunity by developing solutions to bridge the gap (Dietz et al., 2016).

The business models of Fintechs are founded on the following attributes:

- *Simplicity*
- *Transparency*
- *Easy customer onboarding*

The rise of FinTech in banking has created an extensive range of imaginable opportunities for banks to endure stability and sustainability given the increased competition. It is fundamental for banks to adapt and utilize technology in product design, delivery, and service to improve customer experience (Ebrahim et al., 2021).

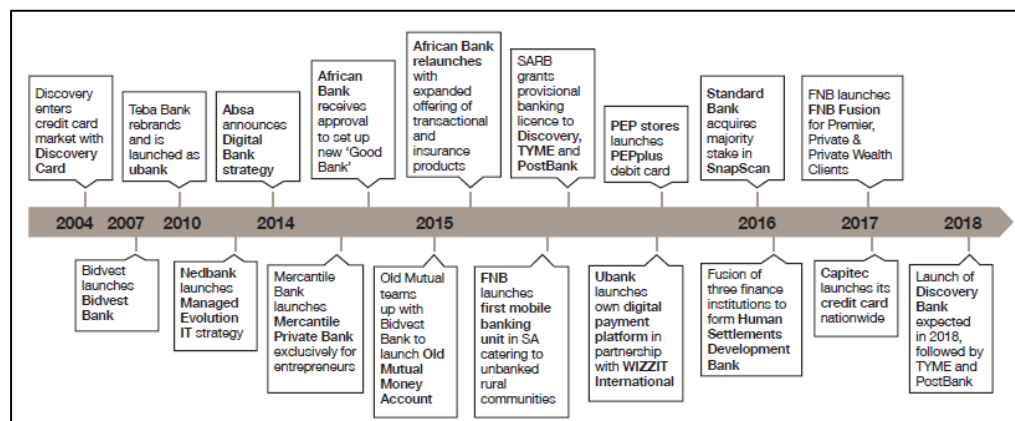


Figure 5: Recent developments in the South African banking market (Camarate & Maritz, 2018)

Figure 5, shows the timeline of the arrival of digital solutions with low-cost operating models developed by competitors (Camarate & Maritz, 2018).

The following experiences are being offered by banks to their customers (Ebrahim et al., 2021):

- *Improved digital banking experience to clients: Top banks everywhere have incorporated technological advancement by capitalizing in fourth industrial revolution technologies such as AI (artificial intelligence) typically in parts of client service trailed by governing compliances and risk monitoring.*

- *Personalized services for clients based on big data and fog computing: “Big data analytics refers to the gathering and analysing of huge datasets through computational processing is known as big data analytics, which is utilised to identify certain patterns” (Riahi & Riahi, 2018). Banks have already amassed an enormous volume of information on their customers. This information affords banks the opportunity to advance their operative performance by resourcefully exploiting the data gathered and developing new products and enhancing service delivery.*

Fog computing technologies “gathers and analysis data from mobile devices. This integrates predictive systems in the process of providing bespoke client offerings” (Hernández-Nieves et al., 2019). These bespoke product offerings and service deliveries entrench client relations and increase the profitability for banks.

2.5 Digital Transformation Frameworks

This part looks at the digital transformation frameworks that organisations can adopt to provide a structure to embark in their digital transformation journey.

2.5.1 Digitalisation Piano Digital Business Transformation Framework



Figure 6: Digitalisation Piano Digital Transformation Framework (Nwaiwu, 2018)

The framework (figure 6), which was published in a paper by the Global Centre for Digital Business Transformation, aims to clarify how a nexus that merges digital technology and current business models might lead to effective digital transformation and improved firm performance (Nwaiwu, 2018).

This conceptual framework's foundational principle is that the use of digital technology for a successful transformation must result in significant change in the business, which must cover these areas within the business structure: business model; internal structure; people; processes; ICT capability; offerings (products or services); and lastly, engagement models (Nwaiwu, 2018).

2.5.2 Comparative Digital Transformation Framework

Bumann & Peter (2019), conducted a comparative analysis on 18 digital transformation models and frameworks. The eighteen models and frameworks revealed have 115 dimensions (an average of six per model/framework). With a comprehensive cross-industry digital transformation framework, Figure 7 depicts the six action fields/dimensions. Business strategy, organization, culture, technology, customer, and people are among the framework dimensions.

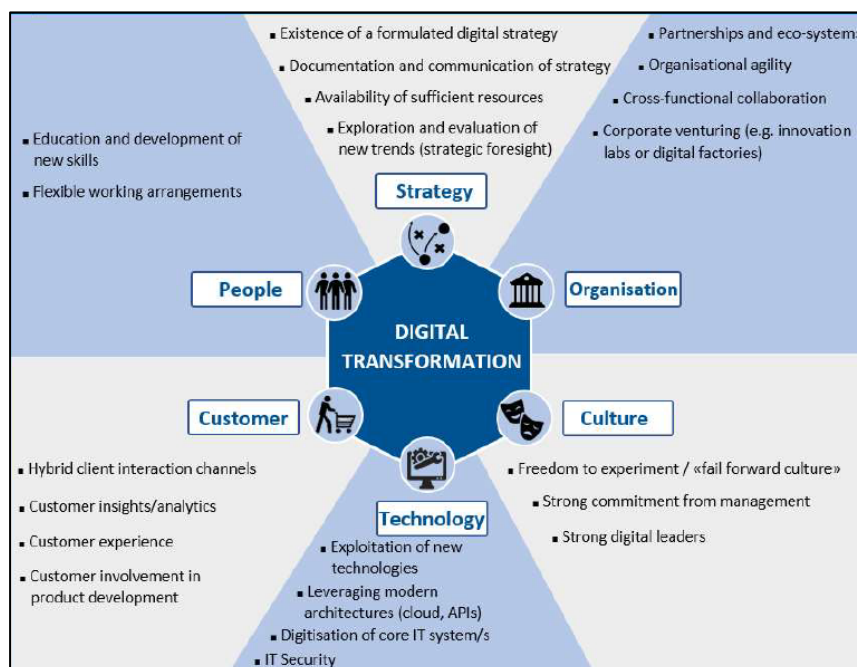


Figure 7: Digital Transformation Framework (Bumann & Peter, 2019)

According to Bumann & Peter (2019), each action field/dimension is defined and described, as well as how various events might assist organizations in their digital transformation path.

- *Strategy: The literature delves into hypothetical strategy principles and emphasizes the significance of developing a smart digital strategy for successful digital transformation.*
- *Organisation: According to Berghaus et al. (2017), this dimension includes essential factors such as collaborations and ecosystems. They may be said to adhere to the strategy dimension as well, but they are more closely associated with the organizational structure. Organizations must embrace a collaborative partnership-driven strategy by actively building and fostering respectful relationships with all stakeholders.*
- *Culture: For a successful digital transition, a company's culture and focus on the future are critical. The culture of digitally maturing firms shares similar features such as quick trialling a high-risk tolerance and a willingness to invest in people. Furthermore, they place a greater emphasis on soft skills in leaders than on technical abilities.*
- *Technology: The organization's approach to the usage of new digital technology is an important aspect of the digital transformation plan. Market leaders research and use cutting-edge technology such as artificial intelligence, machine learning, blockchain, and the Internet of Things, whereas market followers rely on tried-and-true solutions.*
- *Customer: Due to shifting customer behaviour and the growing popularity of digital channels, businesses are being compelled to create seamless hybrid interaction channels that bridge the digital and physical worlds. Customers should be able to communicate with businesses through both traditional and digital channels, and businesses must provide a consistent and channel-appropriate customer experience across all digital and non-digital channels.*
- *People: The employee, with the skills and competencies, falls under the people dimension. Aside from the numerous technology resources required*

for successful digital transformation, new human skills and experiences with a variety of digital technologies are also required.

In conclusion, the six digital transformation action domains or dimensions give a framework for organizations to master their digital transformation journey.

2.5.3 CapGemini Digital Transformational Framework

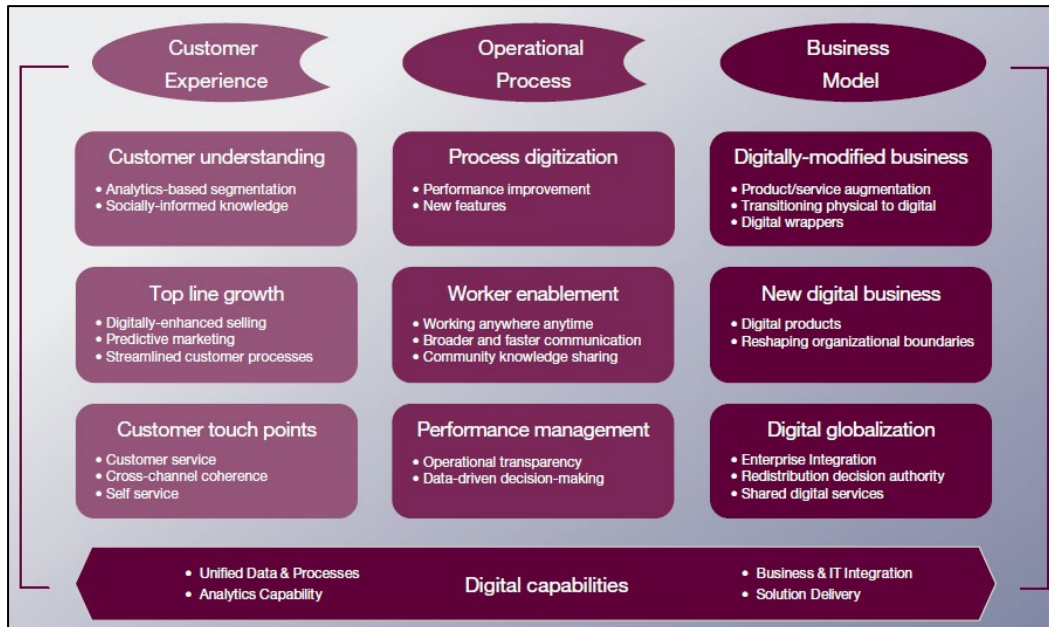


Figure 8: CapGemini Digital Transformation Framework (CapgeminiConsulting, 2011)

The digital transformation framework developed by CapGemini, (figure 8), focuses on three main elements of a company: customer experience, operational procedures, and business models. The nine parts that make up the three pillars provide a set of building blocks for digital transformation (Coundouris, 2020).

Pillar one customer experience. Knowing who your clients are and coming up with innovative client experiences. They begin the process on client experience and journey to larger matters of intricacy. Digital capabilities are displayed across the 3 pillars showing the support structure.

2.6 What digital product innovations are banks introducing in their digital transformation journey?

Banks are introducing digitally innovative products and services such as online banking, mobile banking applications, and creating new capabilities on ATMs as part of their digital transformation journey, according to the literature reviewed.

According to Pobre (2020), digital banking is converting traditional banks services and products and moving them to online platforms. Automating banking services and products contains converting cash deposits, withdrawals and transfers, the managing of transactional accounts, application for banking products, management of loans, effecting payments for bills and additional online banking services. Digital banking delivers tailored and suitable solutions that provide customers with personalized services, goods, and pricing. Banks have used individualized offers (such as micro-segmentation, tailored products and services), to boost client loyalty and sustain their competitive edge throughout the last decade (Kibble & Doyle, 2020).

The automation of traditional banking services such as transact accounts, lending, money management and services is known as digital banking and is offered to customers via on-line channels. Although brick-and-mortar branches exist today, the change to digital is significant. The internet and the universal growth in smart-phone utilisation has contributed to the transformation of traditional banking services and products to automated services and products. The emergence of digital banking has been driven by customer preferences for online services (Moneythor, 2020).

Some of the features and capabilities digital banking products and services offer customers include (Moneythor, 2020):

- *Account opening (Investments and Transactional)*
- *Better interest rates relative to traditional banking*
- *Device Apps*
- *Money management tools*

- *Real-time transaction notifications*
- *Digital wallets*
- *Digital cards and contactless payments*
- *Peer-to-Peer payments*
- *Out of branch deposits*

Shah (2021), describes digital product innovation in banking, as the creation of a digital core which will facilitate an enterprise-wide connection amongst banks systems (eliminating silos). Developing operational efficiencies to enhance customer experience and decrease operational expenses by providing reliable, correct, organisational-wide data permitting decision making across the business.

The way people manage their finances is changing, and digital banking systems are focusing on integrated infrastructure (Moneythor, 2020). Digital banking is intended to be extremely adaptive to accommodate altering clients wants. With the utilization of interconnected services, digital banking can offer bespoke offerings and augment enhanced functionalities faster and seamlessly relative to legacy banking systems. This is possible by developing digital products and services independent of each other and in a manner that supports agility to constant changes.

According to Moneythor (2020), banks are offering digital asset solutions with their services. Converging digital asset services example payments, wallets, and transfers. This provides customers agility and flexibility for expenses and managing their finances.

Industries are being disintermediated by digital technologies (Meena & Parimalarani, 2020). The banking industry has not been immune to this, the advancement of digital technologies and rising technology-smart customer expectations has certainly brought its fair share of challenges, which highlights the need for digitalisation. In the pursuit to gain competitive advantage, banks should pay explicit attention on how to adapt digital technologies to improve their performance; a strategy known as digital transformation (Carbó Valverde, 2017).

Of recent, the banking industry has seen significant transformations (Ditshego, 2018). The banking industry has been able to expand the number of touch points via which they may communicate with clients thanks to digital technology, which was previously limited to branch and telephony channels (Berndt & Saunders, 2010).

Digital technologies provide customers with the freedom to access banking services at their leisure (Kaur et al., 2020). ATMs, credit cards, debit cards, online payment services, online investments, insurance, electronic fund transfers, telephone banking, mobile banking, mobile application, and internet banking have all been added to the banking business as innovative digital banking services (Singh & Malik, 2019). By implementing digital products and services, banks are providing enhanced customer experience and convenience to customers (Nayak, 2018).

Zhao et al. (2019), further go on to state that the banking industry worldwide is observing a possible disruption in digital technology and FinTech evolution. This transformation has been motivated by various motives including financial globalization, technological progression, want for ground-breaking business models, and the rivalry among competitors to gratify the increasing client needs. The banking industry is being driven by the recent upsurge in financial technology to operationally innovate, in order to gain a competitive sustainable advantage.

Competitor banks and FinTech's are utilising technology to enable agile, customer-centric, and cost-effective financial services (Omarini, 2017). Fintech and digital product innovation are being integrated into banking operations as a response. Banks are collaborating with FinTech companies or forming their own innovation teams (Graham, 2016).

Collaboration between banks and fintech companies have grown. Initially, banks purchased fintech start-ups to prevent competitors from working with them (Ebrahim et al., 2021). This, however, did not produce the anticipated results since the bank was procuring technology solutions rather than addressing

recognized problems within the bank. To encourage fintech development and recognize investment opportunities, banks began supporting fintech incubators and commercial accelerators (Omarini, 2017).

According to Puckrin (2020), in order to get their digital products and services to market faster, numerous banks are adding additional system layers to their current core systems to enable a wider range of digital applications and databases. Long-term, legacy systems will need to be updated, which will incur significant expenses.

On the journey to adopt new system architecture, banks can be more flexible in their product creation methods, allowing them to be able to integrate with creative third-party service providers effortlessly (OECD, 2020).

Several fourth industrial technologies (4IR) are supporting banks with their digital transformation journeys (Ohene-Afoakwa & Nyanhongo, 2017).

- *Application programming interfaces (APIs), enable internal and external business units, as well as third parties, to connect to the bank's multiple systems.*
- *Banks with a virtual infrastructure can employ the service of cloud service providers, providing data storage facilities and ease of access to software applications online. This allows for large costs savings as well as speedy product deployment.*
- *The basis of a bank's digital transformation journey is strong data capabilities. Banks are empowered to provide appropriate product solutions to customer needs, becoming more customer-centric, as well as better monitoring their risk management efforts using real-time analytics; and enhancing their operations through organization-wide decision-making; provide personalised marketing and reduce client attrition; and optimize operations through enterprise decisioning, elimination of redundancies, and reducing client attrition.*

- *Having strong data governance is key to the success of banks, ensuring that data is accurate, complete, reliable, relevant, timely and is used for the intended purpose across the organisation.*
- *Infrastructure and data governance needs are being addressed by banks in South Africa. Guaranteeing that the data that is shared in the business, supports imperative business choices and eventually improves customer-centricity banks are adopting and implementing 4IR technologies like robotic process automation, artificial intelligence enterprise wide in their digital journey.*

To summarise; the financial eco-system is being disrupted by new entrants to the market called Financial Technology (FinTech's) providers (Vives, 2017). Traditional banks are responding by digitalising and improving their own operations or collaborating with FinTech's. A gap (niche) is identified in the market by FinTech's' and they introduce intermediary products and services to cater for the identified market, which has had repercussions for some of the banks, whereby value chains have been disintegrated (Hutton, Bhana, Allen, & Nursoo, 2019).

2.7 What is the intention/objective of these digital product innovations?

According to the academic literature reviewed, the goal of these digital product innovations is to increase existing customer product use, attract new customers, financially empower customers, improve, enhance customer engagement and experience through ease of use and ensuring that these products and services are useful to customers, create trust and security around digital banking, create process and operational efficiency, and create cost savings for both banks and customers.

According to ATKearney (2013), digital banking combines the best of both worlds: a modern client experience on the outside and a cost-effective operating model

on the inside, both enabled by digitalization and the technology, processes, and structures that enable it (refer to figure 9 below).

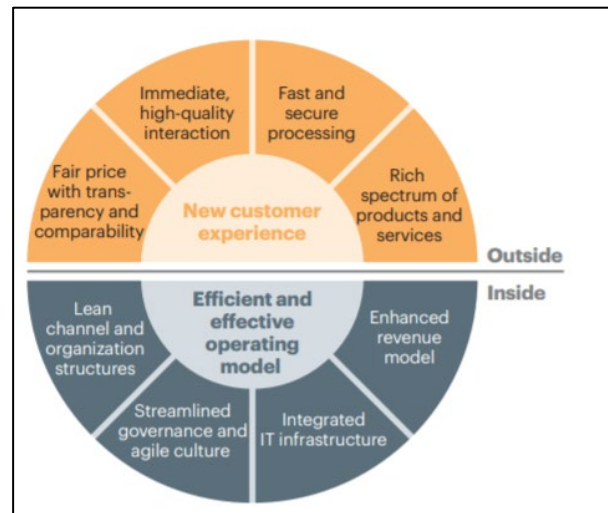


Figure 9: Digital banking offers the best of two worlds (ATKearney, 2013)

The outside pillar, customers gain from reasonable rates, better transparency, and comparison. Banks provide prompt, high-quality engagements to fulfil customer demands, and transactions are completed swiftly and safely. Buying something no longer takes days or hours. Customers are notified in advance about a variety of personalized products and services, such as financial guidance, new opportunities, and peer comparisons. Customers are often glad to hear from their bank and enjoy their banking experience (Eistert et al., 2013).

Assistance from the inside pillar is required to make this possible. To enable speedy processing, the core operational model will need to be redesigned, with a lean channel and organizational structures in place. To deliver great customer experience, decision-making and governance processes will need to be streamlined, and a new, more agile culture with the proper attitude will be required. To meet all requirements, an integrated IT infrastructure will be necessary, with rapid computing enabling super-quick processing. Finally, digital banking will change the revenue generation process. Deep consumer insights will

offer new revenue sources as customer centricity becomes more prominent (Eistert et al., 2013).

According to the United Nations (2016), The purpose of digitally accessible financial products and services is to assist emerging countries in reducing poverty and increasing financial inclusion. Digitalization in banking enables financial inclusion and aids in economic development, reasons for banks embarking on a digital journey (Nayak, 2018):

- *Increases efficiency: digitalisation allows for the facilitation and speedy delivery of seamless transactions thereby increasing efficiency and reduces the time of the transaction.*
- *Enhances service quality: modern banking enhances the delivery of service relative to traditional banking methods.*
- *Reduction of mistakes: due to efficient and enhanced maintenance of recorded transactions there is a decrease in human error.*
- *Savings: digital modern banking services attract lower fees compared to traditional banking services.*

A study by Sohoni et al. (2020), posits that, with the adoption and implementation of technology, banks can come up with innovative and creative ways of developing products and enhancing services that meet customer requirements more proficiently or economically. The solutions can offer:

- *Cost reduction resulting in improved and efficient delivery of products and services. Enabling customers to transact and engage with their bank in a flexible, seamless, and timely manner.*
- *Equips the bank to understand customer behaviour and needs, allowing improvement and personalisation of solutions.*
- *Enhanced platform service engagements and condensed time to market for products.*

2.7.1 Benefits of Digital Banking

The benefits of banks moving to a more digitally enhanced means of offering services far outweigh the initial cost. In the same way, digital banking intends to make banking simpler for clients (StatistaTavagaResearch, 2021):

- *Allows customers to complete banking transactions in the luxury of their homes.*
- *It offers the added convenience of allowing users to conduct banking transactions with around the clock accessibility of access to banking functions.*
- *Banking is becoming paperless. A customer is able to access their accounts at any time to check transactional services.*
- *Permits a customer to create automatic payments for payment of bills.*
- *Allows a customer to conduct on-line shopping. Internet banking is a significant enabler to online payments.*
- *Digital banking services are now being extended to rural areas and is seen as financial inclusion. Smartphones are becoming more affordable, and with internet access in rural regions, more people are accepting, adopting, and using digital financial services.*
- *With the assistance of digital banking, a customer is able to cancel cards. This advantage significantly supports the confidentiality and safety functionality for clients.*
- *By encouraging a cashless culture, digital banking limits the flow of illegal cash.*

2.7.2 Difference between Digital Banking and Online banking

The terms digital banking and online banking are used in a way that can be exchanged without making any difference. Online banking allows the customer to deal with ordinary fundamentals, such as balance checking, transaction reviews, and fund transfers. The goal of digital banking is to digitize the bank's operations, whether core or non-core. Essentially, this entails account opening,

servicing and closure. The aim of digital banking is to ensure that clients can manage banking operations in their time and at their convenience. Thus, online banking is a subclass of digital banking (StatistaTavagaResearch, 2021).

Banks are not extensively investing in their bricks and mortar branches; they are seeing growth in digital services. By developing digital services and products, this enables banks to cater to digitally savvy customers who are more likely to adopt digitally enabled services and products which results in growth and increased market share (Pobre, 2020).

According to Valchev (2020), digital banking services that are able to deliver a balance of innovation, convenience, and customer-centricity to ensure a seamless and efficient customer experience for customers via any device are deemed top of class. In these challenging times, banks compete not just with traditional banks, but also with FinTechs and other organizations who have discovered a market niche and are filling it by developing mobile financial services. Banks must provide unique products and services that are supported by excellent digital experiences. Valchev (2020), provides a list of digital banking services for a differentiated customer experience:

- Self-Registration: This service enables clients to register for banking services, for example, do it your self-account opening, irrespective of the device. When onboarding a new customer, the bank must gather and authenticate customer data, validate documents, guarantee legal aspects coverage, perform due diligence, and follow regulations.
- Credit facility take-up in a few clicks: Credit products is a key banking offering, transforming digital credit applications into an automated and easy process is vital. Application for a credit product is achieved in a few steps on a customer's device, with approval and receiving pay-out in under 24 hours. Banks consider the following points when embarking on a digital lending strategy:
 - *System integration, removing the need for a client to provide information that is already on in the system*
 - *Omni-channel experience to take up credit products*

- *Ability for the customer to upload and complete the necessary forms without exiting the mobile app or online.*
 - *The capability to save a credit request at any point in the application and reopen it later*
 - *Capability of eSignatures*
 - *Virtual consulting via video chat or chatbot*
- Instant P2P Payments: This service allows clients to transfer money instantly through their device of choice. Customers can send money to relatives and friends via their device using a linked bank account, a credit/debit card, or a wallet stored-value account.
- Digital card supervision: The digital card capabilities enhance digital card management with ease-of-use attributes to empower customers. Customers can very effortlessly set up signals for acquisition limits and provides a level of security enabling the customer to change the card PIN. The diverse set of attributes that advance digital card management is growing.

Below are some other significant capabilities:

- *Lock and unlock options*
 - *Management of payments*
 - *Applying for a new card easily online*
 - *Requesting limit increase online*
 - *Setting transaction limits*
 - *Locking card transactions by country*
- Mobile contactless merchant payments: This is a popular digital banking service and was fast-tracked due to the COVID-19 outbreak. To effect payment, clients tap their smartphone against a point-of-sale terminal (or other free-of-touch readers). It is a fast, suitable, and benign payment solution for both clients and suppliers.

- **Notifications:** This feature allows clients to remain on top of their financial activities. Customers receive account information, and it offers a level of security against fraud and theft.
- **Digital Insurance:** This product differentiates banks from their competitors. Offering personalised digital insurance enhances customer experience and advances customer health and wealth management while producing new revenue streams.
- **Money Management:** Customers choose a bank which can assist them to manage and meet their financial goals as well as make better financial decisions. Money management solutions differentiate banks from their competitors. Money management solutions incorporates digital capabilities that permit clients to accomplish their financial goals.
- **Reward Programs:** Loyalty rewards are popular for clients who want to save money. Clients choose products based on the reward value they will receive. A digital rewards program can be highly competitive for the bank permitting them to retain customers and create brand loyalty.
- **Chatbot:** This service is becoming prevalent in the banking industry with its increased demand and adoption, supporting clients with effective self-service. Chatbots can answer to general requirements, lessening customer fees and can engage with customers via omni-channels.
- **Security Settings:** Clients are provided with supplementary control when utilising digital banking. Banks must educate and create awareness by prompting customers to change their passwords. There must be an added level of assurance that each transaction is constant, appropriate, and provides customers with the control needed.

According to numerous studies, banks are introducing digital product innovation products and services with the goal of ensuring digital financial inclusion by using digital means to reach low-income and rural populations with a variety of financial services, and improve client engagement through products, efficient service, and improved channels, and attract new clients as well as include the low-income and rural segment customers.

2.8 1.To explore whether digital product innovations introduced by banks is achieving the desired results

In this section we will explore if the introduction of digital product innovations (discussed in section 2.7), which are a subset of the broader concept of the digital transformation of the banks journey is achieving the intended outcomes envisioned by banks. From a banking perspective, empirical studies have revealed that banks are on track to achieve their digital transformation goals.

Household savings rates improve when banks utilize SMS "nudges," according to research conducted in Bolivia, Peru, and the Philippines. Even for low-income people, the complete spectrum of savings, credit, and insurance products becomes cost-effective to give (Frisancho, 2016).

