

An evaluation of the inhibitions caused by legacy systems on digital transformation in a South African retail bank

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ABSTRACT

This research report investigates the inhibitions imposed by legacy systems on digital transformation strategies. The study focuses on the traditional retail bank, as these institutions contain traditional core systems that are complex to maintain and to replace. Moreover, the legacy can also be seen in business models that have previously been successful and are being disrupted by digital technology.

The existing theory uncovers that transforming organisations ought to develop enabling capabilities to support digital transformation. It specifies that implementing new technology is not sufficient to successfully implement the strategies and gain a competitive advantage. The challenge that traditional banks are faced with is the navigation of archaic systems whilst driving innovation.

Qualitative research in the form of semi-structured interviews with senior management was conducted. The population of the study comprises all employees of the Retail division of Bank X, South Africa. The sample was selected based on seniority as well as exposure to digital strategy formulation and implementation in the bank.

The study found that there are gaps in the understanding of digital transformation within the bank. This disconnect permeates the implementation of the strategy and creates silos in execution. It was also found that the digital transformation strategy needs to be supported by skilled personnel, an enabling culture, a sound operating model, and modernisation mechanisms to deal with the current system architecture. These capabilities are on varying levels of maturity in the bank and have a direct impact on the implementation of the digital transformation strategy.

A number of challenges were highlighted in the study relative to the research questions. To address the emerging challenges, six recommendations were made, namely defining digital transformation in the context of the organisation, clarification on the leadership of digital agenda, upskilling of the employees with digital skills, development of an architectural strategy that supports the digital strategy and investing in decision support tools to derive value from the data assets.

KEY WORDS

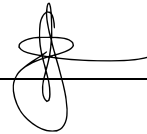
Digital transformation strategy, digitisation, digital strategy, legacy systems, core systems, banking industry

DECLARATION

I, Lukhanyiso Mantyi, 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: Lukhanyiso Mantyi

Signature:

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke, positioned above a horizontal line.

Signed at **Wits Business School**

On the **26th** day of **October 2020**

DEDICATION

To my late grandmother, Lili Nolungile Mgwabane, you continue to inspire me even though you're no longer with us.

ACKNOWLEDGEMENTS

To my mother, Thembela Mantyi, thank you for being a support structure throughout this process. I appreciate you.

To my sisters, Lumka and Zintle, thank you. The constant reassurance and cheering me on does not go unnoticed.

A special thank you to my friends and colleagues, I appreciate your words of encouragement.

To my classmates, you made this journey memorable; see you on stage!

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LIST OF ACRONYMS & ABBREVIATIONS

Table 1: List of acronyms & abbreviations

ACRONYM	DESCRIPTION
API	Application programming interface
BU	Business Unit
CEO	Chief Executive Officer
CDO	Chief Digital Officer
CIO	Chief Information Officer
CTO	Chief Technology Officer
IT	Information Technology
IS	Information Systems
RBB	Retail and Business Banking

CHAPTER 1. INTRODUCTION

This chapter offers an outline of what this study aims to achieve, and why it is of significance. It provides a context for the research problem being solved, the delimitations of the study are described, and the key terminology used in this study is provided.

1.1 The purpose of the study

The aim of the study is to explore the phenomenon of digital transformation in a traditional bank with an existing legacy. The approach to the study is two-fold, firstly to examine how digital transformation strategies are formulated and implemented. Secondly, to investigate how legacy systems impede digital transformation strategies. This research is a case study on one of the big four banks in South Africa that is currently undergoing digital transformation.

1.2 Context of the study

As the penetration of smart phones and technology continues to impact how consumers interact with products, and subsequently the type of services expected from organisations, banking institutions, hereafter referred to as banks, are finding themselves in the centre of this disruption (Gigov & Poposka, 2017). The South African competitive landscape is evolving; and customer needs and preferences are changing rapidly. Banks were amongst the first organisations to introduce technology into their processes by implementing mainframe computers for financial data (Davies, 2019).

As technology evolved, these now slower systems are not as agile and integration to newer technology is sometimes a challenge. To remain competitive in this digital era, banks are investing in technological solutions to streamline processes and enable functionality online. This transformation of the banking industry is complex, costly and poses operational risks to the institutions if it is not done correctly (Davies, 2019).