According to a study done by McKinsey Global Institute (MGI) (2016), providing consumers with digital solutions might save them 80 to 90% of the cost of employing physical bank offices (figure 10). This enables banks to serve a larger number of customers profitably by providing a wider range of products at lower prices. In the future, many people may start saving money through their digital accounts. Customers who utilize digital payments generate a trail of receipts and purchases that banks can review to assess their credit risk. Banks may confidently authorize loans for a bigger range of applicants using this information. Banks can also automate the collection of digital repayments and send SMS reminders to borrowers who are behind on their payments.

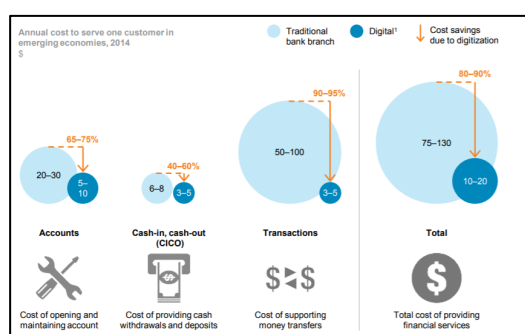


Figure 10: Digital technologies cut the cost of providing financial services by 80 to 90 percent (McKinsey Global Institute (MGI) (2016))

Magotra, Sharma, & Sharma (2019), in their study found that the introduction of digitally enabled services and products in the banking industry is an important business element that enables clients to operate their bank accounts with simplicity and efficiency. Undeniably, digitally enabled services and products such as ATMs, Internet banking, mobile banking has permitted banking clients to perform their banking transactions at their convenience (Manikandan & Chandramohan, 2016).

Ramavhona & Mokwena (2016), in their research found that the banking sector worldwide offers digital banking to their clients which provides ease of access to banking products and services. According to Lauer (2015), banks have started to offer digital financial services to the financially excluded and underserved, building on years of attempts to improve access channels in order to reach new customers. Due to major advances in the accessibility and cost of digital financial services, customers in rural and low-income areas are migrating away from cash-based transactions and toward formal financial services. Customers and the economies in which they and their family live benefit from this success, which includes economic growth and stability.

Banks in South Africa, like banks elsewhere in the world, offer digital banking services to their clients. From the customer perspective empirical studies show that despite banks offering these services it was found that the majority of South Africans in rural parts of the country do not adopt and utilise digital banking even though it offers convenience, and banks promoting digital banking awareness and security (Ramavhona & Mokwena, 2016). The main reasons for the non-adoption of digital product innovations were found to be a lack of information regarding services and benefits such as ease of use and the enhanced convenience of performing financial transactions from any location (Masocha & Chiliya, 2011).

Customers in South Africa's rural communities are concerned about the security of online banking transactions, believing them to be easily prone to fraud. As a result, retail bank customers are less likely to use online banking services. Most

retail bank customers in rural South Africa will accept digital banking if their lifestyle, values, and particular needs are satisfied (Ramavhona & Mokwena, 2016).

According to Ramnath (2018), financial services are not easily accessible to the rural populace. Due to the significant costs of maintaining brick-and-mortar branches in rural areas in today's business environment, banks are closing these locations. Customers in rural areas are thus excluded from participating in the financial sector. The rural population of South Africa suffers a number of hurdles in receiving financial services due to geographical locations and associated costs. Digital banking allows customers to access financial services from any location and at any time. In remote areas of the country where there are no brick-and-mortar branches, digital banking services offer a theoretically cheaper way of engaging and dealing with banks.

Ozili (2018), claims that the terms "availability" and "accessibility" should not be used interchangeably. There appears to be considerable misunderstanding between the larger concepts of "digital financial inclusion" and "access to finance." We must acknowledge that making digital products and services available to everyone without discrimination will improve the lives of those who have bank accounts and want to make simple financial transactions on those accounts using personal digital devices. In some emerging economies, access to digital finance services and products is mistakenly associated with availability of digital finance services and products.

According to Ozili (2018), in this scenario, clients find it more cost-effective to conduct their banking in branches rather than through online digital channels". This means that, while modern technologies are available to rural and low-income clients, they are not easily accessible. He goes on to say that, even if digital products and services are made available to everyone, rural and low-income consumers will only benefit if access to these digital products and services is inexpensive.

Banks in emerging markets now provide digital banking services and products, but this does not guarantee that rural and low-income customers can afford to use them. It's important to remember that weak or absent electrical infrastructure, roads infrastructure, technological infrastructure, access to technology, knowledge skills (literacy and numeracy), trust concerns, security, language obstacles, and cultural considerations are all major barriers to digital financial adoption (Armstrong, 2020).

According to Neog (2019), banks are undergoing a rapid digital transition, delivering a variety of digital banking services and products to their customers. According to his research, the adoption of these products and services is contingent on client knowledge and/or appropriate information being disseminated. In a study conducted on the adoption and use of these products and services, it was discovered that rural areas had lower adoption rates than urban areas. At times customers are conscious of several digital products and services but they do not intend to utilise these and on the other hand some clients are oblivious about the presence of such services. It is therefore imperative to research whether digital banking products and services aids in financial inclusion and adoption of digital banking services by rural and low-income segment customers and what hinders the adoption, acceptance and utilisation of these digital product innovations (Neog, 2019).

Banks do not have similar confines that prohibit them from serving rural and low-income clients a decade ago (Salman & Jenik, 2020). The advancement of digital banking has created new opportunities for reaching rural and low-income clients. However, they pose the question, are these digital banks more inclusive? Just because digital banks can reach rural and low-income clients, this does not mean that these services and products will be accessible and adopted. Preliminary data collected by CGAP advocates, indicate that some digital banks are becoming more inclusive. Initial research points to some explicit ways in which they are reaching rural and low-income clients with more valuable and inexpensive services and products (Jeník et al., 2020).

Despite banks implementing digital solutions, they are not seeing a decrease in the cost of operating expenses and reduction of feet in the branch channels, especially in rural areas as well as from low-income customers in the urban areas. Accessing these services by the low-income and rural customers does pose challenges (Kaur et al., 2020).

2.8.1 The Digital Divide

Chetty, et al. (2018), states the digital divide is categorized by two vital difficulties, viz., (1) inadequate and expensive infrastructure and (2) inadequate digital literacy skills in rural and low-income groups. Rural and low-income communities have inadequate access to ICT owing to exorbitant prices and an overall absence of infrastructure, extending from a sporadic source of electricity to inadequate accessibility and availability of ICT facilities.

The first barrier relates to expensive electricity, access to the digital eco-system is essential to have a charged smartphone. According to StatsSA (2019), 85% of homes in South Africa are connected to electricity. Underprivileged homes might not have enough money on a regular basis to use electricity sources (MyBroadBand, 2020), due to electricity prices increasing, which has hit South Africans hard.

In addition to high electricity costs, exorbitant mobile data prices, hinder access to digital financial services that require the use of smartphone apps or mobile websites. 1GB of data costs roughly USD7.5 in South Africa, whereas it costs USD4.9 in Kenya, USD2.8 in Uganda, and USD2.3 in Tanzania. Low-income consumers are more affected by the high expenses of downloading and using applications than middle- and upper-income consumers (Healing, 2019).

The second impediment is the population's lack of financial literacy in South Africa. Understanding and utilizing the appropriate financial offers necessitates financial literacy. The Organisation for Economic Co-operation and Development (OECD, Digital Divide, 2006) defines “financial literacy within four categories: *financial control* - an individual's ability to manage their daily finances and make

ends meet; *financial planning* - an individual's ability to set financial goals and work towards them; *product choice* - an individual's knowledge and use of available financial products; and *financial knowledge* - an individual's basic numeracy skills and understanding of financial concepts such as inflation, interest, and risk diversification".

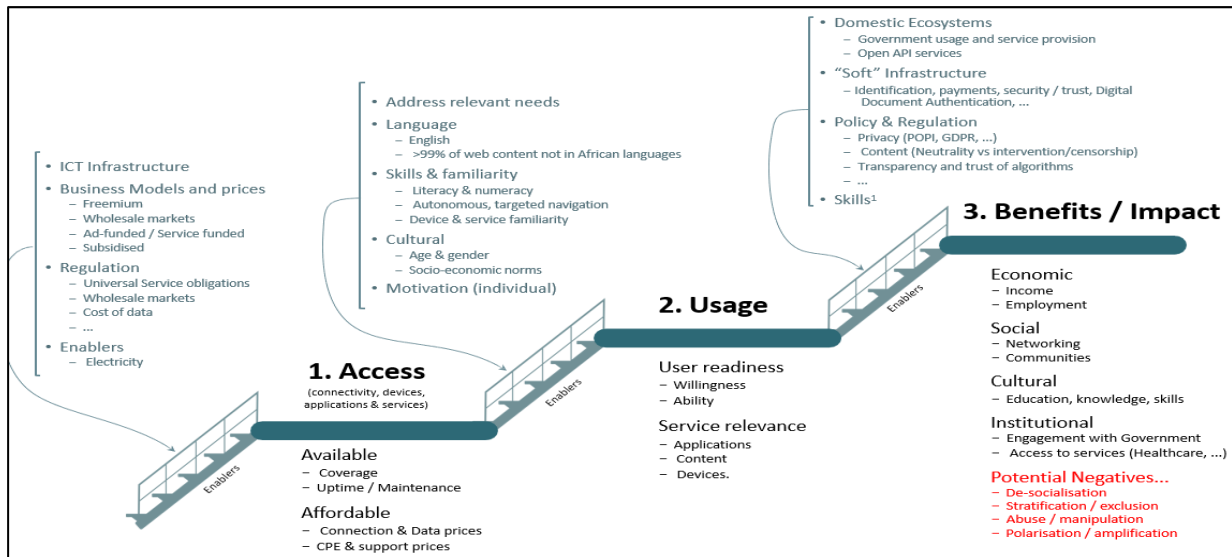


Figure 11: Components of the Digital Divide (Armstrong, 2020)

Figure 11 describes the components of the digital divide (Armstrong, 2020) :

1. Access:

- *Availability refers to the availability of the ICT infrastructure required for access and Internet usage tiers*
- *Affordability refers to the cost of access in relation to one's income and the level of competition in the online market.*

2. Usage:

- *Relevance of the service: the presence and scope of local language and relevant material.*

Readiness is a person's skill to use the Internet, as well as their abilities, cultural acceptance, and policy support.

3. Benefits:

- *Economic*
 - *Income*
 - *Employment*
- *Social*
 - *Networking*
 - *Communities*
- *Cultural*
 - *Education, knowledge, skills*
- *Institutional*
 - *Engagement with Government*
 - *Access to services for example healthcare*

Below is a list of information, communications and technology challenges facing poor low-income and rural segment clients (Nayak, 2018):

- *Impaired levels of literacy: it is self-evident that using digital financial services necessitates awareness and knowledge. Most people in rural areas do not have access to banking due to a lack of banking awareness and financial literacy.*
- *Lack of infrastructure: digitalization in rural areas necessitates the availability of infrastructure, particularly energy and communication networks.*
- *Access and ownership of smart phones: most digital services and products are available to people that have a smart phone. USSD services are available on normal phones however the product and services transactions are limited. The number of people in rural areas owning and utilising a smart phone is far less than the people in urban areas, which is a big deterrent in the*

implementation and adoption of digitalization by poor low-income and rural segment customers.

- *Lack of financial literacy: the financial literacy among low-income and rural segment customers is low because individuals are not aware of the modern methods/channels of banking.*
- *Cash economy: customers in the low-income and rural segments rely heavily on cash to cover their daily requirements, as most transactions are conducted using cash or barter.*
- *Customer resistance to new technology: low income and rural segment customers do not adopt technology easily; this is mainly due to lack of awareness.*

2.8.2 Framework for determinant factors of digital divide

Chalita & Erik (2018), created a framework (figure 12 below), which shows the elements of the digital divide. Their findings reveal that the digital divide is still a major topic in policymaking, affecting social, economic, and political challenges. Due to the multiple aspects of determinant factors, the results suggest that the digital divide is a complicated phenomenon. To acquire a better understanding of the digital divide, recent research has considered socioeconomic, institutional, and physiological aspects.

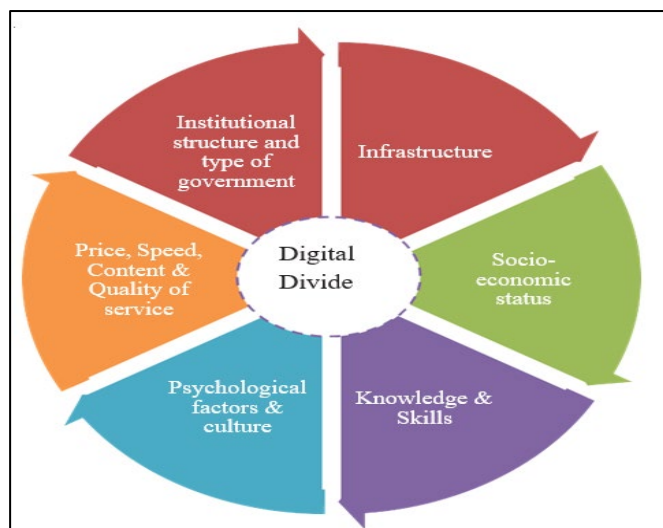


Figure 12: Framework for the determinant factors of digital divide (Chalita & Erik 2018)

The below factors have been identified as challenges of adopting and utilising digital product innovations (Singh & Malik, 2019):

- *Financial literacy and not literacy alone: most individuals in the rural segment find it difficult to complete simple traditional banking services example completing bank forms. It is quite challenging on a person, to be part of the financial eco-system as it demands not only being literate but expects a degree of financial literacy.*
- *Vulnerable system and the mistrust: the fallacy is that if money is in a bank, it can go missing or they won't be able to withdraw it, making customers wary of using digital services. Fraud is on the rise, and this does cause mistrust in the financial system.*
- *Landscape of rural segment: maximum needs of rural individuals rest on cash transactions and introducing digital financial solutions can be very intimidating. With the rural segment being informal and muddled, cash is a more ideal means of serving their financial needs.*

According to Kumar (2018), what has occurred in the banking sector over the last decade would not have been conceivable without the use of technology. Despite the banking industry seeing massive transformations in terms of technological adoption and execution, the advantages did not reach rural and low-income customers.

In a study conducted by Mlitwa & Tshetsha (2012), the attitudes of South African rural people toward cell-phone banking were investigated, and it was discovered that many low-income and rural customers do not use cell phone banking. Many people are unaware of it, and those who are aware of it do not use it. Rural customers may be apprehensive to use or trust cell phone banking for a variety of reasons. The most important of these was a lack of understanding of the facility, which was most likely attributable to a lack of awareness. In the findings, trust concerns surfaced regularly, and a mobile device was not viewed as an acceptable alternative tool for managing one's finances. As a result, financial institutions may need to establish a marketing plan specifically for rural

customers. It's worth noting that the few customers who embraced and used cellphone banking said it provided them with ease and speed because they could send money at any time. Thus saving money because they didn't have to go to a branch to make the transfer.

2.9 Proposition Development 1

Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.

2.10 To explore whether the introduction of digital product innovations drives any unintended results

This section will explore whether the digital product innovations outlined in section 2.6 are causing any unintended consequences.

There are limited empirical studies conducted on how banks have deployed digital product innovations as part of their digital transformation journey, to evaluate if any unexpected repercussions have occurred for their rural and low-income segment customers. The banking business has evolved dramatically as a result of technological advancements; yet, the rate of acceptance of technology-enabled financial services differs by country (Takeddine & Sun, 2015).

2.10.1 Models used in establishing technology acceptance/adoption

Researchers have conducted multiple studies using different frameworks to investigate the relationship between banks' adoption of digital product innovations and the unintended consequences/ implications on its rural and low-income segment customers.

2.10.1.1 Technology Readiness (TR) Model

The inclination to adopt and utilise new technologies to achieve one's tasks is known as technology readiness (TR), (Parasuraman, 2000). The TR concept can be observed as a complete state of observance resulting from a holistic set of intellectual promoters and detractors that jointly control an individual's tendency to utilise new technologies. The model was created to study people's overall philosophies about technology, figure 13 below. The model consists of 4 elements: optimism, innovativeness, discomfort, and insecurity. Two of these traits, optimism and innovativeness, serve as technological readiness drivers, influencing an individual's willingness to accept new technology. Discomfort and insecurity, the other two dimensions, operate as technology readiness inhibitors, slowing or prohibiting the adoption of new technology (Lin et al., 2007).

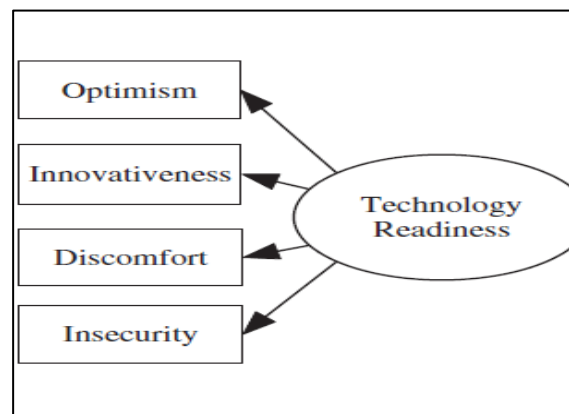


Figure 13: Technology Readiness Model (Lin et al., 2007)

Berndt & Saunders (2010), undertook a study with the goal of determining the elements associated with the Technology Readiness Index (TRI) and their presence in a developing country, a subject that has received little attention from academics. They state that although South Africa's banking industry is sophisticated for an emerging economy, delivering financial services to the country's "poor socio - economic backgrounds" remains a difficulty. "People's tendency to embrace and apply new technologies for fulfilling tasks in their home life and at work" is how technology readiness is characterized.

The results showed that “the TRI score for urban consumers in emerging countries was 2.53, which is significantly lower than the 2.88 score for urban customers in a mature economy like the United States. Customers are less willing to adopt technology when this is considered. When developing products and improving services and procedures, banks must keep this in mind. This means that banks will introduce technology that the market isn't ready for, reducing its acceptance and long-term viability. To stimulate use of newly developed technology, it must be easily accessible, as well as customers' willingness to adopt new technology. Banks have introduced technology that is now being used by one or more market segments. The broader market's technological readiness, particularly among the next adopter group of customers, will influence the speed and success of this technology's adoption by a broader market sector. This puts the onus on the banking industry to figure out how to stimulate technological usage (Berndt & Saunders, 2010).

Ferreira et al. (2013), created an upgraded model for consumer adoption of technology products by incorporating components from the consumer behavior literature, the Consumer Acceptance of Technological model (Kulviwat, et al., 2007), and the technology readiness construct (Parasuraman, 2000). The proposed model considers the links between cognitive and affective aspects as well as technology preparedness. On a sample of 435 customers, they employed structural equation modeling, and the results revealed strong correlations between the constructs studied, demonstrating that consumers' technology preparedness has a significant impact on their adoption of new technologies.

In their study, Blut & Wang (2019) reviewed data from 193 independent samples gathered from 163 publications reported by 69,263 persons. Their findings revealed that motivators have greater correlations than inhibitors, but that these TR characteristics influence technology adoption through several mediators. It is vital for banks to understand the relationship between technology readiness for banking technologies and the readiness and technology-related adoption and behavior of their low-income and rural segment consumers (Blut & Wang, 2019).

2.10.1. 2 Technology Acceptance Model (TAM)

According to Davis et al. (1989), there are two factors that determine how an operator embraces digital technology: perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness is defined as "the degree to which a person believes that adopting a certain system will improve his or her job performance" (Josefsson, 2017).

This aspect depicts how people utilize or don't utilize an application depending on whether they think it will help them perform better. However, this is insufficient to determine if a user will embrace the technology. Although it helps users reach their goals more easily, it does not ensure a simpler operator experience, which is why PEOU is so important. PEOU stands for "the degree to which a person believes that using a specific system would be painless" (Davis et al., 1989). It is critical to find a balance between the two factors to avoid the risk of the intricacy of usage overshadowing the benefits of utilization. This demonstrates that usability is influenced by simplicity of use. The Technology Acceptance Model (TAM) was created because of these 2 factors (Figure 14).

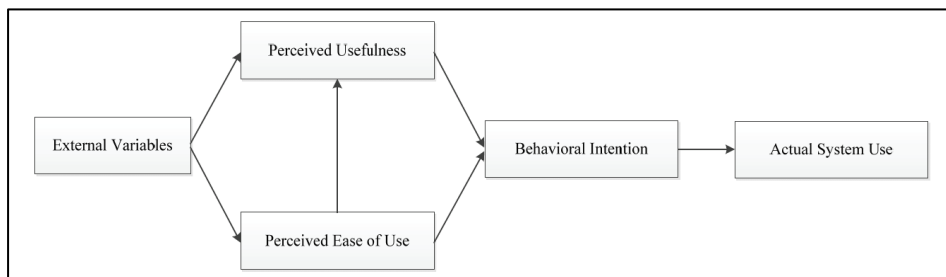


Figure 14: Technology Acceptance Model (Josefsson, 2017)

Hough & Chan (2016), conducted a study in South Africa to determine the factors that might influence digital banking acceptability. After collecting data from 252 individuals, they observed the following important associations using an enhanced version of the TAM, which was recognized as an adequate framework for identifying the factors of technological acceptance: "Perceived Time Risk has a significant negative impact on Attitude; Trust has a significant positive impact on Perceived Usefulness; Perceived Usefulness has a significant positive impact

on Attitude; Perceived Usefulness has a significant positive impact on Attitude; Perceived Usefulness has a significant positive impact on Behavioural Intention; Perceived Ease of Use has a significant positive impact on Trust; Perceived Ease of Use". The study's findings may help banks enhance their performance in terms of improving digital banking services.

Islam & Ahmed (2020), conducted a study in Bangladesh with the goal looking at people's intentions to use digital banking services. Their research used the Technology Acceptance Model (TAM) together with two new dimensions, perceived satisfaction and social impact, to establish a conceptual framework based on existing literatures relevant to digital banking uptake. Based on convenience sampling, data was collected from 326 citizens across Bangladesh using a standardized questionnaire. To explore the predictors and their correlations with behavioural intention to use internet banking, the researchers used multiple statistical methods (descriptive analysis, reliability test, correlation, and regression analysis). Perceived usefulness, social impact, and perceived enjoyment were revealed to be important predictors of persons' desire to use internet banking services in Bangladesh, according to the findings. The findings also revealed that perceived utility had the greatest impact on an individual's behavioural intention to use online banking in this country, outweighing social influence. Their research helps academics gain a theoretical understanding of prolonged TAM with reported enjoyment and social influence. The study's findings may help banks improve their performance in terms of improving digital banking services in the modern banking era.

Chitungo & Munongo (2013), conducted an empirical study in Zimbabwe to see if an extension of the well-known Technology Acceptance Model (TAM) can be used to figure out what elements influence rural communities' willingness to adopt digital banking services. Only 275 usable surveys were returned out of 400, producing a response rate of 69 percent. The SPSS software was used to analyze the results. The results show that the extended TAM can predict whether or not a customer would utilize mobile banking. Perceived utility, perceived simplicity of use, relative advantages, personal innovativeness, and societal

norms, in particular, have a substantial impact on users' attitudes, influencing their intention to use mobile banking, whereas perceived risks and costs hindered adoption.

2.10.1.3 Technology Readiness and Acceptance Model (TRAM)

Simiyu & Kohsuwan (2019), describes TRAM (figure 15), as an amalgamation of the Technology Acceptance Model and the Technology Readiness Index (TRI). This paradigm was proposed for the first time by (Lin et al., 2005). TRAM aims to provide light on how individuals accept new technology. The adoption of digital banking in emerging nations is influenced by a number of factors, including perceived usefulness, perceived advantage, perceived danger, social impact, and perceived cost (Gandhi & Sheorey, 2017).

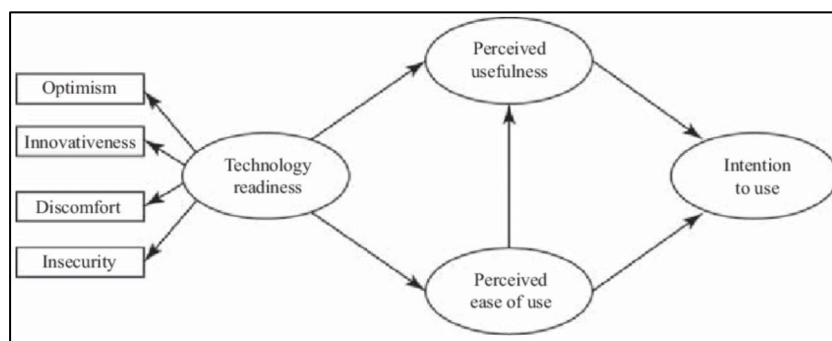


Figure 15: Technology Readiness and Acceptance Model (Kim & Chiu, 2019)

Acheampong, et al. (2017), conducted a study in Ghana to anticipate user adoption and use of e-payment technology, researchers enhanced the technology readiness index and analysed its impact on the technology acceptance model. The demographic of 1500 users were polled using an online version of a questionnaire. A robust version of the feed forward Radial basis function neural network was used to analyse the post-data integrity outcomes. In both situations, they found a non-inflated overall inaccurate prediction score of less than 25%. It decomposed into a positive and substantial association between “personal innovativeness, optimism, high perceived convenience and usefulness, and perceived ease of use”, all of which influence digital banking adoption

positively. In the event of personal insecurity and discomfort, negative impacts were observed, which are consistent with existing literature.

According to Musyaffi et al. (2021), e-banking technology has advanced at an incredible rate, paralleling the expansion of digital banking. E-banking has resulted in changes in business models, particularly in terms of consumer convenience and rewards. However, it turns out that consumers are still dealing with security concerns when it comes to e-banking services, resulting in user unhappiness. Using the integration of the Technology Acceptance Model (TAM) 3 and Technology Readiness Model, their study attempted to investigate the elements that cause users to accept e-banking, particularly in terms of Perceived Usefulness, Technology Readiness, and Self-efficacy. They collected data from 565 respondents who responded to an online survey. Their findings showed that technological readiness and self-efficacy influence perceived usefulness, and that perceived usefulness and technology readiness had a favourable impact on behavioural intention. Self-Efficacy, on the other hand, has no bearing on behavioural intention.

The findings of their study also show that the level of acceptability of user technology employing TAM 3 models in conjunction with Readiness Technologists is high. The self-efficacy variable, on the other hand, has no bearing. The findings suggest that the majority of e-banking users in this study are young persons between the ages of 21 and 40, with only a handful over 50. It means that young people increase the quality of e-banking; each category requires a distinct strategy.

More effort should be put into teaching elderly consumers about the benefits of using e-banking services. Banks must concentrate on developing systems that can handle demographic factors including age, ease of use, education, and gender. The importance of education in the adoption of e-banking cannot be overstated.

2.10.1.4 Outline of emergent themes and key variables in consumer resistance to digital product innovations research model

One of the primary causes of every invention's failure is consumer resistance to innovation (Talwar et al., 2020). Customer resistance to digital product innovation is just as crucial as the factors of acceptance and adoption (Seth et al., 2020).

Customer resistance to digital product innovations, according to content analysis studies, can be categorized into the following categories: non-adoption (postponement, opposition, and rejection), socio-demographic features, methodological views, and outcome factors of inaction are all discussed, as well as theoretical underpinnings, impediments to digital advances, and qualities inhibiting or encouraging resistance. Figure 16 depicts these characteristics as well as the factors that contribute to consumer resistance to digital product innovation (Seth et al., 2020).

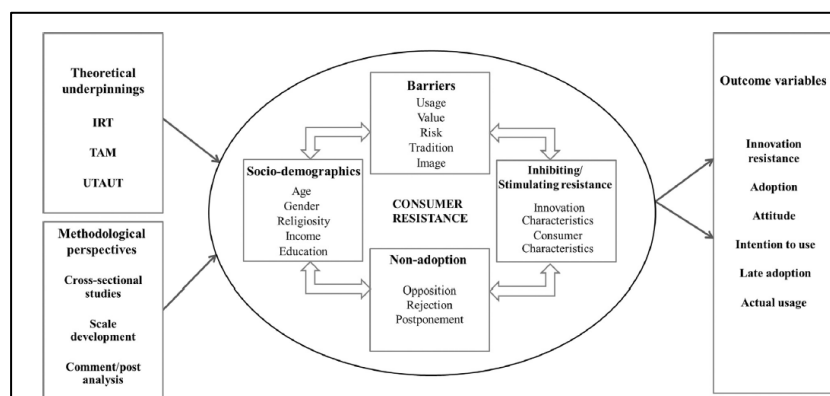


Figure 16: Outline of emergent themes and important variables in consumer resistance to digital product innovations research model (Seth, et al., 2020)

Customer resistance to digital product innovations has been studied, and several customer behaviour ideas have been used to describe customer resistance and non-adoption of these technologies. The innovation resistance theory (IRT) provides a wealth of information about how customers react to new products. Value, IRT, risk, and usage aspects represent practical hurdles to innovation, whereas ritual and image elements represent psychological barriers. The usage element refers to the service's usability as well as customers' willingness to adapt

to use the innovation; the value element denotes the substitute's comparative performance to the cost value; and the risk element denotes customers' perceptions of the risk in the product or service innovation; the ritual element refers to how things have always been done, while the image element refers to how simple it is to use. In a digital context, the utilization element denotes time commitment, whereas the risk element denotes financial load and indecision in decision-making (Heinze et al., 2017).

Other well-known academic models, such as the Technology Adoption Model (TAM) and the Unified Theory of Acceptance and Use of Technology, have been merged with the IRT model (UTAUT). TAM's perceived usefulness and ease of use, two crucial qualities, have a big influence on resistance. The perceived usefulness of digital banking has a substantial impact on resistance, whereas perceived ease of use is persuasive in lessening resistance (Parasuraman, 2000).

According to Chung & Liang (2020), previous research has focused on the incentives that encourage the use of digital product innovations; however, their study took the reverse approach, aiming to identify and categorize customer resistance to digital product innovations. They collected 348 valid samples in total. Their findings revealed that customers are faced with changes brought on by innovation to some level, and innovation resistance is their response to such changes. Consumers will adopt the innovation once resistance to it has been overcome. As a result, when reacting to innovation, innovation resistance can be understood as a habit or a process that must be completed before innovation can be implemented. With the exception of the risk barrier, their research found that innovation resistance had a considerable impact on user intention.

The degree of risk that the innovation carries is referred to as the risk barrier. Customers must accept risk in order to embrace innovation because it comprises several unknowns and potential surprises. If a digital product innovation's software or hardware is difficult to use, it will limit people's desire to use digital products and services. Also, because of the image barrier in the finance industry,

when a new product has a negative image, the likelihood of using it is low. As a result, banks must package their products in such a way that they lower the possibility of an image barrier and improve people's willingness to utilize them.

Based on preceding research, which used multiple models to analyse customers' acceptance, adoption, and use of digital product innovations, it is possible to conclude that many factors encourage and inhibit the acceptance, adoption, and use of digital product innovations. These innovations are not causing unexpected consequences; yet, despite the new technology used by banks to establish successful strategies that will attract increased usage and generate higher profits, the acceptance, adoption, and usage of digital product innovations is relatively low.

These studies found that banks must develop user-friendly solutions to reduce the complexity barrier and encourage customers to adopt digital product innovations. Data encryption, on the other hand, might be used to lower the risk barrier and accelerate acceptance of digital product innovations. To enhance client acceptance of digital technologies, banks must create awareness, training, and education that lowers the literacy barrier.

The banking industry must understand that there are numerous barriers experienced by low-income and rural segmented customers, in adopting and utilising digital banking services (Chakrabarty, 2011). So how are banks ensuring digital financial inclusion of these clients. Durai (2019), in his study states that digital product innovation in banking incorporates services, products, technology and platforms, providing the ability to customers to open accounts, conduct payments, transfers, investments, insure and credit facilities through digital channels, whenever, wherever, without having to go to a branch or directly interacting with the banks personal.

Most South African customers do not take advantage of digital financial goods and services to their full potential (FinMarkTrust, 2016). In South Africa, 77 % of the adult population is banked, indicating a high level of financial inclusion. The

quality of financial inclusion measure below, figure 17 shows that most of the adult population is banked (top bar), but that the majority of financially included adults in South Africa are underserved (bottom bar). This is due to a lack of acceptance of modern banking products and services, as well as a lack of knowledge of financial products (FinMarkTrust, 2016).

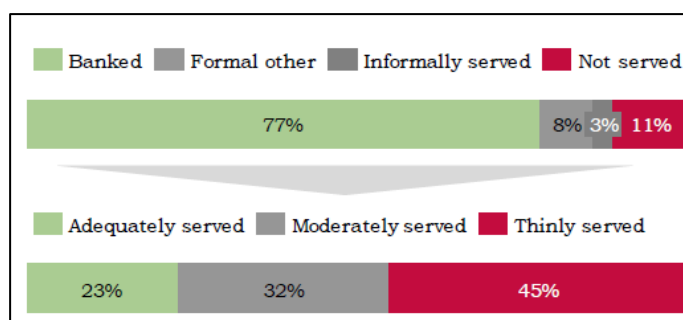


Figure 17: Financial access strand in South Africa (FinMarkTrust, 2016)

In response to the projected benefits of financial inclusion and digital finance, governments in a number of emerging nations have imposed expectations on customers to adopt and use digital financial services and products through their financial system regulators. Banks set limits on day-to-day withdrawals, charging exorbitant fees for cash withdrawals, in branch deposits, card replacements and bank statements. Convincing customers to adopt 'digital' channels which may enhance the wellbeing of customers (Ozili, 2018).

Despite the fact that banks are requiring their clients to adopt digital product innovations, this may result in customers registering on the digital channel but refusing to use it. Banks will eventually realize that imposing financial demands on the 'banked' population does not result in involuntary financial inclusion; instead, demands work on the population that has formal bank accounts (Ozili, 2018).

Within the African countries, South Africa is classified as being the utmost developed digital economy, with mobile phone exceeding 90% of the population with a 69% utilisation of smartphones (Bahia & Suardi, 2019). South Africa has the highest levels of digital literacy relative to other developing African countries

allowing banks a great opportunity to develop digital solutions for their customers (StatsSA, 2015).

According to FinScopeSA (2017), over the last decade, financial inclusion has improved dramatically. In 2017, over 34 million adult South Africans (89%) utilized some form of formal financial service or product, up from just over 20 million adults (64%) in 2007 (figure18).

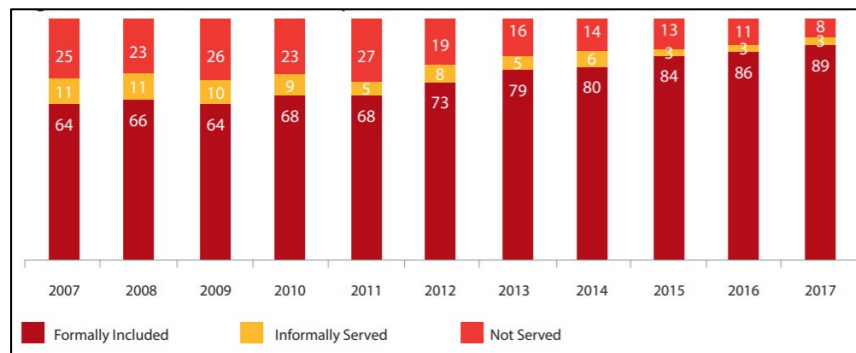


Figure 18: The financial inclusion landscape in South Africa (FinScopeSA, 2017)

The following are some of the factors that have led to this improvement (FinScopeSA, 2017):

- *Introducing the Mzansi bank account and financial services companies' subsequent enhancement of acceptable and inexpensive products;*
- *The premise that South Africa has a robust formal banking presence and a financial services network infrastructure;*
- *A technological advancement in the delivery of financial services*
- *A strong emphasis on customer literacy; and*
- *An innovative technique of distributing social subsidies to recipients that entails transferring monies from cash to bank accounts.*

Through the advancement of technology, banks now offer several electronic or direct routes for accessing financial services. Low-income and rural segment customers benefit from the increased transactional capabilities of point-of-sale payment devices in stores, which are aided by both banks and retailers.

Consumers can use these devices to pay for items and some third-party services, as well as withdraw cash (Finscope, 2017).

2.11 Proposition Development 2

The introduction of digital product innovations could result in unintended consequences.

2.12 To explore the positive influence digital product innovations may have on the rural/low-income segment's customers

This section will explore the positive influence digital product innovations may have on the rural/low-income segment's customers. People are becoming a competitive and inimitable resource in the contemporary framework of the growth of high-tech businesses and development of the digital economy. The continuing digitalization processes has had an impact on people (Zaborovskaia et al., 2018).

According to Neog (2019), the development of technology is influencing the lives of low income and rural customers in many ways. The banking industry is a significant pillar of economic development. Digital transformation in the banking industry has enabled online channels to offer banking products and services in a suitable way.

According to Neog (2019), development and progression of technology has allowed customers to conduct financial transactions effortlessly by introducing several digital banking services and products. This enables the banking industry to offer services effortlessly and more efficiently. Digital banking facilities allow banks to offer elementary financial services and products to the financially excluded inhabitants predominantly in rural areas. Universally the banking industry drives digital financial facilities to encourage financial inclusion. Digital financial services offer efficient and simple means to conduct banking

transactions, and they can also serve as a system for gaining easy access to traditional banking services.

According to Kaur et al. (2020), the adoption and implementation of digital product innovations has given banks an added benefit of being able to offer a variety of products and services to their customers regardless of their income or location. By implementing and delivering products and services through digital channels, may have an influence by including segments of the public who have been previously excluded from the financial eco-system.

A study conducted by McKinsey Global Institute (MGI) “Digital finance for all: Powering inclusive growth in emerging economies”, see Box 1 and Figure 19 below, states that:

Two billion individuals and 200 million businesses in emerging economies today lack access to savings and credit, and even those with access can pay dearly for a limited range of products. Rapidly spreading digital technologies now offer an opportunity to provide financial services at much lower cost, and therefore profitably, boosting financial inclusion and enabling large productivity gains across the economy. While the benefits of digital finance—financial services delivered via mobile phones, the internet or cards, have been widely noted, in this report they wanted to quantify just how large the economic impact could be.

- Digital finance has the potential to provide access to financial services for 1.6 billion people in emerging economies, more than half of them women. It could increase the volume of loans extended to individuals and businesses by \$2.1 trillion and allow governments to save \$110 billion per year by reducing leakage in spending and tax revenue. Financial-services providers would benefit too, saving \$400 billion annually in direct costs while sustainably increasing their balance sheets by as much as \$4.2 trillion.
- Overall, the calculated that widespread use of digital finance could boost annual GDP of all emerging economies by \$3.7 trillion by 2025, a 6 percent increase versus a business-as-usual scenario. Nearly two-thirds of the increase would come from raised productivity of financial and non-financial businesses and governments as a result of digital payments. One-third would be from the additional investment that broader financial inclusion of people and micro, small, and medium-sized businesses would bring. The small remainder would come from time savings by individuals enabling more hours of work. This additional GDP could lead to the creation of up to 95 million jobs across all sectors.

- The potential economic impact varies significantly depending on a country's starting position. Field research was conducted in seven countries that span geographies and income levels: Brazil, China, Ethiopia, India, Mexico, Nigeria, and Pakistan. Lower-income countries such as Ethiopia, India, and Nigeria have the largest potential, with the opportunity to add 10 to 12 percent to their GDP, given low levels of financial inclusion and digital payments today. In comparison, middle-income countries such as China and Brazil could add 4 to 5 percent to GDP was is still a substantial boost.
- The rapid spread of mobile phones is the game changer that makes this opportunity possible. In 2014, nearly 80 percent of adults in emerging economies had a mobile phone, while only 55 percent had financial accounts—and mobile phone penetration is growing quickly. Mobile payments can lower the cost of providing financial services by 80 to 90 percent, enabling providers to serve lower income customers profitably. The data trail these technologies leave can enable lenders to assess the creditworthiness of borrowers and can help businesses better manage their finances.
- Businesses and government leaders will need to make a concerted effort to secure these potential benefits. Three building blocks are required: widespread mobile and digital infrastructure, a dynamic business environment for financial services, and digital finance products that meet the needs of individuals and small businesses in ways that are superior to the informal financial tools they use today.

Broadening access to finance through digital means can unlock productivity and investment, reduce poverty, empower women, and help build stronger institutions with less corruption—all while providing a profitable, sustainable business opportunity for financial service providers. The benefits for individuals, businesses, and governments can transform the economic prospects of emerging economies

Box 1: Digital finance for all (McKinsey Global Institute (MGI))

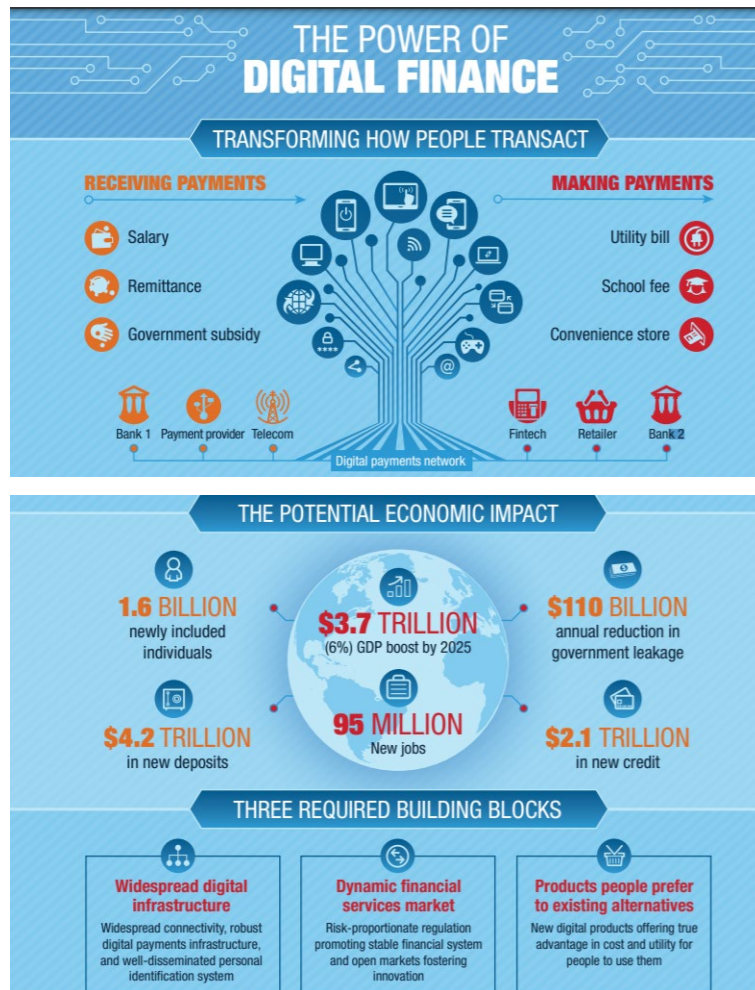


Figure 19: The Power of Digital Finance (McKinsey Global Institute (MGI))

According to Haider (2018), digital product innovations helped customers in the rural and low-income segments improve their livelihoods:

- *Poverty reduction: Digital product innovations pulled 2% of households out of extreme poverty, which was based on a survey of homes across developing countries.*
- *Weathering economic shocks: Digital product innovations make it easier to receive money from friends and family, by assisting consumers in weathering income shocks.*
- *Digital money transfers are rarely big enough to help with profit seeking and investing, but they do help strengthen maternal kinship bonds and relationships between siblings and cousins.*

Customers in the low-income and rural segments can now save and borrow through the formal financial system, allowing them to grow their account balances and assets while also profiting (Ouma et al., 2017; Wyman, 2017).

2.13 Proposition 3

Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater financial inclusion and the provision of a wide range of additional financial services

2.14 Conclusion of Literature Review

2.14.1 Proposition 1

Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.

2.14.2 Proposition 2

The introduction of digital product innovations could result in unintended consequences.

2.14.3 Proposition 3

Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater *financial inclusion and the provision of a wide range of additional financial services.

***Financial inclusion**

Financially inclusion and digital inclusion are not the same thing, but they are related. Clearly one of the objectives of digital transformation of the banks is to increase financial inclusion. So therefore it is an unavoidable construct.

RO #	State Research Objective	Prop #	State Proposition
1	Exploring the influence of digital transformation on low-income, rural customers in the large South African Banks		
1.1.	To explore whether digital product innovations introduced by banks are achieving the desired results	1	Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.
1.2	To explore whether the introduction of digital product innovations drives any unintended consequences	2	The introduction of digital product innovations could result in unintended consequences.
1.3.	To explore the positive influence digital product innovations may have on the rural/low-income segment's customers	3	Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater financial inclusion and the provision of a wide range of additional financial services

Table 6: Consistency table: research questions and propositions

2.15. Conceptual Research Framework

The conceptual research framework provides guidance on what model the study will be exploring. The researcher coupled the Digital Divide framework with the Technology Acceptance Model (TAM) published by (Davis et al., 1989), which is an information systems model used to explain or forecast consumers' motives to embrace and use a technology. TAM is one of the most widely used models for determining the adoption of Information Systems/Information Technology (IT/IS).

This paradigm, which has been empirically demonstrated to have excellent validity, has been used and expanded in many earlier investigations. Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) are significant criteria that determine acceptability of specific technologies, according to the model. The digital divide framework and its elements: impaired levels of access and usage, the study explored:

- 1) Banks are introducing digital product innovations as part of their digital transformation journey; are these innovations being accepted by customers in the rural and low income segment, do customers in the rural and low income segments find it useful and easy to use ; how does;
- 2) The digital divide which speaks to impaired levels of access and usage, influence
- 3) The Nature and Extent of: Adoption of these digital product innovations by rural and lower income segment customers.

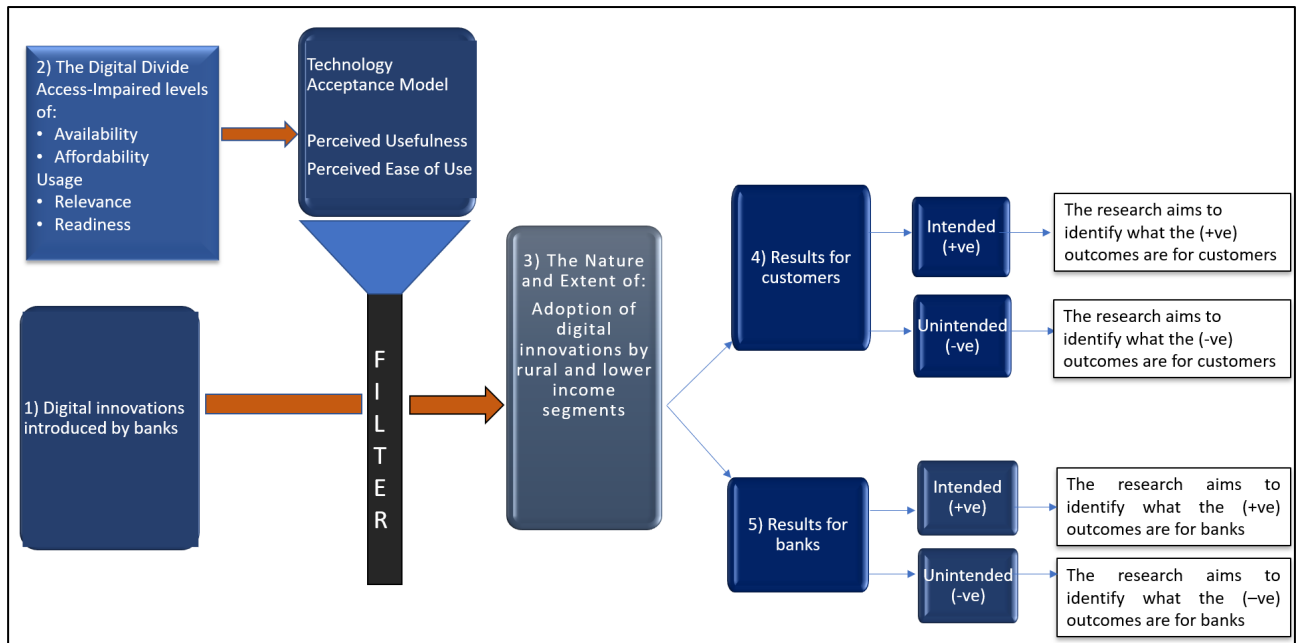


Figure 20: Conceptual Framework

Figure 20 depicts what the study will be exploring in terms of the five elements listed:

1. What digital product innovations are being introduced by banks in their digital transformation journey?
2. The Digital Divide: how does the digital divide influence the acceptance of these digital product innovations introduced by the bank through the lens of the TAM? The filter illustrates the barriers or acceptance of digital product innovations.
3. What is the nature and extent of digital adoption by rural and lower income segment customers?
4. What are the positive and negative outcomes for customers?
5. What are the positive and negative outcomes for banks?

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Research approach

The qualitative research method was chosen because it fortifies the awareness and explanation of the context of the study allowing the researcher to create enthusiasm during interactions with participants.

3.1.1 Inductive Reasoning

Inductive reasoning permits the researcher to utilise current knowns to infer broader understandings and theories from specific observations and individual occurrences (Modiba, 2020). This method depends on suggestions obtained from the gathering of the qualitative data collected. Inductive reasoning is a method of coherent thinking that utilizes observations with empirical evidence to reach a conclusion. When the researcher analyzes a data set and can process general conclusions founded on existing information, inductive reasoning is utilized (Indeed, 2021).

3.1.2 Justification for Interpretivist Inductive Reasoning

Even though current concepts were supporting the research, it was inductive opposed to deductive. The concepts utilized provided a view as to what concepts would be studied rather than testing the model concepts, deductively. By utilizing the inductive approach, the awareness was to assign meaning to the fundamentals on the data which was be obtained during interviews.

3.2. Justification for using Qualitative Research approach

Rahman (2016), defines the term 'qualitative research', as research that reflects results by not using statistical methods or further avenues of quantification. The research could include aspects about individuals' livelihoods, understandings, behaviours, sentiments, and state of mind, including business operations and societal activities. Researchers can create an all-encompassing portrayal of challenges using the qualitative research approach (Modiba, 2020).

This study adopted the qualitative approach and provided concepts for the study's topic (Modiba, 2020):

- *It is all-inclusive, scrutinizing the greater image and initiates by observing for an understanding.*
- *Researchers will be the research tool.*
- *It involves familiar judgments on consent and responds to ethical apprehensions.*

Carol (2021), goes on to state qualitative research works and excellent results are produced:

- *Participants are more involved as inactive methods such as interviews and group discussions are utilized.*
- *The chance to probe allows the researcher to gather further insights rather than close ended initial responses and rationales.*
- *It also aids in preventing the uncomfortableness that leads to thoughtless responses and replies.*

The qualitative research method was chosen for this study, the resolve was to explore “The influence of digital transformation on low-income, rural customers in the large South African Banks”.

The researcher made sure that her personal experiences were not discussed and that she remained objective. The study was exploratory in nature, with the goal of providing an independent understanding of the topic.

3.3 Research Design

Elkatawneh (2016), a “case study” is defined as “an event, problem, process, activity, a single person, or the actions of a group of people.” The bounded system will be used in the case study, usually depicted by time or space. The case study is embodied by several data sources, such as interviews, observations, articles just a name a few. To obtain a thorough understanding of the case, various data

sources will need to be explored. The case study research design consists of three elements (Elkatawneh, 2016):

- *A single instrument case study, here the focus is on an issue and a bounded case is selected to explain that issue.*
- *A multiple instrument case study, here the focus is on an issue and numerous bounded cases are used to explain that issue.*
- *An intrinsic case study, the focus is on the case itself, prior to delving into the issue. The researcher will select an exclusive or unfamiliar case and conducts their study.*

The researcher will conduct an analysis of the data post collection, based upon the case study research type selected. Should the researcher select the single instrumental case study, the researcher would analyse all forms of information and generate themes. Should the multiple case study type be used, the researcher analysis all the forms of data and generate themes found in each case, a cross-case analysis will be done (Patton, 2015).

The multiple case study approach was used for this research study. The reason for selecting the qualitative multiple case study research design, permits for a broader learning of theoretic progress and research questions (Gustafsson, 2017). Crowe, et al. (2011), acknowledges that this research design allows for exhaustive, multi-faceted studies of complex matters in real-life settings. The worth of the case study approach is commonly used in the fields of business, law, and policy. A case study can be used to investigate a single individual, a group of people, or an institution, (In this study, the banking industry and its rural and low-income segment customers are examined) (Modiba, 2020).

The constraint of the case study research design is: 1) in the struggle of defining the case, that is to discover a problem and then explore the case to explain, or to study the case itself, 2) trying to establish if one or multiple cases should be explored, 3) defining the boundaries of the case could become a problem, 4) exploring multiple cases could create less detail for each case (Patton, 2015).

Data collection methods: Three extensive groups of data gathering exists inside of qualitative research: observations; interviews; and the use of existing research material (Gill et al., 2008). Interviews was the primary method of data gathering for this study. Primary data was gathered via semi-structured interviews through purposefully selecting individuals from the banking industry.

The researcher utilized Microsoft Teams to conduct semi-structured interviews that lasted anything from 30 to 60 minutes. The interviews were done with subject matter experts who are involved in strategic decisions as well as the day-to-day operations and management of their business units, which include delivering digital solutions to customers in rural and low-income segments.

3.3.1 Justification for Semi Structured Interviews

The semi-structured interview method is simple to comprehend, challenges experienced from the perspective of the participants in the study. Table 4 shows an overview of some of the interview questions that will be asked during the interviews.