The digital transformation challenge in traditional banks lies in the management of traditional core systems, which are inflexible and costly to maintain (Sebastian, Ross, Beath, Mocker, Moloney & Fonstad, 2017). Banks cannot decommission all legacy systems overnight; as that would be a costly and complex exercise. The digital transformation has also influenced how customers interact with the banks. Previously this was done predominantly through the branch network, but banks are enabling more transactions online and consequently, the reliance on bank branches has reduced (Sonono & Ortstad, 2017).

Unlike the new rivals, the four South African big banks have the advantage of having a sizeable share of the bank market. In order to maintain this advantage, they will need to find efficiencies in their legacy businesses to fund the digital transformation that is required (Camarate & Brinckmann, 2017).

The emergence of new and somewhat unexpected players in the financial-service industry has exacerbated this challenge and it has created what was previously termed a 'marketplace without boundaries' (Camarate & Brinckmann, 2017). The industry has been largely protected by the high entry barriers, however, these have been lowered due to the granting of banking licences to new players.

The changing consumer needs, coupled with the new industry players, are leaving the incumbent banks without any option, but to transform digitally. Cuesta, Ruesta, Tuesta, & Urbiola (2015) proposed that banks must transform the way they operate, in order to be able to respond to the changing needs of customers, and to remain competitive. According to PwC, the four traditional banks: Barclays Africa (now Absa), Standard Bank, Nedbank and FirstRand, are finding new ways to transform, in order to remain relevant (Camarate & Brinckmann, 2017).

Digital transformation facilitates the three key pillars of change, namely: customer experience, operational processes and business processes. The success of digital transformation strategies is not merely about implementing new technologies; it also involves transforming organisational processes, in order to improve profitability and to increase competitive advantage (Kerschberg, 2017).

The availability of information is pivotal for digital transformation in organisations. Previously, organisations were limited by information scarcity, and sometimes time-lapsed insights, which impacted on the quality of the decisions made. Big data create opportunities for the profusion of information, and they open up a whole new approach to digital strategy and the digitisation of products and services (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013).

Digital transformation is largely spoken about in the professional context, and as such, there are numerous non-academic studies written about the envisaged impact of this phenomenon (Reis, Amorim, Melão, & Matos, 2018). However, academic literature on this subject is still in its infancy stage. Of more significance, most of the studies on this subject focus on the developed countries.

1.3 The research problem

Digital transformation presents a new challenge for the traditional banks that previously dominated the industry. The mainframe technology that enabled the industry is becoming inflexible and costly to maintain. The new 'Fintech' players in the industry, who are entering this market are leveraging newer digital technology to service customer needs at a lower cost. These challenges are promulgated by lower switching costs between banks, thereby resulting in customer attrition and a shrinking market share for some of the banks (Sonono & Ortstad, 2017).

The traditional banking model relied on a large branch network, which has been used to service customers on a face-to-face basis. As customers adopt digital alternatives, the foot traffic to the 'brick-and-mortar' bank is reducing. This shift requires banks to rethink banking in the traditional sense, and to formulate new strategies to compete in a transforming economy. The research problem is summarised below:

1.3.1 *The main problem*

To critically evaluate digital transformation in a South African retail bank, and how legacy systems inhibit the digital transformation strategy.

1.3.2 Sub-problem 1

To evaluate the digital transformation-strategy formulation and the implementation process in a traditional South African bank.

1.3.3 Sub-problem 2

To critically evaluate how legacy systems inhibit digital transformation in traditional banks.

1.4 Research questions

1. How do traditional banks formulate digital transformation strategies?
2. How do traditional banks implement digital transformation strategies?
3. How do the traditional banks manage the inhibitions caused by legacy systems on their digital transformation strategies?

1.5 Significance of the study

While digital transformation literature is still developing, a significant increase in literature has been noted since 2014 (Reis et al., 2018). There is currently limited significant research addressing digital transformation of South African traditional retail banks and their ability to manage the challenge to their legacy system. This study will add to the local body of knowledge.