The researcher will be able to ascertain and gather an in-depth understanding of the participants viewpoints by means of communication in interviewing as a method of data collection (Busetto et al., 2020). Qualitative research design using semi-structured interviews allows for an agile structure, such that the design can be created or recreated to a greater extent (Maxwell, 2012). An exhaustive and apt study of information can be conducted by utilising qualitative research methods, with participants having the flexibility to determine what is constant for them (Flick, 2011), with complicated matters easily understood.

3.4 Population and Sample

This section explains how the research will be conducted. It specifies the unit of analysis, population, sampling, and data collection methods.

3.4.1 Unit of Analysis

Trochim (2006), defines the unit of analysis as the initial phase in determining how you will analyse data. It is “who” or “what” that the researcher will be analysing in the study. This could be a person, people, or an industry. The unit of analysis was conducted on the South African Banking Industry i.e., the large South African Banks.

3.4.2 Population

The South African traditional retail banking industry was identified as the population for this study. This research study focused on the big five traditional retail banks in South Africa and did not look at digital banks in South Africa who do not really feature in the low-income and rural segment space.

Shukla (2020), defines population as a set or collection of all the elements on which the results of the research are to be applied. He further goes on to explain the meaning of a population consists of all the elements on which the results of research can be applied. meaning the population is a set of all the elements which have flexible distinguishing traits under study, and for which results of research can be generalised.

3.4.3 Sample and sampling method

A key component of the qualitative research process is defining and selecting a suitable sample from the population with the intent of the study being aptly explored. The sample selection process in qualitative research, is imperative since unsuitable measures may severely impact the results and conclusions of the study (Lopez & Whitehead, 2013).

3.4.3.1 Sampling method

Non-probability sampling is utilised in qualitative research and probability sampling is utilised in quantitative research, allowing the researcher to select the sample with attributes that epitomize a broader area. In qualitative research, by

utilising non-probability sampling the researchers select explicit samples to explore an explicit. Non-probability sampling is made up of (Modiba, 2020):

- *convenience sampling*
- *purposive sampling*
- *snowball sampling*
- *theoretical sampling*

For this study the researcher used purposive sampling. Purposive or Judgmental Sample: Purposive sampling is an adequate method of sampling for singular situations. It selects instances with the help of a subject matter expert, or it selects cases with a specific goal in mind. Purposive sampling is utilised most frequently when an unreachable population needs to be measured (Modiba & Kekwaletswe, 2020).

Key stakeholders who are subject matter experts on the topic from the banking industry were purposefully selected and interviewed. This follows Ritchie et al. (2013) guidance that the interview guide would include individual interviews with less than 50 qualitative samples.

Profile of participants are depicted below in table 7:

Institution	Number of Interviewees
Bank A	4
Bank B	4
Bank C	2
Bank D	2
Bank E	1

Table 7: Profile of participants

3.5 The Research Instrument

EditageInsights (2020), describes a research instrument that is used to collect, measure, and scrutinize data from participants on a certain research topic. The researcher selects the instrument to utilize constructed on the kind of study the researcher will be conducting be it quantitative, qualitative, or mixed method. For a qualitative study one can use an interview guide.

According to Schindler (2019), the researcher will interview participants and collect responses via personal or impersonal approaches in a communication study. Data can be obtained using one of the following research instruments: (1) interviews, telephone conversations, or web discussions; (2) self-administered or self-reported instruments sent through the mail or communicated electronically or through other means. The term "conversation" is employed because, as opposed to employing a survey, getting data through inquiry entails more probing.

The research instrument selected for this study was the interview guide. Phillips (2016), describes an 'interview' as commonly a direct discussion among the interviewer and interviewee resulting in a transference of data to the interviewer. Creswell (2012), in his study states that the research instrument employed in qualitative research is the interview guide and becomes apparent when the researcher will ask one or more participants general, open-ended questions and scribe the replies.

Strengths of Interviews (Creswell, 2012):

- *Interviews deliver valuable data when participants are not able to be directly observed.*
- *It provides the ability for the interviewer to better facilitate and control the information that they would receive as they select the questions to be asked.*
- *If worded well, it will reassure unprejudiced and honest answers.*

Weaknesses of Interviews (Creswell, 2012):

- *The interviewee could provide subjective information.*

- *The responses may be misleading because the interviewee could respond in a manner that might satisfy the interviewer.*
- *Can be long and inexperienced interviewers stand the risk of not phrasing the questions properly.*

3.6 Technique for data collection

For this study, the data collection technique employed was, semi-structured interviews conducted via Microsoft teams with the selected participants. The researcher purposefully selected participants who have the relevant skills, knowledge, and experience regarding the topic. The participants are, Heads of business units and Senior Managers from the banking industry who have pertinent knowledge and information on the influence of digital transformation on low-income and rural segment customers. The researcher selected participants who are able to contribute to the research matter.

- *Once research ethics clearance was received from Wits Business School the researcher contacted the selected participants to set up the interviews.*
- *The appointments were scheduled via Microsoft teams. Due to the current covid-19 pandemic face to face meetings were not advised.*
- *Semi-structured interviews were conducted and recorded.*

3.7 Data analysis and interpretation

Cleaning, converting, and modelling data to provide relevant evidence for decision-making is the process of data analysis. The purpose of data analysis is to extract valuable evidence from data and develop conclusions based on it (Nowell et al., 2017).

As qualitative research develops progressively familiar and creates value, it is therefore crucial it is applied in a logical way so that meaningful and beneficial results are produced. In order for the data to be considered as reliable, qualitative researchers need to prove the analysis of the data has been conducted in an accurate, dependable, and thorough means via recording, as well as ensuring

that the process of analysis is being disclosed and adequate detail is included allowing the person who reads, the ability to determine if the process applied is reliable (Nowell et al., 2017).

The participants in this study provided their perspectives and inputs on the banking sector's digital transformation journey and its influence on rural and low-income consumers. Thematic and content analysis are used in inductive studies, which is commonly utilized in interview transcripts (Caulfield, 2020). The researcher meticulously inspected the data gathered to recognize shared concepts of importance that originated regularly. In qualitative data analysis, thematic analysis is a common method that focuses on the investigation and capturing shared concepts in the data (Guest et al., 2014). The data obtained for this qualitative study was analysed using thematic analysis.

Advantages of Thematic Analysis (Nowell et al., 2017):

- It provides an elastic way that can be altered for the requirements of various studies offering an enriched comprehensive set of data outcomes.
- Does not demand a complete theoretical and technological knowledge like other methods, it allows additional forms of analysis
- Is simple to comprehend and could be easy to study, due to the limited prescriptions and procedures.
- Thematic analysis is a valuable technique for probing the viewpoints of diverse research participants, highlighting similarities and differences, and producing unlooked-for views and insights.
- A key benefit of utilising thematic analysis allows the researcher to summarise significant themes from the data and use a methodical approach to produce an understandable report.

Thematic analysis has numerous advantages; however, it is significant to recognise the disadvantages of this technique. Disadvantages of Thematic Analysis (Nowell et al., 2017):

- The absence of extensive studies on thematic analysis relative to that of the other methods, may result in beginner researchers to experience uncertainty on produce a robust analysis.
- The elasticity could create a variation and an absence of consistency when creating concepts from the data collected.
- Reliability as well as solidity can be endorsed by ensuring a clear degree of its validation that could articulately reinforce the research outcomes.

3.8 Limitations of the study

- Data inaccuracy can prevail owing to participants who are bank employees, being bias in favour of the bank.
- Misinterpretation of interview questions can occur and could lead to the data gathered being compromised and inaccurate analysis conducted.
- A key constraint of this study is that there are insufficient studies conducted in South Africa regarding the influence of digital transformation on low-income, rural customers in the large South African Banks
- The views and insights of the rural and low-income customers were not factored into this study.

3.9 Transferability and Dependability

In qualitative research transferability is the same as external validity, in quantitative research (Trochim, n.d.). This is gained by offering readers evidence that the conclusion from the study is potentially relevant to other cases. Transferability in qualitative research is well-defined in that the outcomes from the research could be used or transferred outside the boundaries of this project. Transferability infers those outcomes from the research study could be relevant to parallel conditions or persons (Universalteacher, n.d.).

3.9.1 Transferability

This study used the (Modiba & Kekwaletswe, 2020), transferability approach, with population, data collection, and sample serving as transferability subjects. The

qualitative researcher boosted transferability by going into great detail about the context and expectation of the research (Ness, 2020).

A person who desires to "transfer" the findings of this study to be used in a new situation is responsible for making that decision as well as ensuring the feasibility of the transfer. The findings of this study will be transferable and beneficial to the South African banking industry, allowing key players to make critical strategic decisions about their rural and low-income segment customers.

3.9.2 Credibility

Credibility is similar to internal validity, in quantitative studies, ensuring that the outcomes are reliable (Chowdhury, 2015). A prescribed interpretation could potentially be considered through triangulation of the research instruments (Shenton, 2004). This study ensured credibility by following the set criteria and strategies (Noble & Smith, 2015), to promise and augment the credibility of the proposal and execution of study, researchers could contemplate methods such as data triangulation. Interviews were conducted to gather information and data. The use of triangulation of different frameworks or related models, as well as the triangulation of the various data sets, will improve the study's credibility.

3.9.3 Dependability

In addressing the matter of dependability, the positivist adopts methods to demonstrate that, if the study is recurring, in an identical setting, with identical methods and with the same participants, comparable results would be attained (Shenton, 2004). Chowdhury (2015), clarifies that it is the adoption of "overlapping methods"; and exhaustive procedural explanations that permit the study to be repeated.

Using the multi case-study method, the study followed a rigorous research procedure, explaining the inductive approach and providing a full background for the research. The study was carried out in a professional manner, led by the

(Noble & Smith, 2015), framework, which established an accurate and reliable aspect of the research technique used.

The researcher made sure the participants were experts in their individual banks' digital transformation journeys in order to ensure dependability was applied to this research study. Additionally, they worked on developing digital product innovations for the banks' low-income and rural customers. Detailed notes were taken during all the interview sessions. The data was reduced into themes by a process of making quotations, coding, and condensing the codes.

3.10 Demographic profile of respondents

Participants were chosen for this study based on their respective employment roles that were relevant to the study.

3.11 Ethical considerations

Resnik (2015), states that moralities such as honesty, objectivity, integrity, openness, social responsibility, non-discrimination, and confidentiality are vital principles in research to guarantee that the research is conducted ethically. The foundations of this research project were built on gathering and evaluating the data gathered, assuring accurate analysis and recommendations without jeopardizing participant confidentiality, and freely sharing the outcomes of this research study. Numerous universities have also established guidelines for conducting ethical research (Polonski, 2004).

- *This research study's honesty and integrity relates to the researcher's work, in which all literature review, interpretation, data collection, and recommendations are the researcher's own work, as evidenced by the use of the Turnitin plagiarism detection tool.*
- *Subjectivity of this research study was achieved using the Atlas.ti 9 qualitative analysis tool to ensure the data is not skewed to drive a specific narrative (Buchanan et al., 1998).*

- *The integrity and openness of this research study adhered to the instrument tool used to collect the data; the research data will be made available to any participant who requests for the results of this study.*
- *Finally, the confidentiality of this research study was maintained by the selection of the research instrument used to collect data, and the data acquired for this research study is saved on a password-protected private computer.*

This research report adhered to the ethical guidelines as set out by the University of the Witwatersrand to ensure that the researcher complies with the rigorous ethical requirements as set out by the university.

Roets (2017), summaries the importance of protecting participants privacy and confidentiality in research study. The University of the Witwatersrand (Wits Business School), Faculty of Economics and Management has a research ethics committee to ensure that ethical standards are met and followed during a study. Prior to data collection, the ethics committee granted approval. There were extensive ethical discussions to ensure that the study was carried out properly (Resnik, 2015). The study followed and abided by the ethical guidelines set out below:

3.11.1 Informed Consent

Participants will be given a verbal consent or a consent form for interviews and participation in the study to comply with ethical guidelines when interviewing them (Polonski, 2004). Fouka & Mantzorou (2011), positions that informed consent relates to the participant willingly, logically, in a lucid manner and evident manner, provides their consent.

The participants provided their written consent for this study. The study's purpose was described to the participants, and they were told that if they didn't want to continue, they could terminate the interview at any time. The participants were asked if they were okay with the interviews being recorded. Some of the interviewees agreed to have their interviews recorded and were informed that the

conversations would be transcribed. Extensive notes were transcribed for those who did not agree to the recording.

3.11.2 Privacy and Confidentiality

Participants were told that their information would be kept private and confidential, with the exception of the material from each interview, which was shared with the study supervisor. The supervisor has never met the participants and has never communicated with them in any manner. The participants' actual names, as well as the names of the major South African banks, were not revealed in this study; instead, pseudonyms were used. Participants' personal and sensitive information, such as their names and any other demographic data that could lead to their identification, was kept private and confidential throughout the study. The identities of the participants were kept fully hidden.

Because the interviews were private, the researcher highlighted to the participants the need of maintaining confidentiality in order to preserve their trust. Participants were willing to contribute their views, opinions, and experiences as long as they remained anonymous.

3.11.3 Protection against any harm

The researcher ensured that all risks and predictable harm was minimized, be it physical or social harms and risks levied on participants. Participants were asked to highlight any problems that the researcher may be unaware of that could cause unintended harm, such as existing emotional conditions.

3.11.4 Reflect on Interviews

The researcher and the participant discussed the interviews after they were completed to assess if the stated objectives were met. This revealed that the interview had no negative or distressing effects on the participants.

3.12 Summary of Chapter 3

This chapter examined the research methodologies that were employed to achieve the study's objectives. As part of the explanation and description of research processes, paradigms, time horizons, research strategy, research design, research approach, data analysis, research rigor or research validation, ethics, ontology, and epistemology were examined and justified.

RO #	State Research Objective	Prop#	State Proposition	Data collection detail	Data analysis method
1	Exploring the influence of digital transformation on low-income, rural customers in the large South African Banks				
1.1	To explore whether digital product innovations introduced by banks is achieving the desired results	1	Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.	Interview guide questions 1-7	Thematic analysis
1.2	To explore whether the introduction of digital product innovations drives any unintended results	2	The introduction of digital product innovations could result in unintended consequences.	Interview guide questions 11,12,15,16	Thematic analysis
1.3	To explore the positive influence digital product innovations may have on the rural/low-income segment's customers	3	Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater financial inclusion and the provision of a wide range of additional financial services	Interview guide questions 13,14,17,18,19,20	Thematic analysis

Table 8: Consistency table: research questions, propositions, data collection and data analysis

CHAPTER 4. PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the findings obtained from the data collected through the qualitative research interview guide by using the thematic analysis process described below. The data was reduced into themes by a process of making quotations, coding, and condensing the codes, and then the findings were presented (Figure 21).

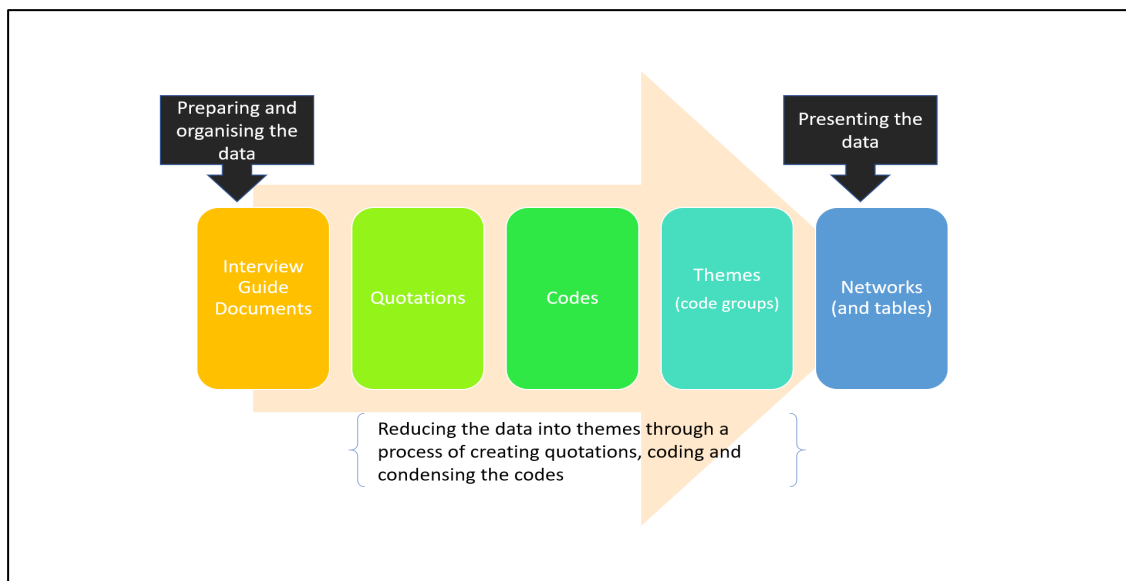


Figure 21: Process used to present findings

A total of 13 participants from the large South African banks were interviewed via Microsoft Teams. This allowed for the development of a unique collection of viewpoints on the influence of digital transformation on low-income, rural customers in the large South African banks.

The majority of the interviews lasted an average of 45 to 60 minutes. The interviews were conducted entirely in English. Because the majority of the participants were apprehensive about being recorded during the interview, extensive notes were taken to document their responses. The interviews were semi-structured, with a variety of other related questions thrown in for good

measure. This allowed for maximum flexibility and insight. The interview material was analyzed using the qualitative thematic analysis technique. Using Atlas.ti 9 software, a variety of replies were categorized into six key themes based on data reduction, display, and conclusion-drawing methods.

4.2 Background information on the participants

A total of 13 subject matter experts on the topic of digital transformation from the large 5 banks in South Africa, were purposefully selected and interviewed. All the participants work in the banking industry, developing and implementing digital transformation initiatives and strategies for low-income and rural segment customers. Table 9 below shows the sample breakdown of the number of participants interviewed from each bank:

Institution	Number of Interviewees
Bank A	4
Bank B	4
Bank C	2
Bank D	2
Bank E	1

Table 9: Sample of participants

The researcher had to gain an understanding of the below points to answer the objectives of the research study:

- 1) What digital transformation innovations are the large South African banks introducing in terms of product and customer engagement;*
- 2) What activities can customers perform using these digital product innovations;*

3) To what extent do these digital product innovations apply to the low-income and rural segment customers;

4) What is the intention of these digital product innovations?

Once this information was obtained the researcher was then able to address research objectives 1-3. These findings have been included and incorporated into the emergent themes, allowing the researcher to fully present the findings to properly articulate the research objectives tying it back to the conceptual framework below.

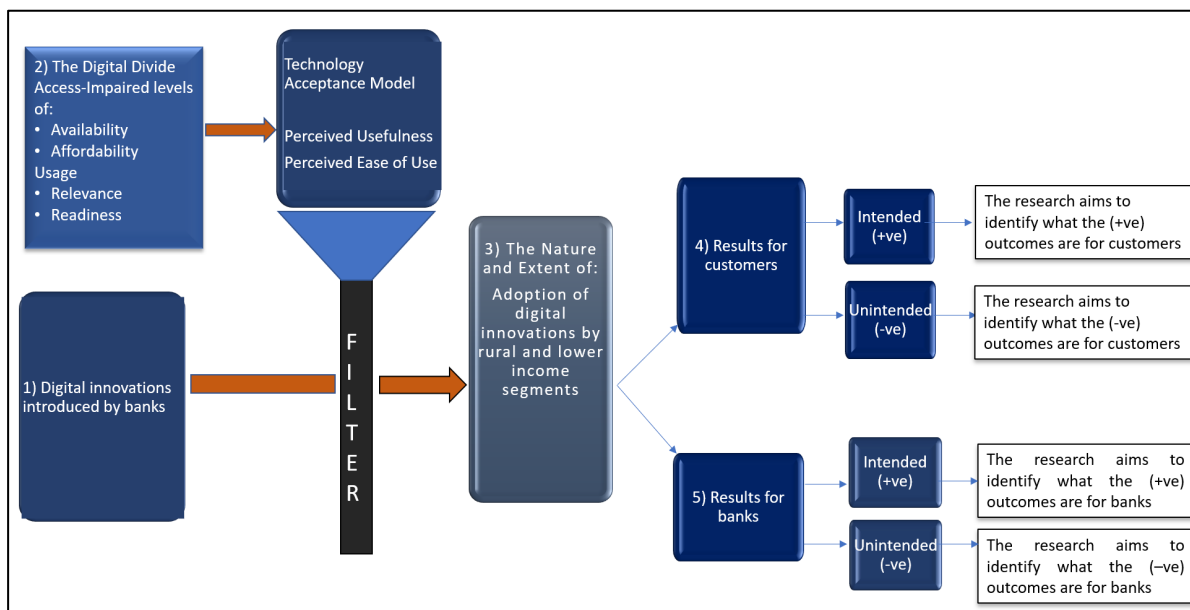


Figure 22: Conceptual Framework

Figure 22 depicts what the study explored in terms of the five elements listed:

1. What digital product innovations are being introduced by banks in their digital transformation journey?
2. The Digital Divide: how does the digital divide influence the acceptance of these digital product innovations introduced by the bank through the lens of the TAM? The filter illustrates the barriers for acceptance of digital product innovations.
3. What is the nature and extent of digital adoption by rural and lower income segment customers?

4. What are the positive and negative outcomes for customers?
5. What are the positive and negative outcomes for banks?

4.3 Emergent Themes

During the interviews, a variety of responses were gathered and categorized into six key themes, which will now be presented.

4.3.1 Digital product innovations

This theme explores and presents the digital product innovations introduced by the large South African Banks. This is one of the themes that will assist us in answering proposition 1.

The interview question below was posed to participants.

What digital product innovations has your bank introduced in terms of a) product; and b) customer engagement and experience?

All the participants were aware and knowledgeable of the digital product innovations their banks have introduced in terms of product, customer engagement and experience, and the extent that these apply to the rural and lower-income segment clients.

It was very interesting to note that some participants advised that the bank does not make any differentiation of these digital product innovations amongst their different segments of customers.

Another participant advised that the bank has created and developed enhanced capabilities and functionality on the USSD/Cellphone banking platform to cater for the rural and low-income segment customers.

One participant mentioned that they have created a mobile app light version that does not require a lot of space when downloaded which works on almost all smartphones, for the rural and low-income segment customers.

4.3.2 Intention of digital product innovations

This theme explores what is the intention of the banks by introducing digital product innovations. This theme will assist us in answering proposition 1. Participants were asked the following interview question.

What is the intention of these digital product innovations?

The participants were confident in their answers and their understanding of the intent of the digital product innovations that the banks were implementing as part of their digital transformation journey. They expressed views on the intent from both a business and a customer viewpoint in a variety of ways.

4.3.3 Are these digital product innovations achieving the desired results

This theme explores if the desired results are being achieved that was discussed in section 4.3.2. This theme will assist us in answering proposition 1. Participants were asked the following interview question.

Are these digital product innovations achieving the desired results?

The participants offered their views liberally and some of these views touched on their interpretation or encounter with current experiences. All of the participants agreed that the desired results had been achieved from the bank's perspective; however, some participants strongly expressed that the desired results had not been achieved from the customer's perspective, particularly for rural and low-income customers, due to several barriers to technology adoption that these customers face. This then speaks to the next emergent theme the digital divide.

4.3.4 The nature and extent of digital adoption

This theme explores whether customers in low-income and rural segments adopt and use digital products and services. The following interview question was posed to participants.

What is the adoption/acceptance, activation and usage levels of digital products and services by customers in the lower income and rural segment?

The findings varied across the banks, while some banks have a somewhat great adoption and usage rate others have not shared the same success.

4.3.5 The Digital Divide

This theme explores how the digital divide influences the acceptance and usage of the digital product innovations introduced by banks. This theme will assist us in answering proposition 1.

It is worth noting that no direct questions about the digital divide were asked of the participants during the interview. However, all of the participants agreed that low-income and rural segment customers experience a multitude of barriers to digital product innovation adoption, which is largely due to components of the digital divide.

4.3.6 Implications of digital product innovations

This theme explores the implications of digital product innovations; further broken down below into whether it drives any unintended negative results as well as the intended positive results, answering propositions 2 and 3.

4.3.6.1 Unintended negative results

This theme explores the ramifications of digital product innovations to see if they have any unintended negative consequences, addressing proposition 2. The following question was asked.

Are these digital product innovations driving any unintended results in the rural and lower-income segment? If yes, what is your organisation doing to ensure that this segment of customers is digitally included in the organisation's solutions?

50% of the participants agree that these digital product innovations are in fact driving unintended results. 2 of the participants advised that customers

perception is that Bank A is a rich man's bank. 1 of the participants advised that it is a great imposition on this segment of customers. Another participant stated that is driving forced compliance, whereby bankers register customers on these digital channels and customers still come back into branch for services.

The other 50% of the participants state that these digital product innovations are not driving unintended results and are welcomed by this segment of customers.

Has there been customer resentment by implementing digital services or products?

The participants were divided on whether these digital services and products were causing animosity. Because the elderly population of customers is not digitally literate, the majority of the participants believed that it has produced discontent among them. However, all the participants agreed that improving communication, awareness, education, and training with clients at the branch is a critical step in reversing present patterns.

According to the participants customers are also reluctant to use digital products, for a variety of reasons, including their safety, fear of being hacked, and a language barrier, as digital platforms are now only available in English and Afrikaans.

4.3.6.2 Intended positive results

This theme explores the implications of digital product innovations to understand the positive intended results, answering propositions 3. The following questions was posed to the participants:

What influence does digital transformation have on the rural and low-income segment's customers?

Majority of the participants stated that digital transformation has had a positive influence for this segment of customers, with a major finding being that it drives financial inclusion.

How have customers in this segment benefited from the implementation of digital solutions?

All the participants agree that customers in this segment have benefited from the implementation of these digital solutions.

Are these digital solutions welcomed by customers in this segment?

The participants state that once awareness, education, and training has been provided then yes, it is welcomed.

Do customers in this segment find these digital solutions useful?

All the participants agree that the customers in this segment who adopt and utilise these digital solutions find it useful.

Do customers in this segment find it easy to use these digital solutions?

All the participants advised initially the customers do not find it easy to use. Once they have been trained and shown how to use these solutions then yes, they find it easy to use.

Is customer lifetime value enhanced by introducing digital solutions in this segment?

According to some participants, only fully digitally entrenched customers' lifetime value is enhanced. A participant stated that these digital solutions unlock more opportunities for customers.

4.4 Linking themes to the propositions of the study

4.4.1 Themes related to proposition 1

Proposition 1: Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.

Interview questions 1-7 and 11 was posed to the participants to understand if they were aware of the digital product innovations being introduced by their banks and what are some of the services or functions customers could perform using digital channels, the researcher then asked them to what extent did these digital product innovations apply to the rural and low-income segment customers.

It was imperative to understand the intention behind the introduction of these digital product innovations and if the desired outcomes were being realised. Finally, the researcher asked the participants what is the adoption/acceptance, activation and usage levels of digital products and services by customers in the lower income and rural segment?

4.4.1.1 Digital product innovations

Figure 23, which pertains to point one on the conceptual framework, explores and shows the digital product innovations introduced by the large five South African banks, based on the responses of the participants.

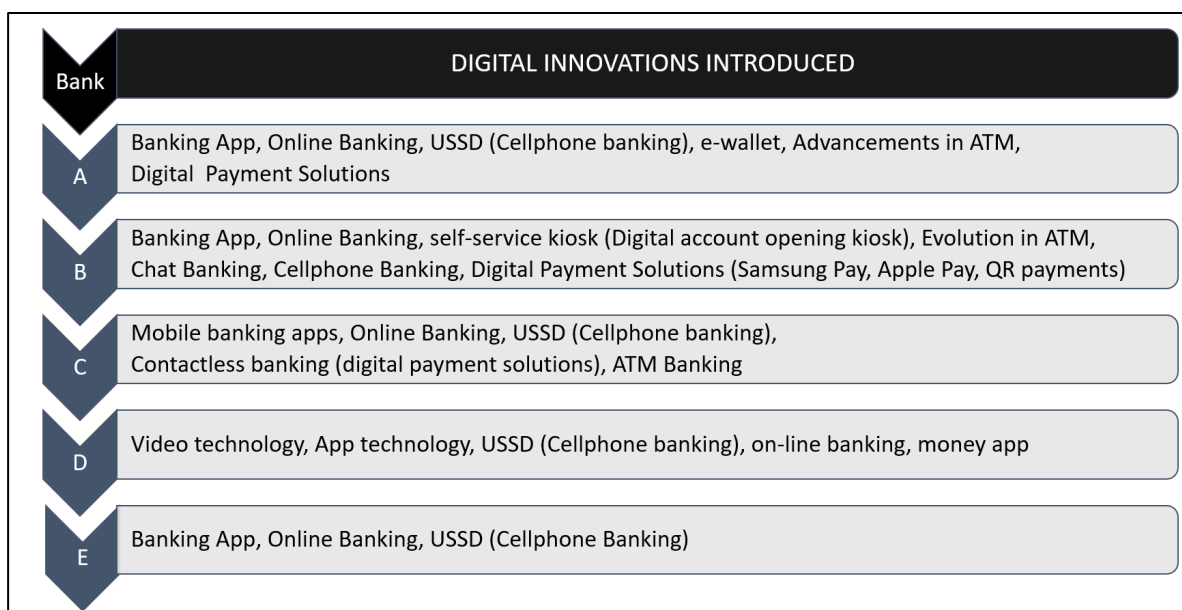


Figure 23: Digital product innovations introduced by banks

All five of the major banks are implementing digital product innovations, according to the findings. Despite the introduction of digital product innovations, not all of a particular bank's products are available on digital platforms.

Participant 1 from Bank B; stated that *“unfortunately not all of the bank’s products are available on their Digital platforms for Digital end to end processing like their Credit Card product & Flexi Transactional account”*.

Bank B's self-service digital account opening kiosk innovation is a game changer for both the bank and consumers. This links in neatly with objective 1, demonstrating that the desired outcomes with the introduction of digital product innovation are being realized by giving cost savings and convenience to clients, as well as lowering expenses for the bank and attracting new customers, resulting in increased market share.

Participant 2 from Bank B: *“The self-service digital account opening kiosk is first of its kind for Bank B and enables the digital on-boarding a client who is new to the bank, targeting LSM 1-7 customers. The intent is for the client to open the account on their own. To do outside of traditional banking hours. In branch this account will take a consultant an hour to open. With this innovation it takes approximately 4.5 mins”*.

Bank D also introduced a remarkable digital product innovation that allows customers to withdraw cash from an ATM without using their card, according to the findings. This clearly demonstrates an intent of the bank by introducing digital product innovations, which provides customers with a quick, simple, and secure method of withdrawing funds.

Participant 2 from Bank D: *“Money App: It's quick, simple, and secure. To make a withdrawal, simply use your Money app instead of your bank card. To set up an ATM withdrawal with a unique QR code, log into the Money app and select Get cash to select your account and enter the amount you require”*.

According to the findings, Bank E is providing digital product innovations that demonstrate its commitment to becoming a customer-centric bank. They develop innovations that fulfil customer needs and are well-received by customers in the low-income and rural segments.

Participant from Bank E: *“ the bank doesn’t really push the innovation narrative but what they have done is create an app that is accepted by a base that traditionally didn’t accept technology that easily. That I would say is the biggest innovation they created. The app allows the customer the ability to do most of their banking on the app like other banks but without all the technicalities. The experience helps build confidence and this improves adoption. Branch bankers also work extensively with customers if they do visit the branch to show them how easy it is to use the app which inspires confidence”*.

4.4.1.2 Intention of digital product innovations

This theme explores what is the intention of banks, by introducing digital product innovations. The study's coding criteria and theme identification method are depicted in Table 10.

18 codes were identified, and colour coded and categorised into 7 themes. 8 of the 18 codes identified, spoke to customer experience and these codes come up 30 times across all bank participants. To increase existing product use and take-up, 1 code was identified and was mentioned once by 1 participant in Bank A. 3 of the codes spoke to increase market share and was mentioned by 12 participants from 4 of the big 5 banks. De-cashing the economy fits into the financially empower customers theme and was mentioned twice from participants in Bank A. 1 code was recognised that spoke to the create trust and security around digital banking and was mentioned twice by participants from Bank A. Create process and operational efficiencies, 1 code was identified and was mentioned thrice by 1 participant in Bank A and 2 participants from Bank D. 3 codes were identified under the theme increase profit before tax and was mentioned 8 times by participants from Banks A, B and E.

	Bank A	Bank B	Bank C	Bank D	Bank E	Totals	Themes
A better customer experience Gr=3	1	1	0	1	0	3	Improve, enhance customer engagement and experience
Ability to understand customer behaviour from enhanced data collection Gr=3	2	1	0	0	0	3	To increase existing customer product use and take-up
Attract new customers Gr=3	0	1	2	0	0	3	Increase market share and growth
Be more customer centric Gr=3	2	0	0	1	0	3	Financially empower customers
Compete better in an economic environment Gr=4	2	0	1	1	0	4	Create trust and security around digital banking
Cost reduction for customers Gr=6	3	0	0	2	1	6	Create process and operational efficiencies
Increase customer VSI Gr=1	1	0	0	0	0	1	Increase profit before tax
Customer: Self service Gr=4	3	0	1	0	0	4	
De-cashing the economy Gr=2	2	0	0	0	0	2	
Develop products more suited to this segment Gr=1	1	0	0	0	0	1	
Drive digital adoption Gr=2	2	0	0	0	0	2	
Increase market-share Gr=5	1	2	1	1	0	5	
Increased security Gr=2	2	0	0	0	0	2	
Reduce traffic in branch Gr=3	2	0	0	0	1	3	
Reduced customer attrition Gr=3	3	0	0	0	0	3	
Revenue growth Gr=2	1	1	0	0	0	2	
Simplify banking Gr=8	2	1	3	1	1	8	
Streamline processes and improve efficiencies Gr=3	1	0	0	2	0	3	

Table 10: Intention of digital product innovations

4.4.1.3 Are these digital product innovations achieving the desired results

The themes evaluated whether the banks' desired outcomes are being fulfilled as a result of the introduction of digital product innovations, as shown in Tables 11 and 12. According to the participants, the introduction of digital product innovations is both attaining and not obtaining the desirable results anticipated by banks.

Table 11 speaks to banks achieving the desired results. 19 codes originated from the findings, which were color-coded and categorized into 6 themes. The digital adoption and profit realisation for banks themes share majority of the codes totalling 10 out of the 19 codes identified, with codes for digital adoption being mentioned 10 times by participants across 4 banks and codes for profit realisation being mentioned 6 times by participants from Bank A, B and E. Interesting to note on these 2 themes there was no input from participants for Bank E. Three codes have been identified under customer centricity and has been mentioned 3 times by participants in Banks A, C and E. Two codes have been categorised under customer entrenchment and mentioned 4 times by participants from Bank

A only. Two codes have been assigned to the customer engagement and experience theme, which has been mentioned three times by participants from Banks A and D. Two codes have been allocated to the cost reduction for customers theme and has been mentioned 9 times by participants from Banks A, B and D.

	Bank A	Bank B	Bank C	Bank D	Bank E	Totals	Themes
Affordability Gr=8	2	3	0	3	0	8	Customer entrenchment
Attrition reduced significantly Gr=3	3	0	0	0	0	3	Cost reduction for customers
Consultants also have more time with the customers that do need face time Gr=1	0	0	0	0	1	1	Digital adoption
Cost reduction for banks and customers Gr=6	3	0	0	2	1	6	Customer centricity
Currently 67% of customers are enjoying the great benefits of our digital solutions Gr=1	0	1	0	0	0	1	Customer Engagement and Experience
Customers are using the digital solutions; however, connectivity remains a challenge Gr=1	0	1	0	0	0	1	Profit realisation for Banks
Customers are using these digital solutions however access and costs is an inhibitor Gr=1	0	1	0	0	0	1	
Digitalising cash Gr=1	1	0	0	0	0	1	
Digitalising more customers Gr=1	1	0	0	0	0	1	
Increase in client migration to digital channels Gr=5	3	0	1	0	1	5	
Partially meets rural/low-income customers needs Gr=2	0	0	0	2	0	2	
Profit before tax increase Gr=2	2	0	0	0	0	2	
Profits are increasing but cannot 100% link it to digital innovations Gr=1	0	1	0	0	0	1	
Reducing the banks cost base Gr=1	1	0	0	0	0	1	
Resulted in headcount reduction in banks Gr=1	0	0	0	0	1	1	
The products designed are meeting customer needs Gr=1	1	0	0	0	0	1	
There is customer entrenchment. Gr=1	1	0	0	0	0	1	
Using data to understand client behaviour and provide solutions Gr=1	1	0	0	0	0	1	
Yes, the innovations are working Gr=1	0	0	1	0	0	1	

Table 11: Digital product innovations: Achieving desired results – Yes

Table 12 below, shows banks not obtaining the desired results from the introduction of digital product innovations. The findings yielded 14 codes, which were color-coded and classified into seven categories.

Five codes were allocated to the theme, no value for customers and come up seven times by participants from Banks B, C and D. The digital divide theme has come up again and has two codes allocated and it has been mentioned twice by participants from Banks B and C. Three codes have been categorised under the customer experience theme and mentioned 4 times by participants from Banks A and D. The themes: stagnated customer growth, increased costs for banks,

elderly customer base and implementation of digital product innovations have one code each categorised respectively. These codes have been mentioned 7 times by participants from Bank B and C.

	Bank A	Bank B	Bank C	Bank D	Bank E	Totals	Themes
Adds no value to the LSM 1- 4 customers Gr=2	0	0	0	2	0	2	No value for customers
Adoption is not as high as there is still high footfall in branches Gr=2	0	0	2	0	0	2	Stagnated customer growth
Are we delivering on all clients angst? I do not think so. Gr=1	1	0	0	0	0	1	Digital divide
Customer base and marketshare is stagnant Gr=1	0	1	0	0	0	1	Customer Experience
Customers are using the digital solutions, however connectivity remains a challenge Gr=1	0	0	1	0	0	0	Increased costs for banks
Customers are using these digital solutions however access and costs is an inhibitor Gr=1	0	1	0	0	0	1	Elderly customer base
Do not find value in these digital solutions Gr=1	0	0	0	1	0	1	Implementation of digital innovations
Not realising a reduction in fees Gr=1	0	0	1	0	0	1	
Not really, in most cases it helps in getting money to loved ones. Cost of data remains a challenge and general infrastructure related to connectivity remains a challenge. Gr=2	0	2	0	0	0	2	
Not user friendly, and simple to the lower lsm Gr=1	0	0	0	1	0	1	
One of the biggest issues is that our aging book Gr=4	0	2	2	0	0	4	
Partially meets rural/low-income customers needs Gr=2	0	0	0	2	0	2	
The use of the app is not that important to the lower lsm, does not cater to their needs Gr=1	0	0	0	1	0	1	
Unable to implement new digital technologies fast enough Gr=1	0	1	0	0	0	1	

Table 12: Digital product innovations: Achieving desired results - No

4.4.1.4 The nature and extent of digital adoption and usage

This theme explores the number of customers each bank has in the LSM 1- 4 segment and the percentage of clients who adopt and utilise digital product innovations (table 13 below).

Name of Bank	Number of Customers in LSM 1- 4	% Of Digital Adoption and Usage	
Bank A	1.2 million customers	75% adoption	57% usage
Bank B	1 million customers	45% adoption	30% usage
Bank C	810 000 customers	50% adoption	20% usage

Bank D	Approx. 710 000 customers	55% adoption	20% usage
Bank E	10 – 12 million customers*	80-90% adoption	51% usage

Table 13: Number of customers and % of digital adoption

*Footnote** to caveat, looking at everything from my own perspective. This isn't perhaps entirely accurate; however, this was the response I received from the participant in the interview.

4.4.1.5 The Digital Divide

The theme explores how the digital divide influences the acceptance, adoption, and usage of the bank's digital product innovations; Table 14 below, according to the responses from the participants, these relate to point two on the conceptual framework.

There were 17 codes found, each of which was color-coded and categorized into one of 3 categories aligning to the components of the digital divide framework in chapter 2, figure 11.

4 of the 17 codes identified speaks to the access component and came up 18 times from participants across 4 banks. Interesting to note that the participant from Bank E did not mention access barriers to adoption of digital product innovations. Majority of the codes; 10 of the 17 codes speaks to usage as a barrier to digital product innovation adoption. Participants from all the banks cited the access theme's codes 31 times. Important to note that the literacy element was mentioned 8 times by participants in Bank D, stressing the influence, that literacy has on the adoption of digital product innovations. 3 codes were identified under the benefit theme, and this was mentioned 10 times by participants across all banks. Safety does have an influence on the adoption of digital product innovations.

	Bank A	Bank B	Bank C	Bank D	Bank E	Totals	Themes
Accessibility Gr=6	1	3	1	1	0	6	Access
Affordability Gr=8	2	3	0	3	0	8	Usage
Availability Gr=1	0	0	0	1	0	1	Benefit
Communication Gr=1	0	0	0	1	0	1	
Connectivity is a barrier, even though the app is zero rated Gr=3	1	0	2	0	0	3	
Culture Gr=1	1	0	0	0	0	1	
Customers want that human interface Gr=4	3	0	0	1	0	4	
Increased security Gr=2	2	0	0	0	0	2	
Infrastructure Problems Gr=4	0	1	2	1	0	4	
Lack of digital credibility Gr=1	0	1	0	0	0	1	
Lack of digital literacy or awareness Gr=1	0	0	1	0	0	1	
Language barrier Gr=2	0	1	0	1	0	2	
Literacy Gr=14	1	3	1	8	1	14	
Poverty Gr=2	1	0	0	1	0	2	
Relevance Gr=1	0	0	0	1	0	1	
Safety Gr=6	2	2	0	1	1	6	
Zero Rated Data Gr=2	0	1	1	0	0	2	

Table 14: The Digital Divide

4.4.2 Conclusion Proposition 1

The participants were aware of the digital product innovations being introduced in banks, and they had multiple views on the intent of these digital product innovations and the desired outcomes. It's worth noting that the digital divide was not asked as an interview question, but it has emerged as a major barrier to the acceptance, adoption, and use of digital product innovations.

Consumers with bank accounts are increasingly using online and mobile banking, especially for basic services like checking balances. Branches, on the other hand, continue to play an important role for the rural and low-income segment customers, particularly for transactions involving deposits and withdrawals, as well as overcoming difficulties.

Participants identified several challenges experienced by customers in using digital product innovations to meet all their needs. Other participants stated that in their towns, broadband internet and cellular phone services are not sufficient,

dependable, or economical enough to allow for customers to adopt digital product innovations.

Finally, the elder customers, lack the digital literacy required to use online or mobile solutions as a substitute for in-person access, according to participants.

Implications of digital product innovations

This theme delves into the ramifications of digital product innovations, including if they have unintended negative consequences as well as intended beneficial outcomes, as represented by propositions 2 and 3.

4.4.3 Themes related to proposition 2

Proposition 2: The introduction of digital product innovations could result in unintended consequences.

Interview questions 12 and 15-16 were posed to the participants to understand if the introduction of digital product innovations caused any unintended consequences on the rural and low-income segment customers.

4.4.3.1 Unintended results

The theme explores the ramifications of digital product innovations to discover if they have any unintended negative consequences, as shown in Table 15.

Each of the 24 codes discovered was color-coded and grouped into one of seven themes.

The digital divide theme has resurfaced in the findings, and it has a significant influence on the adoption of digital product innovations. From the findings it is evident that the digital product innovations is not driving unintended results, but adoption is being influenced by components of the digital divide. This theme has been stated 16 times by participants across all banks and has been assigned to 10 of the 24 codes detected.

Alienation is another theme that comes out strongly in the findings with 3 codes being allocated to this theme and cited 26 times by participants across all banks. Two codes were assigned to the financial exclusion theme, showing that digital product innovations do drive financial exclusion. Participants in Banks A and C mentioned it three times.

Three codes have been categorised to the trust theme and has come up thrice by participants from Banks A and B. There are unintended results for the banks as they are seeing a duplication of costs. Two codes have been categorised to this theme and it has been cited three time by participants from Banks A, C and D. Three codes have been allocated to the customer experience theme and has been mentioned six time by participants from Banks A, B, C and D. One code has been categorised to the no cost reduction for customers and only came up once by a participant from Bank C.

	Bank A	Bank B	Bank C	Bank D	Bank E	Totals	Themes
Clients are intimidated by bank Gr=1	1	0	0	0	0	1	Alienation
Communication Gr=1	0	0	0	1	0	1	Financial Exclusion
Connectivity is a barrier, even though the app is zero rated Gr=1	0	0	1	0	0	1	Duplication of costs for banks
Customer resentment Gr=10	3	2	2	2	1	10	Digital Divide
Customers are meant to go into branch for more complex activities Gr=1	1	0	0	0	0	1	No cost reduction for customers
Customers do not fit the profile Gr=1	1	0	0	0	0	1	Customer experience
Customers might not have the type of cellphone so cannot drive the digital strategy with them Gr=1	1	0	0	0	0	1	Trust
Do not find value in these digital solutions Gr=1	0	0	0	2	0	2	
Drives financial exclusion Gr=2	0	0	0	2	0	2	
Duplication of costs Gr=2	0	0	1	1	0	2	
E-wallet is driving unintended results as these clients are not part of the banking eco-system Gr=1	1	0	0	0	0	1	
Forced training Gr=14	4	0	2	6	2	14	
Lack of digital credibility Gr=1	0	1	0	0	0	1	
No it is not driving unintended results, Connectivity is a hurdle; even though certain features are free on the, clients in remote places are unable to use it. This is more about the country's infrastructure problems. Gr=1	0	0	1	0	0	1	
Not at all, in most circumstances, it aids in the transfer of funds to loved ones. The cost of data continues to be an issue, as does general infrastructure associated to connectivity. Gr=1	0	1	0	0	0	1	

Not driving unintended results, however the challenge is that there is a perception that Bank A is an expensive bank. Clients are then advised about the digital innovations and they are then excited about this. To financially include these customers data for the app has been zero-rated. Gr=1	1	0	0	0	0	1	
Not realising a reduction in fees Gr=2	0	0	1	0	0	1	
Not really, in most cases it helps in getting money to loved ones. Cost of data remains a challenge and general infrastructure related to connectivity remains a challenge. Gr=2	0	2	0	0	0	2	
Not user friendly, and simple to the lower lsm Gr=1	0	0	0	1	0	1	
One of the biggest issues is that our aging book Gr=4	0	2	2	0	0	4	
Relevance Gr=1	0	0	0	1	0	1	
Reluctant Gr=2	1	1	0	0	0	2	
The low income and rural customers are heavily cash-intensive, and do not find value in these digital solutions. Bankers need to spend a lot of time educating and creating awareness of these digital solutions with this segment of customers. Gr=6	1	1	0	3	1	6	
Yes, as customers feel that these digital innovations are being imposed on them. Bankers register and activate these solutions for customers, but they still come into branch, so usage is very low. Gr=2	0	0	0	2	0	2	

Table 15: Unintended Results

4.4.4 Conclusion Proposition 2

The participants agreed that digital product innovations does have unintended consequences for rural and low-income segment customers. Banking customers in the rural areas report higher expenses and less convenience in obtaining financial services. Certain groups, such as those with lower incomes or less reliable mobility, and the elderly customers appear to have more difficulties.

4.4.5 Themes related to proposition 3

Proposition 3: Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater financial inclusion and the provision of a wide range of additional financial services.

Interview questions 13-14 and 17-20 were posed to the participants to understand if the introduction of digital product innovations created the intended positive results for the rural and low-income segment customers.

4.4.5.1 Intended positive results

The theme explored if the introduction of digital product innovations provided intended positive outcomes to rural and low-income customers. Table 16 illustrates that the research yielded 41 codes, each of which was assigned a colour and categorized into one of eight themes.

Sixteen of the 41 codes were categorized using the customer experience and engagement topic. Participants from all five major banks referenced these codes 61 times. Two codes were allocated to the big data theme and come up four times by participants from Bank A. Four codes were categorised to the customer entrenchment theme and came up 8 times by participants from Banks A and C. All participants unanimously agreed that it promotes financial inclusiveness. This was mentioned eight times by participants across all banks.

The enhanced client lifetime value theme, which was stated 29 times by participants across the banks, was assigned six codes. Two codes were assigned to the customer cost savings theme and were mentioned twice by Bank A participants. The theme of increased profit before tax includes seven codes and has been mentioned 13 times by participants from Banks A, B, C, and E. Four codes have been allocated to the awareness, education and training themes, has been mentioned 4 times by participants from Banks A, B and D.

	Bank A	Bank B	Bank C	Bank D	Bank E	Totals	Themes
A better customer experience Gr=3	1	1	0	1	0	3	Customer Experience and Engagement
Ability to understand customer behaviour from enhanced data collection Gr=2	2	0	0	0	0	2	Big Data
Accuracy Gr=2	2	0	0	0	0	2	Customer Entrenchment
Achieving desired results Gr=10	3	1	2	3	1	10	Financial Inclusion
Attrition reduced significantly Gr=2	2	0	0	0	0	2	Enhanced Client Lifetime Value
More customer centric Gr=3	2	0	0	1	0	3	Customer Cost Savings
Comfortable and familiar with platform Gr=3	1	2	0	0	0	3	Increased Profit Before Tax
Creates excitement Gr=1	1	0	0	0	0	1	Awareness, Education and Training
Creates financial inclusion Gr=8	1	1	3	2	1	8	
Creates transparency Gr=1	0	0	1	0	0	1	
Improved Customer engagement Gr=2	1	1	0	0	0	2	
Customer lifetime value Gr=11	4	3	1	2	1	11	
Customer VSI increased Gr=1	1	0	0	0	0	1	
De-cashing the economy Gr=2	2	0	0	0	0	2	
Digital Fraud Warranty Gr=1	0	1	0	0	0	1	
Digital solutions welcomed by customers Gr=12	4	4	2	1	1	12	
Digitalising cash Gr=1	1	0	0	0	0	1	

Digitalising more customers Gr=1	1	0	0	0	0	1	
Ease of Use Gr=11	3	4	2	1	1	11	
Creates Efficiencies Gr=1	0	1	0	0	0	1	
Enhanced quality of life Gr=4	1	3	0	0	0	4	
Entrenchment of customers Gr=2	1	0	1	0	0	2	
Financial savings for not driving to branch Gr=1	1	0	0	0	0	1	
Increase in client migration to digital channels Gr=5	3	0	1	0	1	5	
Increased security Gr=2	2	0	0	0	0	2	
Increased Usage Gr=11	2	2	4	2	1	11	
KPI on bankers scorecards to drive digital adoption Gr=1	0	1	0	0	0	1	
Meets customers social and technical needs Gr=1	1	0	0	0	0	1	
Offers convenience Gr=9	3	4	0	1	1	9	
Onboarding – 70% of footfall in branch Gr=1	1	0	0	0	0	1	
Opens them to new banking products and services, new payment methods Gr=1	1	0	0	0	0	1	
Profit before tax increase Gr=2	2	0	0	0	0	2	
Realising a financial savings Gr=1	1	0	0	0	0	1	
Reduced customer attrition Gr=3	3	0	0	0	0	3	
Reducing the banks cost base Gr=1	1	0	0	0	0	1	

Service migration inside the bank is important as it allows you to have better quality engagements with clients Gr=1	1	0	0	0	0	1	
Speed of transactions and services Gr=1	1	0	0	0	0	1	
Stronger client relationship Gr=1	1	0	0	0	0	1	
Bankers are spending a lot of time educating and training this segment of customers to use digital channels. Gr=1	0	0	0	1	0	1	
Usage has increase to 30% Gr=1	1	0	0	0	0	1	
Yes we are seeing an increase use of smart phones technology throughout our customer segments, however, our digital adoption rates can be improved a lot. We have created targets for our sales consultants which is measured in their year-end Performance discussion, digital adoption has the highest weighting in their KPI's with the main focus of selling a basket of products instead of just a savings or cheque account. Gr=1	0	1	0	0	0	1	

Table 16: Intended Positive Results

4.4.6 Conclusion Proposition 3

Digital product innovations, according to the participants, has a positive influence on rural and low-income segment customers and banks. Even though the transition to digital platforms is taking longer, and this is especially true for those who are elderly, who have lower incomes, or have completed fewer years of formal education, and live-in rural areas, the banks are realising positive results from the introduction of digital product innovations.

4.5 Summary of the findings

The findings presented in this chapter used a system that obtained the data using a major instrument, the interview guide, the data collected from the participants was then put into categories of emergent themes using Atlas.ti 9 software and thematic analysis. Though vulnerable to criticism, this strategy is merely one means of achieving the goal of capturing as many different responses as possible in a simplified manner.

In the interviews, participants emphasized key themes both explicitly answering questions and by expressing superfluous perspectives in open-ended questions, as expected. Themes directly influencing the concept of digital product innovations, as well as intent, adoption, acceptance, usage, customer engagement, relevance, education and awareness, desired outcomes, implications such as unintended and intended results, were among the numerous categories obtained. Based on the data analysis conducted, it was concluded that customers would most likely adopt and utilise digital product innovations that they perceive to be useful, relevant, secure, risk-free, convenient, provides value for their money, reduce bank costs and that is easy to use. Additionally, the findings proved that age and trust, does have an influence on the adoption and usage of digital product innovations. Participants advised that there is reluctance from the elderly aged customers to adopt digital product innovations.