There are studies that examine how organisations formulate and implement transformation strategies (Chanas (2017); Ismail, Khater, & Zaki (2017); Loonam, Eaves, Kumar, & Parry (2018). Other scholars have looked at digitisation in the banking industry (Cuesta, Ruesta, Tuesta, & Urbiola (2015); Schmidt, Drews, & Schirmer (2017); Sia, Soh, & Weill (2016); Sonono & Ortstad (2017).

The existing literature examines the legacy system challenge in organisations, and how companies looking to transform are evolving their systems, or running two IT modes (Haffke, Kalgovas, & Benlian, 2017; Sebastian et al., 2017).

However, no study to date has investigated this phenomenon in the banking industry in South Africa.

Therefore, this study is critical as it aims to assist bank leadership in understanding how the existing infrastructure impacts the digital transformation and how this challenge can be managed to maintain a competitive advantage. When it comes to wider significance, this study will contribute to the debate on this subject; and it will provide insight into how banks manage this dilemma.

1.6 Delimitations of the study

1. This research looks at digital transformation and the impact of legacy systems, from the perspective of business leadership, rather than IT. Therefore, the approach is understanding how the legacy impacts the product-house businesses, rather than the technicalities of legacy systems.
2. The study investigates the factors contributing to strategy formulation; but it does not postulate in-depth processes that are related to strategy formulation. It is a high-level account of the key activities involved when compiling a digital strategy.
3. The study follows a case-study approach; and it will focus on one large traditional bank in South Africa; as it embodies the complexities posed by legacy systems. The incumbent bank merged with other banks, which have contributed to the challenges.
4. This study does not include other divisions of the bank, such as corporate and investment banks (CIB), wealth and insurance.
5. New digital banks that have entered the South African banking industry are not in the scope for this study. Traditional retail banks have a unique challenge posed by aged architecture and traditional business models, which are not applicable to the newer players.
6. The study does not include other South African banks, or banks in other countries. It focuses solely on the banking industry and does not include other sectors.

1.7 Definition of terms

Table 2: Definition of terms

Term	Description
Researcher	This term refers to the student conducting the research
Bimodal / two-speed IT	Bimodal IT also referred to as two-speed IT; refers to an architecture of segregated platform domains, where one domain is managed for fast-paced agile delivery (Mode 2); and the other is managed for back-end system integrity (Haffke, Kalgovas, & Benlian, 2017).
Digital transformation strategy	Digital strategy is defined as an organisational strategy that is formulated and implemented by leveraging digital resources, in order to create competitive advantage (Bharadwaj et al., 2013)
Legacy systems	Legacy systems refer to technology that may be based on outdated patterns but is critical for business continuity (Crotty & Horrocks, 2016).

1.8 Assumptions

The following assumptions have been made regarding this study:

1. It is assumed that the respondents will share accurate insights on their experience as business leaders in a digitally transforming organisation.
2. Should a respondent not wish to divulge certain information, due to sensitivity or other considerations, this matter will be raised.

1.9 Chapter outline

Chapter 1 of this report presents the purpose of the study, the context of the research, the research problem and the objectives thereof, the significance of the study, and what will not be covered. The chapter also defines the terms used in the report and the assumptions made regarding this study.

In Chapter 2, the theoretical review is presented, and the concepts of digital transformation and legacy systems are defined. Previous studies by other scholars are reviewed on digital transformation-strategy formulation and implementation, as well as digital transformation in banking. The chapter also reviews the previous literature on the bimodal approach to digital transformation.

The challenges of implementing digital strategies, as well as managing legacy systems, are discussed.

Chapter 3 details the process followed to conduct the research. The research approach, the research design, the data-collection methods, the population and the sample, as well as the research instrument, are discussed. The collection procedure, the data analysis and the interpretation thereof, the limitations of the study, transferability and dependability, the demographics of the respondents and the ethical considerations, are also outlined.

Chapter 4 will present the research findings; Chapter 5 will be a discussion of those findings; and chapter 6 will provide a conclusion, which answers the research questions and makes some recommendations for possible future research.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter critically evaluates digital transformation in traditional retail banks, and how legacy systems inhibit the digital transformation strategy. This literature review provides a context to the subject by examining the previous research on digital transformation strategy and how legacy systems impact these strategies in South African banks. Subsequently, a critical analysis of the findings will be presented, followed by a conclusion.