The interconnectedness of many of the collected viewpoints indicates the depth of the topic under discussion, and it serves as a signal for future research using qualitative, quantitative, or mixed methods methodologies.

The participants in the interview processes, were all senior managerial employees from the large South African banks, and provided convergent and divergent information, allowing for cross-comparisons between the participants perspectives.

The participants are at the forefront of digital transformation at their respective banks, involved at a strategic level to ideate, develop, and implement digital

product innovations for the rural and low-income segment customers of the banks. These numerous views improve the trustworthiness of findings and subsequent interpretations for a flexible and situational notion like dependability.

The findings reported in this chapter represent an attempt to not only reinforce but also to extend and bridge gaps in creating awareness that would aid the leadership in the banking industry to engage and develop digital product innovations suited, needed and are relevant for the rural and low-income segment customers. In the following chapter, the findings are discussed, debated, and theoretically contextualized.

CHAPTER 5. DISCUSSION OF THE FINDINGS

5.1 Introduction

The aim of this chapter is to discuss the research findings for the three propositions being explored to determine the influence of digital transformation on low-income, rural customers in the large South African Banks. Chapter 5 discusses the research's primary findings and, where applicable, connects the literature to the research findings.

Technology has changed the way people communicate and conduct business, and it is probable that individuals and businesses throughout the world will continue to use it in the future.

It was vital to understand the challenges that connect to the subject of digital product innovations and its acceptance, whilst considering the elements that may have a positive influence as a result of the adoption and usage of digital product innovations introduced by banks on rural and low-income customers.

The revised conceptual framework, figure 24 below, is an extension of figure 20 shown in chapter 2, which seeks to explore the below 5 points. The findings in chapter 4, addresses points 4 and 5 below which will be addressed in each objective. The researcher shows the positive and negative outcomes experienced by customers and banks on the introduction of digital product innovations.

1. What digital product innovations are being introduced by banks in their digital transformation journey?
2. The Digital Divide: how does the digital divide influence the acceptance of these digital product innovations introduced by the bank through the lens of the TAM? The filter illustrates the barriers or acceptance of digital product innovations.
3. What is the nature and extent of digital adoption by rural and lower income segment customers?

4. What are the positive and negative outcomes for customers?
5. What are the positive and negative outcomes for banks?

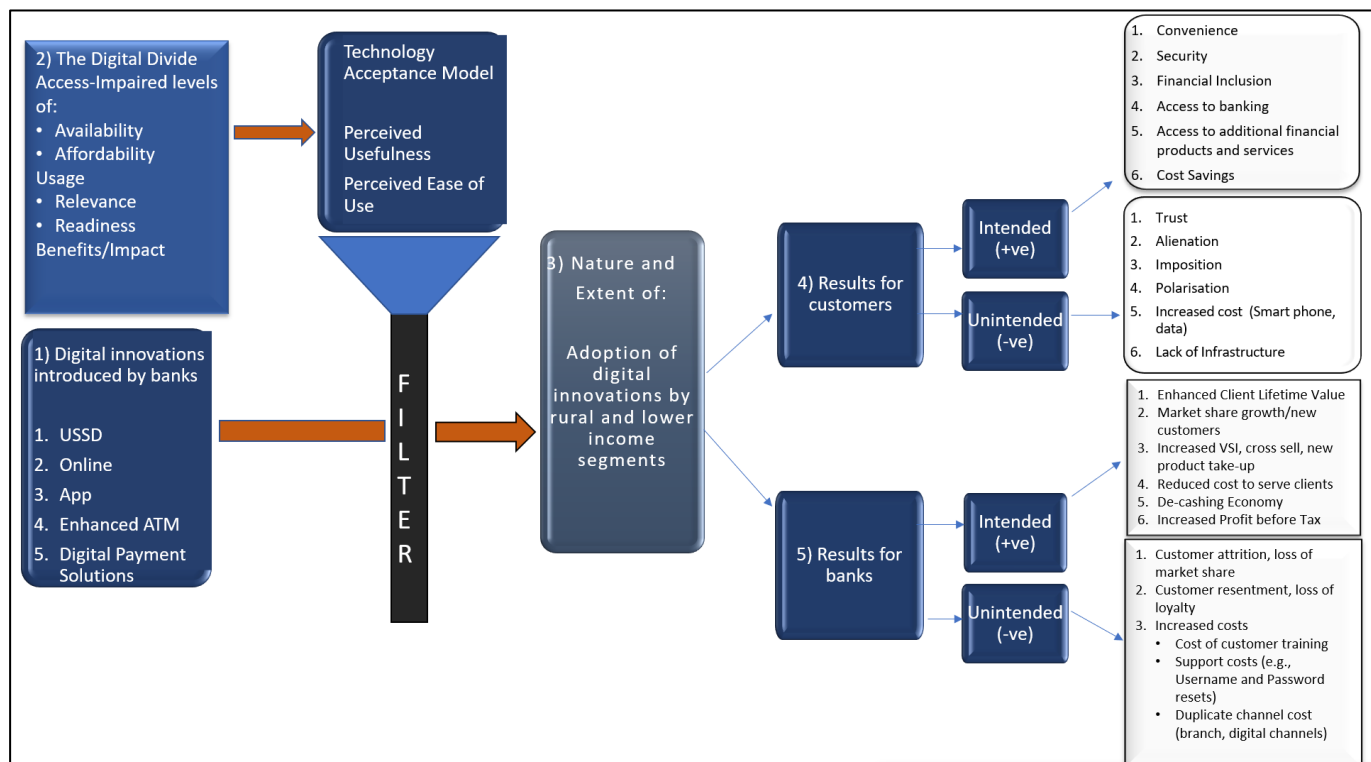


Figure 24: Revised Conceptual Framework

5.2 Discussion pertaining to Proposition 1

Proposition 1: Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.

The findings presented in chapter four, relating to proposition one, can be used to derive a variety of inferences. Even though the data collected was from a limited sample, the researcher believes the findings and insights provide valuable information that can be used to understand if the introduction of digital product innovations is achieving the desired results.

In chapter 4 the researcher needed to understand 1) what digital product innovations are the banks introducing? 2) what the intent of the banks where, by introducing digital product innovations? To address research objective one which is: are these digital product innovations achieving the desired results?

5.2.1 Digital product innovations introduced by banks

The findings of this study demonstrate that the top five banks are introducing a variety of digital product innovations (described in Chapter 4), which supports the conceptual framework's point 1. Traditional financial services are automated through digital banking. Customers can use electronic, online banking, apps, USSD (cellphone banking), and chat banking platforms to access banking products and services.

Digital transformation, involves digitizing banking activities and replacing the bank's physical presence with an always-on internet presence, customers no longer need to visit a branch.

5.2.2 Intention of digital product innovations

During the interviews, participants confirmed that the banks are undergoing a continuous rapid digital transformation journey, offering a wide range of digital banking services and products to their customers to improve customer experience and engagement, create efficiencies, creating financial inclusion by developing viable digital product innovations for customers in rural areas, reduce operating costs, increase revenue, and become more customer centric and differentiate from competitors.

According to Kitsios et al. (2021), the banking industry is undertaking a digital transformation journey, which is a continuous process that improves internal procedures and systems and has an impact on both the external and internal environment. Serving rural areas without physical branches, standing out from the competitors, and lowering operating expenses are all reasons for digital transformation. According to Lotriet & Ditshego (2020), banks are under

tremendous pressure to adapt their methods and business models to become more customer-centric in order to remain competitive.

The findings of this study support this position. According to many of the participants in this study, large banks in South Africa have noticed the change and are working to transition their business model from a product centric to a customer centric model. This shows that banks have recognized the importance of rural and low-income segment customers and are responding appropriately by delivering digital solutions tailored to this segment.

Similarly, Mărăcine et al. (2020), believe that banks can improve business models in five ways: offering specialized platforms, addressing ignored consumer categories, enhancing customer engagement, lowering operating expenses, and optimizing business processes.

The findings revealed that there were divergent and convergent views on this theme by the participants. The researcher looked at the theme in a variety of circumstances, all of which lead to distinct outcomes. We will begin with the exploration of the achieving desired results “yes” theme followed by the achieving desired results “no” theme.

5.2.3 Digital product innovations: Achieving desired results (Yes)

The findings suggest that the introduction of digital product innovations is achieving the desired results. The following outcomes have been achieved due to digital product innovation adoption and usage:

- *A decline in customer attrition*
- *An increase in customer entrenchment*
- *Increase in market share*
- *An increase in profit before tax for banks*
- *Cost reduction for customers*
- *Improved customer engagement and experience*

The above outcomes fundamentally confirm that digital transformation reduces costs, improves process efficiency, improves customer experience and engagement, and has an indirect positive influence on consumption.

These study findings are aligned to the outcomes by Krasonikolakis et al. (2020), who also acknowledge that in the retail banking value chain, one of the most visible achievements of digital transformation is value generation. Transferring additional value to customers aids in client retention and competitive management, illustrating that banking services are more of a necessity than a urge, maintains high levels of trust and customers are at the epicenter of this value creation.

The findings also demonstrated that when bank employees provide awareness, education, and training, low-income and rural segment customers are more likely to accept, adopt and use digital product innovations. This has undoubtedly been the case for Banks A and E, which is evident in their digital adoption and usage numbers.

Participant 3 from Bank A stated that, *“Yes, just on app for the lower income segment, there was a 180 000 migration from USSD to app, they experienced reduced attrition, and have seen a profit before tax increase”*. Participant from Bank E stated, *“Yes, there has been a lot of the service type transactions that have been migrated out of the branch this has reduced the head count in a lot of branches as you don’t need all those warm bodies to help customers. Consultants also have more time with the customers that do need face to face help”*.

According to a 2015 study by Jacob (2018), 47 percent of bankers see digital banking as a way to strengthen client relationships, 44 percent as a way to gain a competitive edge, 32 percent as a way to acquire new customers, and 16 percent as a way to save money. According to Sharma (2014), in India digital channels do reduce transaction costs for banks.

The findings from this study revealed that the desired results envisioned by banks are being achieved. However, the real benefit that is realised is that the low-

income and rural segment customers are more engaged with the bank via digital platforms. The achievement of favourable results is being felt across the country, and this is a fantastic result for banks.

5.2.4 Digital product innovations: Achieving desired results (No)

The outcomes discussed in section 5.2.2, were not shared by all participants. Participants agreed that banks are introducing digital product innovations and a lot of these solutions are not suited to the rural and low-income segment customers. Solutions being introduced cater for all segment customers (that is LSM 1 to 10) and are not specifically being tailored to meet the needs for this segment of customers.

A participant alluded that the banking app was created by designers who have developed it as they would like it to work, rather than for the intended market. He further went on to state that even though he is literate and works in a bank, and has the potential to adopt and use these innovations he struggled at first to navigate the app. It took him a long time to get to grips on how the app worked. This should be particularly concerning for banks, as they should be designing solutions with the end user in mind to meet customer needs, ensuring simplicity and considering the user and customer experience.

It was imperative for the researcher to understand the degree of adoption of digital product innovations by rural and lower income segments. The findings (supporting point 3 on the conceptual framework), revealed that: Bank A has 1.2 million customers in the rural and low-income segment, 900 000 customers have adopted digital solutions and 517 000 customers utilise digital solutions. Bank B has 1 million customers in the rural and low-income segment, 450 000 have adopted digital solutions and 202 500 customers utilise digital solutions. Bank C has 810 000 customers in the rural and low-income segment, 405 000 customers have adopted digital solutions and 81 000 customers utilise digital solutions. Bank D has 710 000 customers in the rural and low-income segment, 355 000 customers have adopted digital solutions and 71 000 customers utilise digital

solutions. Bank E has approximately 12 million customers in the rural and low-income segment, 10 800 000 customers have adopted digital solutions and 5 508 000 customers utilise digital solutions.

The desired outcomes are being achieved to an extent by Bank A and E, they have a higher adoption and utilisation rate relative to Banks B, C and D. The numbers for Banks B, C and D are quite concerning, with a 20% and 10% (shared by Banks C and D) usage rate respectively. This is a national occurrence.

So, what are Bank E and, to a lesser extent, Bank A doing right to have considerably higher digital adoption and usage rates than the other three banks? Bank E has a significant market share in this customer segment. The findings for Bank E revealed that, they have created an app that allows the customer the ability to do most of their banking on the app like other banks but without all the complexities. The experience helps build confidence and this improves adoption. Bankers also work extensively with customers if they do visit the branch to show them how easy it is to use the app which inspires confidence.

Bank A's findings revealed that they have restructured segments, effectively solving for this customer segment, and ensuring that the bank is meeting these customers' needs. There are an increasing number of solutions being developed to assist these customers.

Banks B, C, and D may face the following repercussions if they do not respond swiftly:

- *Loss of market share to competitors that are addressing this customer segment*
- *Revenue loss*
- *Brand reputation risk*
- *Failure to attract new customers*

It was vital to establish what was preventing customers from adopting and using digital product innovation.

5.2.5 The Digital Divide

The study's findings reveal that the digital divide has a major influence on the rural and low-income customers' adoption of digital product innovations.

Participants revealed that the adoption and utilisation of digital product innovations is low, and is highly contingent on client knowledge, awareness, relevance, usefulness, ease of use and/or appropriate information being disseminated. Furthermore, it was found that this segment of customers is highly cash intensive, and they also face numerous barriers in the adoption and utilisation of digital product innovations such as inadequate ICT infrastructure, cost of data, cost of electricity, literacy and language barriers, connectivity issues, availability and affordability as well as benefits impact, which are elements of the digital divide.

Participant 1 from Bank D stated *"They are fully covering the higher lsm segment, the lower end of the lsm it partially does. The low-income and rural segment customers are operating with issues of literacy, inadequate cellphone infrastructure, no electricity, types of cell-phones being used that is, they do not have phones to accommodate the app, there is a market that is not being catered for, the market in rural areas are very cash intensive, the use of the app is not that important to the lower lsm, does not cater to the need. Not user friendly, and is not simple to the lower lsm"*.

The research further explored which elements of the digital divide truly impede adoption, and why and how do they do so?

Access: Inadequate ICT infrastructure has been identified as a major barrier to digital product innovation adoption and use. A lack of ICT infrastructure in rural areas exacerbates the influence of digital divide on the lives of low-income and rural segment customers.

The findings revealed that rural areas are also being left behind, while urban metro regions benefit from an expansion of fibre optic cable infrastructure, and

are preparing for the coming of 5G networks, and have more consumer choice for fast internet connectivity. As the cost of extending mobile broadband coverage becomes less of a concern, the divide is being explained more by affordability and defined by access quality. Why is this the case?

According to the WorldBankGroup (2019) report, South Africa has struggled with policy instability and has been reluctant to enact regulatory reforms, resulting in a significant digital divide. Mobile operators' ability to build their 4G networks and provide better speeds on existing networks has been hampered by delays in spectrum assignment. Most of the goals set out in the national broadband strategy, SA Connect, have not been met, and the strategy needs to be updated. South Africa's quality of service is rated lower than that of similar countries, and mobile data prices are high, particularly for poorer, rural customers. The existing regulatory and commercial environment isn't resulting in enough digital inclusion, and state-run access programs haven't been able to close the gap.

Usage: Digital literacy and skills: the findings revealed that the digital divide is more than just a problem of access, and that it cannot be solved simply by supplying the appropriate technology and digital solutions. Information accessibility, information use, and information receptiveness are at least three aspects at play. Customers must know how to use these technologies and solutions, which is more than just accessibility. Regardless of the customers economic condition, bankers can help bridge the divide by providing awareness, education and training services to help customers understand and use the solutions to which they do have access.

According to the findings, there is a negative relationship between the digital divide and the adoption of digital product innovations introduced by banks for low-income and rural segment customers.

So, what are the implications for the digital interventions by banks?

Banks need to drive digital literacy and customer education: to persuade customers to adopt digital solutions, there will be a need for corresponding digital literacy and consumer education. To accomplish this, banks must:

- Deliver adequate digital infrastructure and services to rural areas and to create a conducive environment for customers to compete in the digital economy, a concerted effort among financial-sector stakeholders and government is required.
- Customer awareness and education that is suitable: banks must incorporate suitable education and awareness into their customer journey processes to ensure that customers are aware of the risks and benefits associated with digital banking activities, as well as how these products and services operate.

The findings are aligned to the literature review in chapter 2 and previous studies conducted. Despite significant increases in worldwide internet usage, according to the International Telecommunication Union (ITU), more than half of the world's population (3.9 billion) was currently online as at 2018. The bad news is that half of the population is still without access to the internet. The "other half" generally lives in developing countries, where only around half of the population has internet access. Most people offline are almost certainly in rural and emerging areas. In the case of Africa, the continent still lags in terms of ICT availability, cost, and use. Africa continues to have the lowest ICT development index, according to (ITU, 2018). Henry (2019), in his study states that the digital divide does influence the adoption of digital product innovations.

The following are some of the most common issues according to Henry (2019), that prevent the adoption and use of ICTS:

- *Electricity shortages, particularly in rural areas; 15 percent of the world population is estimated to be without electricity*
- *Literacy: many (13 percent) are still incapable of basic reading and writing*
- *Gender: women are 50 percent less likely to be online*
- *Poverty: millions of people still live below the international poverty line*

- *Affordability: many countries' high broadband access costs*
- *Language: Most of the online material is only available in a few languages.*
- *Local content: a lack of locally appealing apps makes it difficult to use.*
- *Network coverage: 3G networks covered 70% of the population, but only 29% of the population.*

Participants noted that rural and urban areas had different adoption and usage rates for various items and services. Rural areas had lower adoption rates than urban areas. Customers are sometimes aware of a variety of digital products and services but do not intend to use them, and on the other hand, other customers are completely unaware of their existence. As a result, the study discovered that the more customers are aware of digital product innovations and the benefits it provides, the more likely they are to adopt and use it.

This shows that customers who are exposed to any sort of communication about digital product innovations, whether through advertisements or peer experiences, are more likely to use it. This raises awareness of digital product innovations, which leads to increased visibility. The findings imply that those who are uninformed of digital product innovations are less likely to use the service due to a lack of awareness. Customers costs are also increased because of a lack of awareness, which can be seen in travel expenses to get to banks.

The elements indicated above are in line with the responses provided by participants. Participant 1 from Bank C stated, “Yes the innovations are working, however the uptake is not as high as there is still traffic in the branch, could be a lack of digital literacy or awareness.” According to Diener & Špaček (2021), there are various barriers to technology adoption, including gaps in knowledge, products, and customer participation. Customers are unaware of available options and are unfamiliar with banking and technological concerns.

The findings also suggested that there is still a high footfall in branch, customers are adopting digital product innovations, however usage is very low. This suggests that even though customers are aware of digital product innovations, their refusal

to utilize it could be related to a lack of readiness, relevance or resistance to the new technology and innovations introduced by banks. As a result, a change in behaviour would be required.

According to Velasque (2020), majority of the individuals now carry a bank in their pockets in the form of a smartphone and only go to a physical branch on rare occasions. This is not aligned to the findings from this study where the physical presence remains an important facet for banking customers, with the rural and low-income segment customers still visiting physical branches to deposit or withdraw cash, or to seek out advice and learn more about bank services. The branch banking environment continues to be a key customer touchpoint and sales channel. According to Bain & Company's (2016) research, around 60% of branch teller transactions are generated by 10% to 20% of consumers.

Another challenge raised was the aging client book of banks, which the researcher enquired about more when the participant was asked what the aging book signified. The participant stated that they have a large number of elderly customers, and that there are gaps in the digital products and services that banks are introducing in comparison to what these customers require and want. Furthermore, these customers are indigenous to the bank, and the bank is not attracting as many younger generation clients who are more digitally savvy and prefer digital banks that meet their needs. This study shows similarities to other studies in that, despite the potential benefits of digital product innovations, elderly people regularly adopt technology at lower rates than younger people (Berkowsky et al., 2018).

Only Banks B and C mentioned this observation, and it is a countrywide occurrence for them. The banks' risk is that they will alienate these customers, resulting in customer attrition and loss of loyalty. This could harm the bank's reputation by implying that they don't value or understand their clients' needs.

5.2.6 Technology Acceptance Model (TAM)

TAM is a component on the conceptual framework, and its purpose is to see if perceived usefulness and ease of use influence the adoption of digital product innovations.

The findings suggest that customers will adopt digital product innovations if it proves to add value and is useful. It has also been discovered to alter a person's attitude toward technology, which in turn affects how the system is used. Customers are more likely to embrace or employ a digital product innovation if they believe it will benefit them and will be easy to use.

The digital divide, according to the participants, has a significant effect on whether customers find digital technologies valuable and simple to use. Customers in this segment have literacy and language obstacles to overcome. The majority of the participants agreed that perceived usefulness and perceived ease of use have an influence on customers in the rural and low-income segments in adopting digital product innovations.

The findings indicate that the elements of TAM, that is PEOU and PU has a positive relationship with low-income and rural customers adopting and using digital product innovations.

5.2.7 Conclusion of findings relating to proposition 1

The researcher gathered information using a qualitative data technique in order to see if banks' desired outcomes are being realized. The findings of the study show that the participants have varied perspectives, with the majority of them believing that the digital product innovations used by banks are not yielding the desired results.

To conclude the findings for P1: The divergent views from the participants on the desired outcomes indicates that the digital divide has the greatest influence on the adoption and the utilisation of digital product innovations. Elements of the digital divide, such as access: availability, affordability, usage: relevance, readiness has

a massive influence on the adoption and utilisation of digital product innovations and, to a large extent, plays a pivotal role in terms of obtaining answers by banks, if the desired results are being achieved by the introduction of digital product innovations, as evidenced in this research paper.

TAM elements such as perceived usefulness (PU) and perceived ease of use (PEOU) has a positive influence on the adoption of digital product innovations by rural and low-income segment customers. However, the digital divide has an influence on the elements of TAM: PU and PEOU, as these elements will only bring value to customers in the rural and low-income segments if they have access to and use digital product innovations. This study findings is consistent with the study conducted by Marakarkandy et al. (2017), whereby, customers' attitudes toward technology-enabled banking services are positively influenced by perceived ease of use and perceived usefulness, which has been recognized as a key element.

Customers in the rural and low-income segments have a variety of challenges when it comes to adopting and utilizing digital technologies. Customers will feel aggrieved by change if the proposed digital solutions and methods are difficult to comprehend; they will continue to use traditional banking processes, this will result in banks not achieving the desired results envisioned by introducing digital product innovations.

To summarize the findings of the study, it is clear that Bank E, and to a lesser degree Bank A, are achieving the expected results because they have recognized that this is an important customer segment for their business. Bank A, recognises that not all customers can afford smartphones to download the app. They have identified the problem and have developed capabilities on USSD (cellphone banking) for customers who have feature phones.

One may argue that the other three banks do not consider this customer segment to be important to their business. Participant 1 from Bank D claimed that the bank is oblivious about what is happening on the outside and is building all of these

amazing solutions with the goal of making people's lives easier. Not comprehending that these clients don't have access to digital solutions, aren't literate enough to use it, or, more importantly, that it doesn't meet their needs.

Based on the findings of this study, banks should continue to introduce digital solutions that are relevant to this customer segment. It is, nonetheless, critical to comprehend customer requirements and solve appropriately. Banks should interview their customers to listen to their concerns and needs. The key to delivering digital solutions is simplicity and understanding who the target audience is.

5.3 Discussion pertaining to Proposition 2

Proposition 2: The introduction of digital product innovations could result in unintended consequences.

The findings in Chapter 4 can be used to derive several different conclusions. Although the majority of the participants agreed that digital product innovations nearly always does have unintended consequences for rural and low-income clients, some participants believed that digital product innovations do not drive unintended consequences.

Participants were asked interview questions 11,12,15 and 16, for the researcher to explore if the introduction of digital product innovations does drive unintended consequences.

5.3.1 Unintended results

The findings suggest that digital product innovations do drive unintended results both for customers and banks.

From a customer perspective this study findings illustrate (supporting block 4 of the conceptual framework, customer: unintended consequences), that the introduction of digital product innovations is driving unintended consequences:

- *Customer alienation: customers refusal to accept the dogma of consumption or a failure to find fulfilment in the digital product innovation. Despite customers adopting the digital product innovations, usage is very low as these customers want that human interface.*
- *Financial exclusion: rural and low-income segment customers are impacted by the digital divide, facing several barriers in the adoption of digital product innovations. Participant 1 from Bank D stated that, “Digital product innovations drives financial exclusion, it’s an imposition on the client, the bank is doing things to fulfil their needs and not client needs. There is a security compromise for customers, customers who are semi-literate need to get their daughter or son to assist them on digital channels, whereas they could conduct their own banking if they went into a physical branch. He also states that banks have not taken into consideration: poverty. Customers in this segment are very poor and every cent and rand is important to them. No cost reduction for customers: customers are not realising a savings, 1) in order to avail of these solutions customers, need to have a smartphone; 2) due to the high cost of data, customers are out of pocket to one purchase a smart phone to support the digital product innovations and they need data to access these solutions.*
- *Loss of trust: customers are faced with literacy and language barriers. It will be difficult for individuals to execute digital tasks if they cannot read or understand what is expected of them; also, they may perform the incorrect function and lose money.*

Participant from Bank E responded, “ Yes. I think the other side of the coin is people being scammed and robbed of their hard-earned money. Specially in this segment where customer education is so important. People have lost their life savings by pressing on a link etc. Security for this base is so important because once there is trust issues adoption becomes impossible due to the word of mouth that is spread about negative experience”.

According to this study findings and literature reviewed, the introduction of digital product innovations does drive unintended consequences on the rural and low-income segment customers. Facets of the digital divide enter the equation once

more. The study findings highlight that cost, digital literacy, trust, and relevance are key factors of the digital divide impeding digital product innovation adoption.

Access: The cost of data has been mentioned several times as a barrier to digital product innovation adoption and utilization in the findings. For this customer segment, money is extremely valuable. That R20, for example, is the difference between who will eat tonight. As a result, there is undoubtedly a trade-off. Do I buy data or food as a customer? Considering mobile network operators' contributions to expanding communication access in rural areas, the development benefits that enhanced connectivity promises to bring to underserved areas remain unrealized. Most people cannot afford digital communication, and rural residents pay more for both voice and data communications than their urban counterparts (Rey-Moreno et al., 2016). While 1GB of data costs around R160, many people in poor townships and rural areas can only afford a few rands at a time - often as little as R10, which isn't even enough for 20 Megabytes (MB) of data (Chothia, 2017). Providing access to digital technologies does not guarantee usage.

The findings revealed that banks have identified data cost as a significant impediment to digital product innovation adoption. They've zeroed out the banking app for this customer segment, and Bank A is creating a lot of capabilities on USSD (cellphone banking) for customers who don't have or can't afford a smartphone. The app can only be used on a smartphone with an active data plan, but the USSD code can be viewed on any phone from any network provider, and it does not require an internet connection or data to function.