2.2 Digital transformation

2.2.1 Defining of digital transformation

Digital transformation as a concept currently lacks a clear definition; as many definitions are associated with the term (Ismail et al., 2017; Osmundsen, Iden, & Bygstad, 2018). Digital business strategy is defined as an organisational strategy that is formulated and implemented by leveraging digital resources to create the differential advantage (Bharadwaj, El Sawy, Pavlou, & Venkatraman, 2013).

Digital transformation is also characterised as a major change in an organisation that is driven by digital technology, which modifies how business is conducted (Hess, Matt, Benlian, & Wiesböck, 2016; Osmundsen et al., 2018). Ismail et al. (2017) describe it as a company-wide strategy that is formulated to enable an organisation to tap into digital opportunities by leveraging its digital resources and capabilities. The transformation will span across multiple business dimensions, namely: operations, customer and business models.

The definitions align in terms of the intent of the transformation, which is fundamentally changing the way the business functions through leveraging digital capabilities. The transformation will ultimately shift customer orientation and the supporting operations that facilitate the servicing.

2.2.2 Theory on digital transformation

Digital transformation is concerned with the changes that digital technologies can bring about in a companies business model, which result in changed products, or organisational structures, or in the automation of processes (Ismail et al., 2017). The use of innovations, such as the social media, mobile devices, big data analytics and the cloud. These are transforming the way companies work (Westerman & Bonnet, 2015).

In the light of the digital transformation challenge, existing firms need to formulate and implement digital transformation strategies, in order to remain competitive (Hess et al., 2016).

According to Grant (2016, p. 12), companies need business strategies to give direction and purpose, to make effective use of the resources, and to co-ordinate the decisions made. Chantias (2017) corroborates this assertion; and this author states that companies are increasingly formulating and implementing digital transformation strategies, in order to address the multi-faceted parts of an organisation. It is also interesting to note that organisations that invest in digital technology and manage them well, are found to be more profitable than their industry peers (Fitzgerald, Kruschwitz, Bonnet, & Welch, 2013).

Reis et al. (2018) argue that companies need to develop a wide range of capabilities, in order to successfully transform the organisation. The business model needs to be reconsidered and changed, when undergoing transformation. It is not good enough to merely bring in new systems, without fundamentally changing the way the company operates. This assertion is reinforced by Chantias (2017), who argued that the digitisation of resources encompasses the transformation of crucial business operations, products and processes, which ultimately lead to transformed business models.

While all organisations acknowledge the need for digital transformation, getting definitive business benefits from digital technologies remains a challenge for many organisations (Fitzgerald et al., 2013; Reis et al., 2018). The complexity that arises from digital transformation is consequently multi-faceted since it

requires a complete overhaul in the way companies are structured. The way systems are used to gain a competitive advantage and, more importantly, implementation relies on management's ability to steer the organisation's digital transformation efforts (Ismail et al., 2017).

2.3 Digital transformation strategy

2.3.1 *Introduction*

Digital transformation relates to the business-model transformation that digital technologies can bring about in an organisation, resulting in product and service changes or organisational structures, or in the automation of processes (Hess et al., 2016). It is affecting all industries, and in order to understand the impact and plan for it, business leaders need to assess their operations and transform the organisation in its entirety. Furthermore, customer expectations have changed over time, with the increasing use of digital tools. This change is influenced by the convergence of technological and social forces, which have shifted how consumers interact with the banking industry in general (Ismail et al., 2017).

2.3.2 *Formulation and implementation of a digital transformation strategy*

Digital transformation is widely discussed in professional circles, yet empirical evidence of the concept is still somewhat limited (Reis et al., 2018). Strategy formulation and implementation concepts have been around for many years; however, digital transformation is still a relatively new concept.

Fitzgerald et al. (2013) conducted a survey that garnered responses from 1,559 executives and managers from various industries. The study was conducted to better understand how digital transformation aids organisations to achieve their strategic imperative of business improvement. Most of the respondents believed that digital transformation would be critical for their industry in the short term; although, they are concerned about the sluggish pace of change in their organisation. Digital strategy needs to be driven from the top down to be effective,

yet only 38% of the surveyed population had CEOs who shared their vision with the workforce.

Traditionally, IT strategy has been viewed as a functional-level strategy that supports the organisation's business strategy. This means that business strategies provide direction in the organisation, while technology has been viewed as an enabler (Bharadwaj et al., 2013). Bharadwaj et al. (2013) argued that this notion needs to be revisited. Organisations need to align the two strategies, and the fusion of the two is then referred to as a digital business strategy.

A similar study was conducted by Yeow et al. (2015), which examined the aligning process of digital strategy at the organisational level. Using a longitudinal study over five years, the study found that alignment is not a once-off process; it is continuous. Unlike other studies that provide a snapshot view, this study differed in that it tracked the actions of the organisation over time. The findings indicate that firms need to understand how the alignment process unfolds various cross-functional processes, and this can even differentiate the organisation from its rivals.

Furthermore, it is essential for companies to have a clear focus on integrating new and existing businesses. Leveraging existing business allows the organisation to build on the capability; however, it is advisable to have new resources to tie the new capabilities together.

In order to understand the challenges and the opportunities associated with digital transformation; Kane, Palmer, Phillips, Kiron, & Buckley (2015) surveyed 4800 professionals from organisations worldwide. Their study found that maturing businesses are focused on integrating digital technologies, in order to show their businesses work; whereas immature businesses are focused on solving bespoke business problems by using individual digital technologies. A key finding from the study is that digital transformation is primarily determined by a clear digital strategy supported by a leadership team that fosters a culture of change and define the new (Kane et al., 2015).

To aid in the formulation and the development of the digital transformation process, Ismail et al. (2016) conducted a review of the existing body of knowledge; and they presented novel insights on this practice. The study compares IT-enabled transformation with digital transformation, and it argues that the complexity of digital transformation supersedes that of the former. Digital transformation permeates every part of the business, and it challenges the existing silo approach.

The creation of cross-functional teams is encouraged to co-ordinate internal activities; since some roles often overlap. The study supports the findings of Horlacher & Hess (2016), regarding the role that ought to drive digital transformation. The new digital technologies necessitate distinctive competencies and mindsets, which is why CIOs are not best placed to drive digital transformation. Organisations' positions at top management are appointed to work alongside the CIO, to assist them in driving the digital agenda.

As an organisation develops digital strategies, the question about who drives this strategy frequently remains an issue. Typically, this role has been filled by CIOs; but this phenomenon is shifting in organisations. Horlacher & Hess (2016), using the case studies of companies undergoing digital transformation, explore the importance of digital transformation in the C-suite; and they present the role and responsibility of a Chief Digital Officer (CDO).

It should be noted that the emergence of this role is not new; rather academic literature on the phenomenon, which is still underdeveloped. The findings reflect that CDOs operate as change catalysts in their organisations. This new role is being used to drive cross-functional digital transformation in companies from a strategic perspective; whereas CIOs focus rather on the technical aspect of transformation. These two roles should be seen as symbiotic and complementary, but with a clear distinction between the two roles.

The study does not consider the strategic misalignment that might occur, as a result of two executives driving transformation. Without clear steering from the CEO and a structure to support the CDO, the role can become an internal consultancy function without any real control of the implementation thereof.

In another study, Chantias (2017) used an interpretive case-study approach to investigate digital transformation strategy development, from a process perspective. The findings showed that the digital strategy was predominantly shaped by emerging strategies through a bottom-up process; top management then formalised the emergent activities into a shared picture that comprised the digital transformation strategy. These findings align with those of a previous study that was formulated with different organisations in other industries.

The study also found that the creation of distinct governance fosters collaboration and transparency of on-going digital initiatives in the organisation. It must be noted that the study does not provide any in-depth analyses of the associated processes relating to strategy formulation. It is a high-level account of the key activities in the financial services sector. While the study acknowledges the emergence of bottom-up strategies, there are no clear guidelines on how that could be translated into a realised strategy. It is acknowledged that managements discretion remains pivotal in such circumstances, but the study leaves this area open to individual interpretation.