Usage: In our engagement with participants, it was discovered that the reality of the digital divide is more complex. The findings revealed that customers find "no need/no relevance" to adopt digital product innovations. This is however based on other factors such as cost, a lack of digital literacy, a lack of trust, and a lack of knowledge of the benefits that one can derive by adopting and utilising these digital product innovations.

Banks need to actively create awareness, educate and train customers around their digital solutions. When it comes to new digital solutions and processes in banking, customers aren't necessarily confident. The participants described customers as "digitally illiterate", and that these customers also feared forgetting, losing passwords, or making errors. In-branch bankers play a pivotal role in instilling confidence in customers.

Impact: Low-income and rural segment customers are also hesitant to adopt and use digital solutions due to misconceptions about security risk and trust, with some of the reasons cited as fraud and identity theft. Customers who lack digital literacy are also vulnerable to risks such as misinformation and breach of privacy.

To close perception disparities, banks must address persisting fallacies about the security of digital solutions and prioritize customer education. More clearly presenting security elements, such as encrypted payment details and bankers need to assist customers to overcome security and trust concerns related to digital product innovations.

A study done in Kenya found that digital product innovations have no impact on financial inclusion (Agufa, 2016). A study done in South Africa found that there is mistrust and security concerns in the digital banking sphere (Ikdaal, 2017).

From this study findings, participants voiced that customers are not seeing a reduction in fees, for example participant 2 from Bank A stated that *"They are not seeing an entrenchment of customers onto digital solutions, customers forget their login credentials and need to come back into branches to have this reset"*. Participant 2 from Bank B states that, *"The bank is placing pressure on customers to migrate and adopt digital solutions"*.

According to the findings of this study, the national overview suggests that this occurs across the country. The move to digital solutions is taking longer for this segment of customers in all South Africa's large banks. This is especially true for those who are older, have lower incomes or have completed fewer years of formal education, or live-in remote areas.

The severity of unintended consequences for these customers who do not adopt digital product innovations is that they do not realise a savings: 1) in terms of banking costs; 2) in terms of transportation costs; and 3) in terms of time. They also run the risk of not being part of the financial eco-system, which could drive financial exclusion. Banks would not have the ability to gather data on these customers to offer them tailored solutions which potentially will unlock more banking opportunities.

A very interesting finding is that for the low-income and rural segment customers money is very extremely valuable. For a long time banks needed to convince this segment of customers to open a bank account and illustrate value. With this came the monthly account fee. Which for the customer was their money and the banks took it, also why should they pay a bank to keep their money. That was hurdle number 1 that banks needed to overcome which is still work in progress. Today banks are moving away from these traditional channels and trying to get clients to adopt a channel which is highly unfamiliar to them.

Participant 4 from Bank A stated that, “ *Money is very precious, their life is infinitely more cash based, which is a hurdle as the bank is trying to move everything onto digital and these customers still live-in cash. These clients are coming in with very little, but to their reality, they're very, very important things because that R10 and that R20 is a difference between who will eat tonight. There is a lot more basic education you do with clients in this segment that digital cannot support that the branch must carry, these client's value of funds is more important in terms of rand spent and a lot of time is spent doing basic banking with these clients in our lens*”. *Clients are intimidated by bank and need help, service migration inside the bank is important as it allows you to have better quality engagements with clients*”.

One could pose a question, in such a cash-heavy world, why are clients in this segment so cash-heavy. Vendors in rural and low-income areas lack payment solutions such as point-of-sale devices or digital payment solutions to accept card payments or electronic fund transfers, according to this research findings. This is

supported by the statement from participant from Bank E: *“Yes, if you look at the benefits it offers especially in the rural areas it is very useful, however banks need to drive better payment solution to vendors in the area so customers can harness the full potential of the app and cards”*.

One can argue the point that even though customers want to adopt and use digital solutions, the acceptance of these solutions in their areas is limited. This is an additional barrier to adoption and utilisation of digital product innovations identified in this study. Banks need to understand the system of interest that the rural and low-income customer segments operate in.

The research findings from this study show some consistency with findings from other academic articles. According to Ozili (2018), profit-seeking organizations, such as banks, financial and non-financial institutions, use digital product innovations to increase their profitability or the profit potential of enterprises linked to digital finance providers, such as banks, financial and non-financial institutions, are known as suppliers of digital finance services.

Mitham (2021), states that the following are unintended outcomes experienced by customers:

- *Security: One of the most significant difficulties for banks is security, which arises from the potential downsides associated with online banking. Cyberattacks and fraudulent behaviour is a reality, despite the fact that financial systems are built to be virtually impervious. The user's lack of privacy knowledge is exploited by fraudsters. Customers are prone to internet cyberattacks such as login credential theft and phishing, which could result in fraudulent bank transactions, due to vulnerabilities such as weak passwords and the use of insecure networks.*
- *Technical Issues: When customers use the internet, they run the risk of encountering technology and service failures. If the connection is delayed or unavailable, system stability and efficiency can limit customers' ability to access their accounts. Bank servers, too, are vulnerable to both deliberate*

and unintended outages, regardless of how advanced the technology is. When the system is down, customers are unable to make payments or conduct transactions, and there are also concerns about data and fund security.

- *Lack of human element: Even though 73 percent of the world's population utilizes online banking at least once a month, meeting more complicated client needs solely through digital banking can be challenging. The advantages of having a personal contact with your bank are often ignored, as bankers can often help you resolve complex financial problems. Customers may compare their alternatives and find solutions tailored to their needs with an in-person banking relationship, which is harder to achieve with self-service banking.*

According to Arqué (2019), financial inclusion is the process of ensuring that everyone has access to appropriate financial services. In recent years, the number of bank branches in Spain has decreased, putting certain rural consumers at danger of financial exclusion. This is mostly due to the digitalization of banking services and the fact that younger generations are more acclimated to digital banking. He poses a question “Why is it important to have bank branches in rural areas and why is the risk of financial exclusion a concern?” and found that, the preference for physical channels is likely to be even stronger in rural areas, because, this is a less digital demographic that relies more on a branch to meet their needs. He also discovered that people in rural areas utilise digital product innovations less than their urban counterparts.

This came out strongly in the current research whereby, Participant 4 from Bank A stated that *“Market share follows infrastructure, and it is evident that Bank A has a lower market share of lower income and rural segment customers nationally relative to Bank E. Where Bank E has 14 branches in a particular area, Bank A has 7. Bank A’s, 7 branches were built in the late 80s and 90s whereas Bank E was built in the last 10 years. So, they’re in different places also. So how your infrastructure as a bank supports your life is important, and if you can de-cash the economy then you also reduce how much infrastructure influences market share”*.

Chang & Dumont (2019), in their study discovered that banks are digitalising their operations and by embarking on their digital transformation journey banks are reducing their branch footprint and this has had unintended consequences on rural and low-income segment customers. Banking customers in the impacted regions report higher expenses and less convenience in obtaining financial services. These difficulties appear to be amplified for certain groups, including those with lesser incomes or less reliable mobility, as well as the elderly.

Consumers with bank accounts are increasingly using online and mobile banking, especially for basic services like viewing balances. Branches, on the other hand, remain a key banking channel for consumers, particularly for deposit and withdrawal operations and problem resolution. With the LSM 1-4 segment customers, the transition to digital channels is taking longer. This is especially true for people who are older, have lower incomes or less formal years of schooling, or live in rural areas (Chang & Dumont, 2019).

Some of the participants disagreed that digital product innovations are causing unintended consequences. The findings imply that components of the digital divide, particularly lack of infrastructure in rural areas (which speaks more to country issues), are inhibiting customers from using digital channels to obtain products and services. Participant 2 from Bank C. *No it is not driving unintended results, Connectivity is a hurdle; even though certain features are free on the, clients in remote places are unable to use it. This is more about the country's infrastructure problems.*

The findings suggest that banks have identified that this is an important segment for the banks and are introducing innovations that are relevant and meets the needs of customers. It seems that bankers at a branch level play an important role in driving awareness, educating and training customers on digital product innovations.

Participant 2 from Bank D: *“These innovations are not driving unintended results, for customers that cannot afford a smart phone, the bank has developed*

capabilities on USSD (cell-phone banking). Bankers are spending a lot of time educating and training this segment of customers to use digital channels”.

Considering the divergent and convergent views of the participants, it is evident from the findings that the introduction of digital product innovations does drive unintended consequences to the rural and low-income segment customers. This view point is shared by majority of the participants. It could be argued that the participants who have differing opinions are not as involved or as close to the ground or detail, further one can establish that their views are bias as they are looking at it from the banks persepective and not from the customers perspective.

In addition the findings show that trust does have an influence on the adoption of digital product innovations. Trust in digital banking, relates to customers' trust in a bank's ability, integrity, and goodwill in providing digital product innovations. Customers initial use of digital product innovations is affected when they have reduced trust in digital product innovations introduced by banks (Kim et al., 2009). Customers will feel secure knowing that their personal information is protected, as well as the security, safety, and integrity of their banking information and details. These are variables that are likely to influence their decision to adopt and use digital product innovations.

From the banks perspective this study findings illustrate (supporting block 5 of the conceptual framework, bank: unintended consequences), that the introduction of digital product innovations is driving unintended consequences.

The findings suggest that banks have experienced unintended consequences. There has been an influence on customer experience by introducing digital product innovations, such as customer resentment. Banks have also experienced duplication in costs. They have invested large sums of capital into digital channels, which customers are not using, branch infrastructure costs including human capital costs and have not seen a reduction in branch footfall. This is aligned to literature review in chapter 2. Banks, on the other hand, have yet to

realize the anticipated reduction in operating expenses because they are still struggling to migrate customers to digital banking channels (Kaur et al., 2020).

Participant 1 from Bank D stated that, “ *It does cause customer frustration and resentment. Branch has been successful in implementing the technology and onboarding customers; however, customers are insisting on coming into branch. This leads to duplication of efforts and costs. Customers can take up product on app but still come into branch. Introducing me to the digital tool does not equate to educating me on using the tool, need constant communication on the app, on how to use the app and what is the benefit*”.

It is ostensible from the above findings that this occurrence is happening at a national level and banks need to some how reverse these effects being experienced, the data suggests that proper digital solutions which is viable and meets the needs for this segment of customers be developed and introduced. The solutions need to be relevant and useful to customers. This is supported by a quote by participant 1 from Bank B, “*There has been some positives and negatives. We have seen a rise with the use of smart phone technology across all our consumer groups, but our digital adoption rates could be much higher. We are constantly looking at new ways of solutioning for this segment by looking at new services and functionality that can be implemented on the digital channels that will be suitable to this segment of customers*”.

In addition, awareness, education and training are key elements identified as part of increasing adoption and usage. The digital divide has come up numerous times as having a significant influence on the adoption and usage of digital product innovations. As per the findings, banks have identified that the digital divide is a major hinderance and are building and enhancing capabilities on feature phones, *which is a type or category of mobile phone that preserves the form factor of previous generations of mobile phones, including press-button controls and a small non-touch display*, which customers already have as to not force them to purchase a smart phone. Participant 1 from Bank A stated that, “*Digital product innovations is not driving unintended results, however the*

challenge is that there is a perception that Bank A is an expensive bank. Clients are then advised about the digital product innovations, and they are then excited about this. To financially include these customers data for the app has been zero-rated". Participant 3 from Bank B stated that, "Not at all, in most circumstances, it aids in the transfer of funds to loved ones. The cost of data continues to be an issue, as does general infrastructure associated to connectivity".

According to the participants in the study, their banks are developing solutions for this consumer segment. Participant 4 from Bank A stated that, *"Their bank has restructured segments, they are properly solving for this segment of customers ensuring that they are meeting their needs. More and more solutions being developed to help these clients"*. Participant 1 from Bank A stated that, *"Digital product innovations is not driving unintended results, however the challenge is that there is a perception that Bank A is an expensive bank. Clients are then advised about the digital product innovations, and they are then excited about this. To financially include these customers data for the app has been zero-rated"*.

The severity of unintended consequences for banks stems from the fact that they have invested extensively in digital product innovations and continue to do so. They built a one-size-fits-all solution for all customer segments, oblivious to the fact that these solutions do not fulfil the needs of the LSM1-4 customer base.

The research suggests that some banks have recognized this and are now introducing solutions tailored to this group of customers; however, this has come at a significant cost to banks in terms of 1) monetary costs associated with digital product innovation; 2) duplicate costs associated with customers still visiting branches; and 3) human capital costs associated with bankers spending more time assisting customers on transactions that could be completed via digital channels.

5.3.2 Conclusion of findings relating to proposition 2

Proposition 2 focused on the banks' digital transformation journey and if it has had any unintended consequences for customers in rural and low-income areas. According to the current study and literature reviews, digital product innovations introduced by banks to an extent contribute to financial exclusion and provide little value to rural and low-income clients because most of the solutions are designed for the upper income sector. Customers distrust self-service channels and prefer to be assisted by a human.

Participants have acknowledged that digital product innovations are causing unintended consequences, they were quick to respond that their banks have prioritized digitally solving for this segment of customers, ensuring that they are not left out as the banks continue their digital transformation journey.

Although there are differing perspectives on the unintended consequences of digital product innovations, banks have recognised this as a critical segment of their business and are developing and implementing solutions for this group of consumers.

The Financial Sector Conduct Authority (FSCA, 2021), in their research found that transactional banking is being redefined by technology. This is evidenced by the arrival of digital banks into the South African market, as well as established banks strengthening and expanding their electronic channel capabilities.

Major banking firms have reduced their physical branch network because of rising physical infrastructure costs, increased usage of alternative channels, and competition from digital-only branchless banks. While digitisation can help with financial inclusion, customers' willingness to use digital platforms to acquire financial services has not kept pace with banks' digitisation initiatives. "Some low-income clients may be hesitant to use online or telephone banking, given the tangible cost they confront in doing so," according to civil society feedback in the 2018 Retail Banking Diagnostic, as well as the cost of data or airtime to use these technological services." Another important factor to consider is that cash is still

the most common mode of payment in South Africa, necessitating the use of traditional physical distribution platforms such as the ATM network.

According to our findings, Customers' intention and behaviour to use digital product innovations may be influenced by decent in-branch engagement between branch personnel and customers. According to Yap et al. (2010), customers' adoption of digital product innovations is influenced by branch service quality by bankers creating awareness and educating customers on digital product innovations, this will develop customers' trust in e-banking services and adoption will increase. This is strongly aligned to our research findings were participant 2 from Bank B specified that *"They have created targets for sales consultants in branch which is measured in their year-end Performance discussion, with digital adoption and migration having the highest weighting as their KPI's"*. By banks driving digital adoption and migration in branch, this will have a positive influence on customers willingness to adopt digital product innovations.

To summarize, the outcomes of this study imply that increasing awareness, education, and training are critical aspects in mitigating unintended consequences brought by digital product innovations. It is reasonable to conclude that when new technologies are introduced, they elicit a certain amount of hostility, particularly when a person has a practice of doing specific behaviours. However, raising customer awareness, educating, and training them, and counselling them on the benefits makes it easier and more palatable, as well as gaining trust in the system. Customers become more enthused and use these technologies when they are aware of and familiar with them, according to the data, which is a favourable outcome for banks as well.

The approach to having these conversations with customers is critical for banks to improve adoption and usage of digital product innovations. Customers are being forced to adopt digital product innovations, according to this research findings. Forcing clients to adopt digital product innovations does not imply that they will use these solutions. As a result, awareness, education, and training are critical to achieving beneficial results.

5.4 Discussion pertaining to Proposition 3

Proposition 3: Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater financial inclusion and the provision of a wide range of additional financial services.

The third proposition explores the positive influence that digital product innovations may have on low-income and rural segment customers.

Participants were asked interview questions 13-14 and 17-20 to see if the adoption of digital product innovations resulted in positive outcomes envisioned by the banks for customers in the rural and low-income segments.

5.4.1 Intended positive results

Lin (2011), defined relative advantage as "the benefits of using a product or service," with convenience, ease of use, and cost among the benefits in the case of digital product innovation adoption.

The majority of participants stated that digital product innovations provide advantages such as banking at any time, saving time, banking anywhere, avoiding queues, and having financial control, which was consistent with other studies' outcomes. It appears that the more benefits digital product innovations provide, the higher the rate of adoption and utilisation.

From a customer perspective (relating it to the conceptual framework, block 4: intended positive outcomes), this study findings revealed that digital product innovations have a positive influence on the rural and low-income segment customers. It allows customers to save money, savings could come in the form of fewer trips to a traditional bank branch. Customers in rural areas value saving time and travel because their income is typically low, and their levels of affordability are poor. Furthermore, when digital product innovations are user-friendly, simple to use, and do not involve a lot of effort, they are more likely to be adopted, it is seen as a benefit and encourages customers to utilize it. In this

case, it provides benefits to the user, resulting in increased acceptance and utilization. Its offers:

- *Quality of life – more safe secure way to share money with family*
- *With the high level of rural urban migration, makes connectivity with family easier. Share more help into the rural areas*
- *Less time in queues*
- *More money is unlocked from peer 2 peer transfers*
- *More time at their convenience*
- *Unlocking more savings opportunity*
- *De-cashing an environment and making it safer*

Banks are certainly experiencing a metamorphosis. The shift away from cash and even cards, the rapid use of digital banking, and a growing interest in personal investing are all examples of how banking is changing. From this study findings the effects of this change can already be seen.

Participant 1 from Bank C responded that it has a: *“Positive influence, using USSD rural customers can purchase airtime whereas they would pay extra at a spaza shop for the same transaction. Customers can now send instant money, travel costs have reduced, created access to financial inclusion, it helps with clients being more responsible for the finances – customers can see what is happening on their accounts.”*

The study findings suggest that by providing convenient, faster, secure, and timely transactions and adapting to specific needs through customized products, digital product innovation and access to digital financial services may offer ways to overcome some of the barriers that prevent the low-income and rural segment customers from accessing and using financial services, such as physical infrastructure barriers or high costs. When delivered responsibly within a secure infrastructure, digital financial services can help the financial system and customers be more resilient during times of need.

Participant 2 from Bank D specified that *“It has a favourable influence; customers do not need to go into branch to do transfers, they have the ability to receive money from family and friends, creates financial inclusion and convenience”. He also added that customers have immediate access to money and are saving on transport costs, however stated that data costs are expensive, and customers have additional costs whereby they need to purchase a smart phone which is compatible to download the banking app”*.

The findings are supported by the literature review in Chapter 2 and other research. Khera et al. (2021), in their study found that digital product innovations have been a key driver of financial inclusion in recent years. Their main findings demonstrate that if traditional financial services are used often, digital financial inclusion is higher. Digital financial innovation demand (use) is higher in areas where people are more financially aware and have more faith in the financial system and as part of their literature review found that, several studies have also found that greater financial inclusion has a favourable influence on growth, poverty reduction, and inequality reduction.

Financial inclusion has a variety of effects on macroeconomic performance: for example, access to savings instruments helps household’s smooth consumption in the event of unforeseen shocks.

Participant from Bank E stated that: *“The biggest influence is, it gives is access. Access to banking services were there was none previously. If you think about the vast distances that people must travel to reach the closest town and you now have an app that is able to be a bank in your pocket it opens a new way of banking and potentially living because you also save time and money not having to travel so a banking app can change someone’s life. As well as there is now a time and a cost benefit to these customers”*.

Participant 3 from Bank A states that, *“Bringing customers into the banking world (financial inclusion), de-cashing the economy, opens them to new banking products and services, new payment methods for customers, creating a trusted*

environment, convenience for customer, change their lifestyle to better suite their needs, cost savings, unlocks more opportunities for customers, app now available on more phones due to size of app, trust in sense of security, improved convenience, digital experience has simplified complex banking, customers migrating from simple USSD to complex app, adoption of technologies, accessibility to customers, affordability, safety”.

There is limited literature to support the views for this research on whether the digital product innovations introduced by banks does have a positive influence on rural and low-income segment customers, however, there is literature on digital product innovations introduced by FinTech's to support this view, with Kenya's M-Pesa being one of the most effective examples of digital financial innovation accelerating financial inclusion.

To support the current research, Agolla & Makara (2018), in their study investigated the impact of banking innovations on customers and their findings revealed that there is a strong link between banking innovation and positive influence on customers which may stem from the fact that such innovative services have a significant impact on improving client convenience, efficiency, and prompt service. Furthermore, the study by (Jan & Abdullah, 2014), shows that when banks introduce digital product innovations, customer satisfaction is greatly improved, digital product innovations have been shown to have a strong positive impact on trust and trust on customer satisfaction.

Sharing similar findings from his research, Nelito (2018), found that digital banking offers the following benefits to rural and low-income segment customers:

- *Availability of financial services in rural areas*
- *Strengthens privacy and security for customers*
- *The ease of banking from the comfort of your own home*
- *Lowers the minting demands of currency (which speaks to de-cashing the economy*

According to this study findings, customers still prefer human interaction when making big decisions, such as taking out a loan or engaging in more complex financial operations. On the other hand, digital banking has been shown to be useful for normal banking activities. With time being such a critical factor for customers and services, the digitally aware customer will seek for personalized and seamless digital services that are available whenever they want them.

To support the views of the current research from a fintech perspective, Carter & Benami (2021), postulate, M-Pesa, which started as a mobile money service in Kenya in 2007, quickly spread banking and money transfers to remote rural areas where there were no traditional banks. M-Pesa is a well-known digital technology that has changed the way East African rural communities access financial services. Participant 3 from Bank A advised that *“digital product innovation creates financial inclusion and unlocks more opportunities for clients giving them access to additional banking products”*.

The findings from this study suggest that customers who have been onboarded and are utilising digital financial solutions are finding it useful and realising a financial savings. Digital solutions enables customers to execute their banking transactions more easily and provides them with more independence. They feel more empowered, confident, and positive as a result. The Worldbank (2014) report, concurs, in that accessing financial services can be made less expensive and inconvenient thanks to technological advancements. New technologies have proliferated in the preceding decade, allowing for substantial cost reductions in activities, resulting in greater financial inclusion.

It is worth noting that the findings of this study indicate that rural and low-income customers are adopting digital product innovations. It has resulted in customers realizing significant benefits. Many of the participants mentioned that connectivity is a barrier; even though some services on digital product innovations are free, customers in remote locations are unable to access them. This is more related to the country's infrastructure issues. South Africa can adopt best practices from

China, which launched and implemented a large-scale effort to provide internet connectivity to rural areas.

According to Kong & Loubere (2021), increased access to digital financial services would not have been possible without the massive increase of Internet connectivity in China's rural areas. This has paved the way for a rapid expansion of digital finance in China's rural market, while also addressing some of the country's most pressing concerns faced by traditional financial institutions.

It has, for instance, negated the need to build and operate physical outlets, that were expensive due to the lower population density and inadequate transportation infrastructure in rural China. Because transactions can be conducted in the cloud, using a mobile phone to provide services has significantly reduced transaction costs. It also saves institutions money by decreasing the need to invest in physical equipment. The ability to provide financial services digitally and at a low cost has had far-reaching consequences (Wang, et al., 2017).

From a banking perspective (supporting block 5: positive intended results for banks), the findings indicate that banks are realising benefits from the introduction of digital product innovations. Banks have observed a decrease in client attrition and an increase in client entrenchment and marketshare. Banks are able to better understand client behavior thanks to improved data collection, and they can customize solutions to their needs. Customers have taken advantage of additional products that they would not have been able to acquire otherwise.

Furthermore, the findings revealed that banks' client lifetime value, which is the entire value of a customer to a bank over the course of their relationship, has increased. It's a crucial step because keeping existing customers is less expensive than acquiring new ones, so boosting the value of your existing clients is a wonderful strategy to expand your business. As a result, you've seen an increase in profit before taxes and have seen a rise in revenue.

This view is supported by (Carter & Benami, 2021), mobile money systems, for example, have been shown to assist people handle shocks with remittances from family and friends in Kenya, Rwanda, and Tanzania. These methods also enable insurance firms to offer payouts to isolated families for losses in a timely and cost-effective manner. Previously, these payments were either late or never arrived. Furthermore, new credit scoring data sources may be able to level the playing field for borrowers by lowering the cost for businesses to assess creditworthiness.

The findings also revealed that there is increased adoption and usage of digital product innovations. A person who adds minutes to her phone on a regular basis, for example, is more likely to have the consistent income required to repay a debt. This type of metadata could be used by a lender to anticipate whether or not a borrower would make payments. According to a report from Tanzania, digital data analytics could result in a 40% reduction in loan costs. "This is an example of a so-called digital footprint that might assist broaden credit access and/or cut interest rates (Carter & Benami, 2021).

In summary, the findings from this study have also revealed that the introduction of digital product innovations has created improved customer experience and engagement. Allows banks to better understand client behavior and needs, enabling for better solutions and personalization. Condensed time to market for products and improved platform service engagements.

Banks have the capabilities to develop unique and creative ways of introducing products and services that fulfill consumer requirements more efficiently or inexpensively through the adoption and use of technology. The solutions can help banks save money by allowing them to deliver products and services more quickly and efficiently. Providing customers with the flexibility, convenience, and speed with which they can transact and interact with their bank.

The findings of the study include the availability of a structure for achieving and broadening efficacious access to rural areas in a nontraditional affordable way, identifying potential customers and providing highly customized banking

experiences in a comprehensive manner, including individualized risk analysis; ease of access to credible information in digital form with an approach to evaluate on a continuous basis; and accessibility of revolving credit lines.

5.4.2 Conclusion of findings relating to proposition 3

To conclude the feedback provided for P3, it is evident from the research and literature that there are convergent views on the influence of digital product innovations, in that digital product innovations have a significant influence by allowing for greater financial inclusion and the expansion of basic services.

The findings suggest using technological advancements to deliver financial services does pave the way for the supply and use of a wide range of additional financial services and products to those who were previously excluded, such as credit, insurance, savings, and financial education.

The research findings shows that digital product innovations positively influence rural and low-income segment customers by adding convenience, safety, creating excitement and transparency, customers are enjoying an enhanced quality of life, it creates financial inclusion, and this unlocks more opportunities for clients, banks have the ability to understand customer behaviour, gather data and offer solutions applicable to the customer. It meets customers social and technical needs; customers find it useful and once they become more conversant with these digital solutions, they find it easy to use.

Banks, understanding customer needs is a big part of providing for them in the first place. Customer feedback is critical, and technology may assist banks in doing so. Feedback can be collected via social media and other customer service methods.

5.5 Conclusion

To recap, summarise and conclude this chapter it is important to reiterate the propositions for this research study. Listed below are the three propositions:

5.5.1 Proposition 1

P1: Digital product innovations could partially produce the desired results, however, the level of achievement might be impacted by acceptance, adoption, usage, and cost savings, which is substantially influenced by the tiers of the digital divide, namely access, usage, and skills.