Osmunden et al. (2018) revealed insights as to why organisations transform digitally, how they transform; and how digital transformation affects these organisations. The findings are based on a systematic review of the existing literature, as well as empirical approaches. The study argues that digital transformation involves more than incremental business changes using digital technologies; it requires rethinking on how the entire business functions operate.

Moreover, it reiterates that digital is not just technical. The study highlights that the findings did not emphasise the importance of change management relative to digital transformation. Themes, such as power dynamics, conflicts, as well as uncertainty, were expected to arise in this context (Osmunden, 2018). The discussions of the empirical findings highlight the success factors and the inferences of digital transformation, which many organisations face today. The study also emphasises the importance of a supportive and agile company culture, an engaged workforce; and leveraged external and internal knowledge is emphasized in this review. For digital transformation to be prosperous, the entire

organisation has to assume a supportive culture in which both business and IT initiatives can thrive (Osmunden, 2018).

Organisational culture has attracted attention in the last few decades due to the unique function of leadership and the pivotal role they play in forming and embedding culture (Schein, 2010). Schein (2010) argues that when culture and leadership are examined closely, it is found that they are two sides of the same coin; they cannot be understood in isolation. Culture is seen as the result of a composite collective learning process that is partly influenced by the behaviours of leaders.

Reis et al. (2018) conducted a systematic literature review, using 206 peer-reviewed articles to provide insights, based on the literature of digital transformation. The findings were that digital transformation is a widely used term in professional settings; yet it tends to be neglected in the academic literature. The study presents two arguments: a cynical and an optimistic view. The cynical assertion made is that digital transformation could be regarded as a reincarnation of IT-enabled change initiatives. Organisations had been doing business optimisation previously; and this new buzzword might be an attempt to re-engage management and stakeholders.

Conversely, digital transformation includes novel elements that require managements' attention. However, the research suggests that management should align its business strategies to a digital reality. The findings are limited to the term; and they do not address the components of the definition, which in itself includes business process management (Reis, 2018).

Effective strategic development is only half the battle won. Organisations still need to implement the strategy, in order to gain the competitive advantage and to succeed. Loonam et al. (2018) reviewed 10 case studies on the approaches that the identified organisations had taken to implement successful digital technologies. The aim of the study is to provide practitioners with a benchmark to determine the key criterion for the successful implementation of digital transformation strategies.

The study found four key themes, which are critical when implementing digital transformation. Referred to as 'managerial actions', the themes are: customers, business-model innovation (strategy), technology and the organisation. These actions present traditional organisations with insights derived from digital native firms. To ensure the successful implementation of transformation initiatives, an organisation needs to understand customers' needs and to develop processes that support these needs.

These themes can be found to conflict in some instances. For example, management might be challenged to think differently about the relationship the organisation has with the customer; as the company transforms. To complement the actions of aligning business processes and the structure of the company, internal systems also need to be integrated, in order to get maximum results from the transformation.

When digitising entire business models, the associated business processes that drive the business strategy's implementation are becoming progressively dependent on IT (Bharadwaj et al., 2013). Coltman, Tallon, Sharma & Queiroz (2015) argue that the execution of the digital business strategy depends on the organisation's ability to leverage IT through business processes, thereby achieving two-way alignment. Moreover, it is noted that organisations are likely to perform well when critical IT resources, infrastructure, technical, and IT leadership skills are aligned with the business strategy.

The literature highlights the importance of effective strategic formulation; and it provides guidelines for practitioners on the digital transformation process. It is important to note that these studies were all conducted outside South Africa; and for the most part, they are not specific to the banking industry. The generic nature of these recommendations could make it difficult to implement them for practitioners in banking.

2.3.3 Digital transformation in the banking industry

Technology and socio-economic factors are changing the way bank customers interact with their institutions; and this requires banks to change the way they do

things, Gjino & Ilollari (2012) examined this phenomenon. To get to the findings, studies and research conducted by specialised companies were analysed to indicate the market situation. This approach was due to insufficient literature on the topic. The findings indicate that the rate of technological change in this field renders it challenging to find a winning model. However, the emphasis is placed on employing a blended approach and having both virtual and physical channels. This means that customers can use internet banking for basic services, and the branch network for more complex queries.