The researcher set out to gather information through a qualitative data approach to explore if the desired outcomes envisioned by banks is being achieved. The research results reveal that there was differing views from the participants with majority of the participants postulating that the digital product innovations introduced by banks is not resulting in the desired results envisioned by banks. The rural and low-income segment customers face various barriers in adopting and utilising digital product innovations, such as:

- *Lack of infrastructure in the rural areas*
- *Exorbitant data costs*
- *Language barrier*
- *Lack of literacy, digital and financial literacy*

Listed below are additional factors as to why the desired results are not being achieved:

- *Digital product innovations add no value to rural and low-income segment customers. When asked why this is the case, the participant responded that the designers are creating a one-size-fits-all solution without considering the needs of the lower LSM customers.*
- *Customers still coming into branch (digital adoption is not high). It was essential to understand why this is the case, the findings revealed that from a culture perspective the LSM 1-4 segment customers come into branch as they are searching for trust and security. The ability to have something reliable in their lives matters and transferring that element of trust from human to digital is not an easy thing.*

- *Digital product innovations are not user friendly and easy to use. When queried why this is the case? According to this study findings, these innovations are complicated to use. It took the participant a long time to understand and navigate the solutions despite being literate and having access to these innovations. According to the findings, banks that are witnessing a surge in digital adoption and usage are developing simple solutions that cater to rural and low-income customers.*
- *Aging book of banks (relates to the banks elder clients). The findings revealed that certain banks are failing to attract new customers compared to their competitors, and the digital solutions being introduced do not meet the needs of their existing clients. Banks must do a comprehensive inspection and possibly quit "copying their competitors" to do what is best for the bank, but most importantly, what is best for their clients.*

On a positive note, participants did allude that these digital product innovations are achieving the desired results envisioned by banks. There has been a significant decline in customer attrition when customers adopt digital product innovations, more customers are being digitized and are realising tremendous value from these digital product innovations. There has also been a momentous migration from bricks and mortar channel to digital channels. Listed below are additional perspectives on the desired results being achieved such as:

- *Reduction in cost base*
- *Increase in profit before tax*
- *Increase in market-share*
- *Bankers have more face time with customers who come in for more complex transactions*
- *Banks are using customer data to understand customer behaviour and provide appropriate solutions*
- *Customers adopting and utilising digital solutions, and this confirms that the solutions being designed are meeting customer needs.*

5.5.2 Proposition 2

P2: The introduction of digital product innovations could result in unintended consequences.

The researcher wanted to explore the nature and extent of adoption of digital product innovations by rural and lower income segments and if this has resulted in unintended results experienced by the customer. The participants were quite vocal in their responses and stated that the introduction of digital product innovations has resulted in unintended consequences for rural and low-income segment customers. The participants stated that digital product innovations caused financial exclusion as clients were forced to comply with the adoption of digital product innovations, as a result customers felt intimidated by banks. It has also created angst for customers who still want that human interface.

This customer segment is cash intensive, and many of the solutions provided do not match customer needs or customers do not suite the profile. Furthermore, banks are experiencing duplication in costs. Customers are still coming into branches for transactions that they might easily do through digital channels, despite bankers training them to embrace digital technologies.

5.5.3 Proposition 3

P3: Customers in the rural and low-income segments may benefit from digital product innovations, by enabling greater financial inclusion and the provision of a wide range of additional financial services.

From the standpoint of the participants, the low-income and rural segment customer base is vital to the banks, and they are ensuring that they are providing digital solutions for this segment of users. One of the interview questions posed to participants, was enquiring what digital product innovations are being introduced by banks and to what extent does this apply to the low-income and rural segment customers. The participants were well versed on this and were quick to respond. To adequately explore *P3*, the researcher wanted to know how

these digital product innovations influenced this customer segment. It provides convenience, security, enhanced quality of life, financial inclusion, and hence unlocked additional opportunities for customers, according to the participants. As customers gain more familiarity and comfort with digital solutions, these become easier to use and more useful. Banks can understand client behaviour, acquire data, and offer more appropriate products and services as customers use digital product innovations.

To corroborate the current research findings a report by Financial Sector Conduct Authority (FSCA, 2021), South Africa's financial sector is a vital part of the country's economy. The sector is critical in facilitating ordinary South Africans' engagement in the broader economy, in addition to its macroeconomic importance. Over the last two decades, the landscape of financial service providing in South Africa has altered dramatically. The industry is becoming more sophisticated, well-regulated, and stable, having weathered catastrophes such as the 2008 financial crisis and securely managing the effects of bank closures. The industry has provided access to a variety of financial goods and services that aim to help South Africans manage their money, prepare for the future, and cope with financial demands and strains through a vast physical and digital network. The introduction of digital channels has aided in broadening access to the sector and increasing the efficiency with which financial services are delivered.

5.6 Summary

Considering the net effect based on the positive and negative outcomes. Although there have been some negative customer experiences, there are those customers who have adopted and utilising digital product innovations and are deriving tremendous benefits. It is true that banks need to do a lot more to comprehend the LSM 1- 4 customer base. According to the findings of the study, some banks have recognized that the solutions they have introduced do not suit the needs of this customer segment and are providing appropriate solutions for them.

If all banks go back to basics and undertake a thorough need analysis, they will be able to deploy appropriate solutions the first time around. Banks that have introduced the appropriate solutions are realising the desired outcomes and realising the positive intended results. Banks need to continue evolving on the digital transformation journey and ensure that they are solving and solutioning for all customer segments.

The findings also revealed in branches where there is inadequate customer awareness, education and training, banks are not seeing the digital adoption and usage and as a result is causing customer alienation, resentment, and dissatisfaction relative to where this is happening and the findings support this, evidencing the high adoption and utilisation numbers in Banks E and A.

From this study findings and other studies, it is apparent that the introduction of digital product innovations by banks does positively influence the lives of the rural and low-income customer segment.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

Over the last two decades, the landscape of the banking sector in South Africa has been altered dramatically. The industry is becoming more sophisticated, well-regulated, and stable, having weathered catastrophes such as the 2008 financial crisis and securely managing the effects of bank closures. The industry has provided access to a variety of financial goods and services that aim to help South Africans manage their money, prepare for the future, and cope with financial demands and strains through a vast physical and digital network (FSCA, 2021).

The fundamental findings from the research interviews along with the literature review will be integrated into the objectives described in Chapter 1, with each objective being addressed in this chapter. The study's major objective is to explore the influence of digital transformation on low-income, rural customers in large South African banks, which is further subdivided into the following sub-objectives:

1. To explore whether digital product innovations introduced by banks as part of their digital transformation journey is achieving the desired results
2. To explore whether the introduction of digital product innovations drives any unintended results
3. To explore the positive influence digital product innovations may have on the rural/low-income segment's customers

Following that, recommendations will be made for each of the propositions that were explored during the data collection interviews.

6.2 Conclusions regarding research objective 1

Research sub-objective 1 explored whether the digital product innovations introduced by banks as part of their digital transformation journey is achieving the desired results.

Through the findings presented in this study, participants expressed varied views about whether the introduction of digital product innovations to rural and low-income segment customers had yielded the expected benefits.

It was discovered that client knowledge, awareness, relevance, usefulness, ease of use, and/or relevant information communicated are all important factors in the acceptance and application of digital product innovations. Participants also said that rural and urban areas had different adoption and usage rates for various items and services, with rural areas having lower adoption rates than urban locations.

Customers are occasionally aware of a variety of digital products and services but do not intend to utilize them, while others are utterly uninformed of their existence. Furthermore, it was found that this segment of customers is heavily reliant on cash and that they face numerous challenges in adopting digital product innovations, such as insufficient infrastructure, high data costs, high electricity costs, literacy and language barriers, connectivity issues, and the aging customer book of banks. These views are strongly aligned to the literature reviews described in chapter 5.

The findings also show that, despite several hurdles, banks are achieving the desired results to some extent, albeit not at the rate they had planned for. The implementation of digital product innovations is working as there has been a significant migration from the traditional bricks and mortar branches to digital channels. Banks are seeing a cost reduction and an increase in profit before tax. There has been a tremendous reduction in client attrition, customers are becoming more entrenched in the banking eco-system. Banks are using data to understand customer behaviour and are thus able to provide appropriate

solutions to customers. These findings are strongly aligned to the literature review described in chapter 5.

In conclusion the researcher is of the view that despite the negative views, there is adoption of digital product innovations by this segment of customers. Furthermore, branch bankers have an immense role in creating awareness, educating and training customers on digital product innovations. This is supported by a response from participant 2 from Bank B *“We have created targets for our sales consultants which is measured in their year-end performance discussion, digital adoption has the highest weighting in their KPI’s”*.

The study adds to the literature by:

- 1) Illustrating that in-branch efforts by bankers perhaps plays the biggest role in getting this segment of customers to use digital product innovations”.
- 2) Spazas and small businesses in rural areas only accept cash, creating a barrier for customers who want to use digital product innovations like card payments.

6.3 Conclusions regarding research objective 2

Research sub-objective 2 explored whether the introduction of digital product innovations caused any unintended results.

The findings from this research revealed differing views. The majority of the participants agreed that digital product innovations have resulted in unintended consequences for customers. One participant had strong feelings about this, claiming that it is promoting financial exclusion, forcing customers to adopt digital solutions and making people feel intimidated by banks. Customers prefer that human interaction, this segment of customers utilize cash a lot, and digital solutions offer little value to them, according to the other participants.

Some of the participants did state that it is not driving unintended results, their banks are developing solutions for this customer segment, by ensuring they understand their needs and providing proper solutions. The use of smart phone

technology has increased throughout all customer segments, but the digital adoption rates could be considerably higher. They are always searching for innovative ways to solve problems for this segment, such as new services and features that can be delivered via digital channels and tailored to this segment of customers.

The views shared on the unintended outcomes of this study's research findings are consistent with those of other academic studies, however there is no academic literature to support the views, that digital product innovations are not driving unintended results and banks have identified this as a crucial segment of their business and are creating and implementing solutions that are applicable for this segment of customers.

This study adds to the literature by highlighting that, rural and low-income customers are slowly accepting bank-introduced digital product innovations, but there is a larger issue in the shape of infrastructural concerns, which speaks more to macroeconomic challenges in South Africa. South African banks and the government must collaborate to guarantee that this sector of the population is included in the financial eco-system.

As banks embark on their digital transformation, this segment of the population should not be left out. Banks are developing and implementing solutions for this segment of customers, but what is the government doing to ensure that the necessary infrastructure and technologies are in place to enable these capabilities and innovations?

The South African Government could adopt a similar initiative being deployed by India call Digital India. Digital India is a government-led program that intends to improve online infrastructure and Internet connectivity, as well as make the country more technologically proficient, to make government services more accessible to citizens. 'Power to Empower' is the main goal of the Digital India Mission. Digital service delivery, digital infrastructure development, and digital

literacy are the three main components of Digital India Initiatives (GovtIndia, 2019). For the country and its economic progress, this will be a disruptive force.

To conclude proposition 2, the findings offer significant insight on the unintended results of digital transformation. This feedback is key for banks in the deployment of digital product innovations to the rural and low-income segment customers. Banks must ensure that these digital product innovations deliver on their promises to these customers. It is imperative for banks to collaborate with government to ensure that the necessary infrastructure is available to support digital product innovations and in turn drive financial inclusion.

6.4 Conclusions regarding research objective 3

Research sub-objective 3 explored the positive influence digital product innovations may have on the rural/low-income segment's customers.

The findings provide important insight into commercial banks' perspectives, particularly when introducing innovative technologies to attract, gratify, and retain customers in a rapidly changing and competitive environment. It is obvious from the findings that the digital product innovations used by banks have had a positive influence on customers.

It offers a definitive level of convenience, safety, savings in bank and transportation fees, customers are finding it useful and easy to use. It creates financial inclusion, the more comfortable and familiar customers become with the platform, digital usage increases. The banks are then able to understand customer behaviour from the data collected and can provide appropriate and bespoke solutions for these customers. When awareness and training is provided to customers on ease of use and usefulness of digital product innovations, it creates excitement. These findings are consistent with those of literature reviewed.

The study's conclusion underlines the importance of using innovative strategies to increase major banks' market share, which leads to enhanced competitive

performance. The study also provides information that the introduction of digital product innovations does have a positive influence on customer attraction, satisfaction, and entrenchment.

6.5 Recommendations

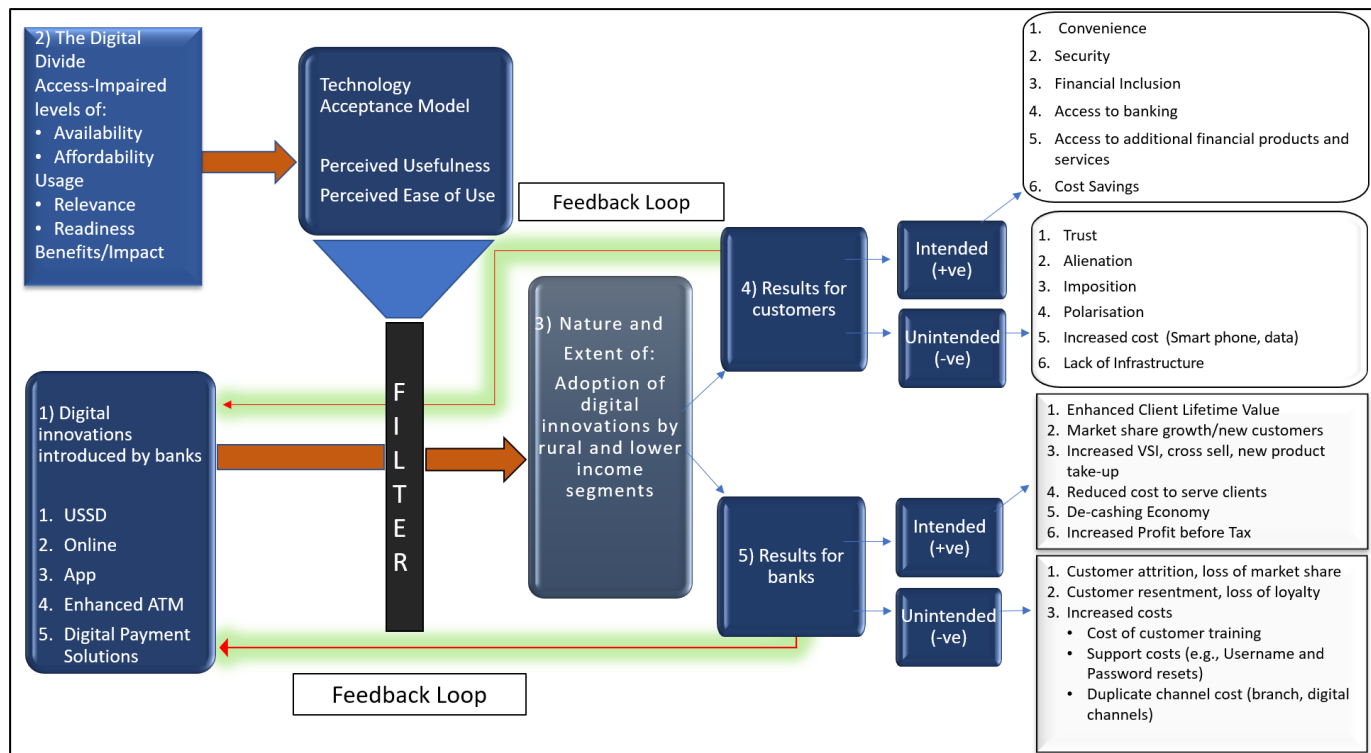


Figure 25: Revised Conceptual Framework including feedback loops

The revised framework presented in figure 26, shows feedback loops from the intended and unintended results from a customer and banks perspective back to the banks. The feedback loops will provide valuable insights to banks to better align digital product innovations with customers real needs, in the context of rural and low-income segment customers.

Banks can implement feedback loops and will be able to pinpoint issues and gain insights that can help develop strategies and solutions to enhance products, processes, and services. Banks will be able to conduct a deep dive into customer feedback to better understand their needs, resulting in lower customer attrition and an increase in digital product innovation adoption.

The study's findings provide valuable insights to banks to help understand the important aspects that influence digital product innovation adoption and usage as well as if the digital product innovations are delivering the desired outcomes intended by banks; are these digital product innovations driving any unintended results and what influence it has on customers and the banks.

What do the findings from a customer perspective tell banks about their innovations?

The findings are also practically useful. From a practical standpoint, the findings of the study can help banking institutions develop ways to increase the adoption and usage of digital product innovations through the feedback loops.

One of the most notable findings of this study is the importance placed on customer experiences and the shifting role of traditional bricks and mortar branches in encouraging clients to use digital channels for future banking transactions. Banks could launch tailored marketing and communication initiatives to educate low-income and rural segment customers on the benefits of digital product innovations, hence increasing take - up among existing and potential clients.

The research findings could aid banks in focusing their digital transformation journey on increasing trust in digital product innovations. Banks may engage on initiatives to strengthen and deploy security protections in order to increase trust in digital technologies. Customer awareness must increase, and technical support must be provided, in order to boost consumer confidence and attract new consumers to these solutions. Customers must comprehend the value proposition of digital product innovations, which can only be accomplished if banks utilize their branch bankers to drive change. While traditional marketing materials may be valuable, there is still a need for face-to-face interaction to gain people's trust.

Due to the lack of understanding being a barrier to adoption, there is a need for education that places emphasizes on the benefits of digital product innovations.

This will be especially advantageous to rural and low-income segment customers who are wary about digital product innovations. They would learn about the cost savings that come with not having to drive large distances to traditional bank locations through education. Through education, customers would learn about the cost savings that come with not having to travel long distances to traditional bank branches.

From the perspective of the banks, what does the findings tell banks? Digitalisation allows banks to explore and implement horizon 3 and blue ocean strategies to increase market penetration/market share, explore new markets, develop new products, and diversify its business. For banks to achieve these strategies it is imperative for them to gain insight and receive feedback on whether the digital product innovations being introducing is achieving the desired outcomes, if not what can they do to improve on these. The feedback loops show banks that some of their solutions are not working, why it is not working and what they can do to improve this.

6.6 Suggestions for further research

The study adds to the literature by demonstrating that the introduction of digital product innovations as part of the banks digital transformation journey does have a positive influence on rural and low-income customers to a large extent; however, the unintended consequences are largely attributed to South Africa's macroeconomic challenges and to a lesser extent, the banks. The study does have limitations that can be addressed by future research.

The current study only explores the perspectives of bank executives' views on the influence of digital transformation on low-income, rural customers in the large South African Banks. Customers' perspectives on the influence of digital transformation on them has not been studied and would be useful to explore further in future studies.

Furthermore, the findings of this study might be utilized to develop a model to explore the effects of branch bankers' activities on customer uptake of digital product innovations.

Future research could be undertaken to explore the impact of digital transformation on traditional bricks and mortar branches in rural areas and on its employees.

A fascinating topic to research would be the influence of digital product innovations on Small Medium Enterprise (SME) businesses in rural and township areas. One of the reasons for customers in rural areas being cash-intensive, according to this research findings, is because businesses, such as spazas and small businesses in rural areas are cash-only accepting businesses.

The digital divide and the factors that inhibit adoption of digital technologies were major findings in the research study; one factor, infrastructural issues, was a common thread mentioned by most of the participants; this factor creates a significant barrier in the adoption of digital product innovations because connectivity remains a major issue. Future studies could explore South African government's plans to provide cost-effective infrastructure in rural areas.

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CHAPTER 8. APPENDICES

8.1 APPENDIX A: Information sheet for respondents

Dear Participant,

My name is Chandika Aruthkumar, and I am a student at the Wits Business School, completing a Master's degree in Digital Business. For completion of my degree, I am expected to complete a research project. My selected project relates to an evaluation of "The influence of digital transformation on low-income, rural customers of large South African banks"

As part of this project, I'd like to invite you to participate in an interview. This activity will involve answering a set of questions via a Microsoft Teams' interview.

- You will not receive any direct benefits from participating in this research, and there is no disadvantages or penalties for not participating
- You may withdraw at any time and not answer any question should you not want to
- The data collected from this interview will remain confidential and anonymous
- The information you give me will be held securely and not disclosed to anyone else.
- If you experience any distress or discomfort at any point in this process, you can stop the interview participation completely or resume at another time convenient to you.

If you have any questions during or afterwards, please get in touch with me.

This study will be written up as a research report which will be available online through the university library website. If you have any concerns or complaints regarding ethical procedures of this study, you are welcome to contact the university: Human Research Ethics on 011 717 1408.

Your Sincerely,

Chandika Aruthkumar

8.2 Appendix B: Consent Form

Consent Form

Title of project: The influence of digital transformation on low-income, rural customers of large South African banks

Name of researcher: Chandika Aruthkumar

I, ..., agree to participate in this research project. The research has been explained to me and I understand what my participation will involve. I agree to the following:

(Please place a tick/cross for the relevant options below).

I agree that my participation will remain ☐ YES ☐ NO
anonymous

I agree that the interview may be ☐ YES ☐ NO
recorded

I agree that the information I provide may ☐ YES ☐ NO
be used anonymously after this project
has ended, for academic purposes by
other researchers, subject to their own
ethics clearance being obtained.

..... (signature) (name of participant) (date)

.....(signature).....(name of person seeking consent)
.....(date)

8.3 APPENDIX (C) Instrument: Interview Guide

Definition of terms:

➤ Rural

We define “rural” as representing all locations outside of the following:

Metropolitan areas

Large towns

Towns

Specifically, based on data from Stats SA 2016 census we define these as follows:

Metros

City of Johannesburg Metro	eThekweni Metro	Emfuleni Local Municipality
City of Cape Town Metro	Ekurhuleni Metro	Mangaung Metro
City of Tshwane Metro	Nelson Mandela Bay Metro	Buffalo City Metro

Larger Towns

Stellenbosch	Pietermaritzburg	Hermanus
Polokwane	Paarl	Knysna
Rustenburg	Kimberley	George

Towns

Nelspruit	Klerksdorp	Louis Trichardt
Krugersdorp	eMalahleni	Randfontein
Welkom	Tzaneen	Richards Bay
Secunda	Mahikeng	Potchefstroom
Malamulele	Mokopane	Mthatha
Newcastle	Middelburg	Ladysmith
KwaDukuza	Sasolburg	Phalaborwa
Port Shepstone	Kroonstad	Estcourt
Carletonville	Ermelo	Vryheid
Heidelberg	Parys	Jeffreys Bay
Meyerton	Malmesbury	Hoedspruit
Bethlehem	Ulundi	Upington
Grahamstown	Brits	eMpumalanga
Plettenberg Bay	Thohoyandou	Siyabuswa
Port Alfred	Apel	Mandeni

- Urban: 66% of South Africa's total population lives in urban areas and cities. Urbanization defines the share of urban population from the total population of a country.

In this report *Urban* areas are defined as those represented by the metros, larger town and towns as defined above.

- Low Income

In this report *Low Income* customers are defined as those falling in the LSM 1 to 4 segments, as defined below.

- Living Standards Measure: The tool divides the population into LSM groups where ten is the highest level for those with the most wealth and one is the lowest level of the poorest population who own no measurable wealth. The LSM tool groups people according to a standard of living wealth measure, rather than income, using criteria such as degree of urbanization and ownership of cars and major appliances or assets, as well as access to basic services such as water and electricity as indicators.

LSM 1 – 4 – least access to wealth

- Primary to some high school completed.
- Mostly Urban or Rural (i.e., not suburban).
- Household is traditional hut to matchbox house or shack.
- Salary ranges from R1,363 to R3,138 per month (approximately US \$85 - \$200).
- Media: Commercial radio is a major channel of communication with African Languages Services (ALS), TV with minimal channels, and minimal outdoor life.
- General: Minimal access to services, minimal ownership of durables except radio sets and stoves, low income transactional “Mzansi” bank account, minimal participation in economic activities, some electricity, hot plates, water on plot or communal, non-flush toilet, TV sets. Activities: Attend gatherings, go to night clubs.

LSM 5 – 7

- High school and/or some higher education.
- Mostly Urban or Rural (i.e., not suburban).
- Salary ranges from R4,165 to R11,263 per month (approximately US \$260 - \$700)
- Media: Commercial radio mainly ALS to wide range of commercial and community radio, TV with few channels, community TV, all print, daily or weekly newspapers, access to internet, magazines, cinemas, low income transactional “Mzansi” bank account, and outdoor life.
- General: Has electricity, water, flush toilet, TV set, hi-fi or radio set, stove, fridge, ownership of number of durables plus cellphone, can purchase take-away food, lottery tickets. Level 7 full access to services, increased ownership of durables plus motor vehicle, and participation in all economic activities.

LSM 8 – 10 – most access to wealth

- High school and higher schooling.
- Mostly Urban and Suburban.
- Salary ranges from R13,210 to R32,521 per month (approximately US \$825 - \$2,000).
- Media: Wide range of commercial and community radio, wide range of TV channels, daily or weekly newspapers, magazines, accessed internet, cinema and outdoor life.
- General: Full access to services and bank accounts, full ownership of durables such as cars, furniture, and appliances; participation in any leisure activities of interest and access to all economic activities.

Interview Question 1: What digital product innovations has your bank introduced in terms of a) product; and b) customer engagement and experience?

Interview Question 2: What are the digital services or functions a customer can perform or use digital channels for?

Question 3: To what extent do these apply to the rural and lower-income segment clients (LSM 1-4; 5-6)?

Interview Question 4: What is the intention of these digital product innovations?

Interview Question 5: What is your client base and what percentage of clients utilise digital products and services?

Interview Question 6: What activities are conducted using digital services and channels?

Interview Question 7: Are these digital product innovations achieving the desired results we discussed earlier (in Question 4)? If not, why not? What is working and what isn't?

Interview Question 8: What is your percentage of the market share of clients in the low-income rural segment (LSM 1-4; 5-6)?

Interview Question 9: What is your client base in the lower segment?

Question 10: What products and services do your customers in low-income and rural segments use?

Interview Question 11: What is the adoption/acceptance, activation and usage levels of digital products and services by customers in the lower income and rural segment?

Interview Question 12: What digital activities are conducted by the lower income and rural segment customers?

Interview Question 13: What influence does digital transformation have on the rural and low-income segment's customers (and prospective customers)?

Interview Question 14: How have customers in this segment benefited from the implementation of digital solutions?

Interview Question 15: Are these digital product innovations driving any unintended results in the rural and lower-income segment? If yes, what is your organisation doing

to ensure that this segment of customers is digitally included in the organisation's solutions?

Interview Question 16: Has there been customer resentment by implementing digital services or products?

Interview Question 17: Are these digital solutions welcomed by customers in this segment?

Interview Question 18: Do customers in this segment find these digital solutions useful?

Interview Question 19: Do customers in this segment find it easy to use these digital solutions?

Interview Question 20: Is customer lifetime value enhanced by introducing digital solutions in this segment?