Virtual was identified to be a costly approach; and for social reasons, clientele was not ready to adopt a completely virtual banking experience. It must be noted that this study was conducted in 2012; and the penetration of the internet and technology has since advanced. As more customers adopt digital interactions in other areas of their lives, they expect the banking experience to change, and to be available on demand (Cuesta et al., 2015).

More recently, Cuesta et al. (2015) studied the concept of a changing competitive landscape and customer needs. The article identified three main phases in a banks digitisation process, namely: responding to new competition, the adaptation of technological infrastructure, and strategic positioning. Banks have been offering internet banking since the 90s; however, recently efforts are going in to transforming these offerings and opening up new channels on mobile devices. The study also found that banks are changing the technology platforms, in order to make them more flexible, thereby allowing for ease of integration with other tools.

The automation of processes is one of the ways that banks are improving the efficiency and the agility of their systems. The changes are already apparent in the industry: that is the way customers behave, and the amount of services available in the respective channels. The changes span across a number of operations, including the branch lay-out, employees' roles, operational formats and new metrics.

Similarly, Sia et al. (2016) analysed how the DBS bank in Singapore pursued its digital-business strategy in response to the threats of digital disruptions. The study found key capabilities and lessons for organisations seeking to pursue a digital-business strategy. For many organisations, it is now a business imperative due to threats of digital disruption; however, numerous organisations are finding it challenging to respond to these threats. This is caused by the compliance requirements of the sector and cumbersome legacy systems. This leaves the institutions with limited flexibility to experiment on innovation.

The study argues that it is not good enough to align IT strategy and business strategy; rather, the technology needs to be pervasively embedded into the operations of the bank. The key findings indicate that digital strategy requires strong leadership; and investment in agile core systems is imperative; organisations ought to exploit information abundance, in order to create new customer value and continuous navigation of the changing digital landscape. The study acknowledges that the answers to these questions are not always clear. However, initiating a process of seeking answers is a sensible first step in the pursuit of a digital business strategy.

Digital natives can co-create value on IT platforms; however, this phenomenon has not been examined academically for existing institutions. Noting this gap, Schreieck & Wiesche (2017) have studied how existing institutions can leverage IT platforms to co-create value. The study demonstrates that digital openness and collaboration allow for value creation; but they also create areas of conflict and potential benefits for established companies. The resulting areas of conflict could be internal resistance; since traditionally these companies have hierarchical structures. There are potential risks that can emanate, as a result of sharing access to critical parts of the company.

A potential benefit cited is internal transparency and standards that would need to be developed internally. The report asserts that platform governance is a useful instrument to facilitate value co-creation through digital platforms. Careful alignment is necessary, in order to avoid threats to the current business and potential loss of direct access to the customers.

In another study, Schmidt et al. (2017) looked at digitisation in the banking industry using a multi-stakeholder analysis. The results indicate that the internal processes are not yet ready to meet the demands of the strategic and customer perspective. The study revealed that the internal organisation and the IT are weakly aligned to the customers' expectations and the business strategy. The underlying processes within the bank need to be highly automated and standardised, in order to increase efficiency and customer satisfaction. The existing models aimed at aligning these activities have not yielded results. To shift this dynamic, special focus should be placed on the integration, optimisation and automation of business and IT processes.

When analysing the level of digital transformation in banking, Gigov et al. (2017) found that the analysed banks had primarily invested in the digitisation of basic banking functions; whereas the more complex functions remained unchanged. The amplification of online and mobile banking has transformed conventional banking universally. The growth of the mobile channel is indisputable; although the bank branches and the internet still represent the main channels. The findings demonstrate that banks invested largely in the basic bank functions; whereas the digitalisation of complex functions remains in the initial phase.

The conclusion reached by Cingillioglu (2017) is that, in order for banks to maximize technology investment, they need to find an optimal balance between managing risk and returns, by integrating risk assessments to the strategic plans. All technology projects undertaken need to be centred on those concrete benefits that are feasible and can easily be quantified. These benefits can include revenue growth, growth in customer numbers, cut reduction, reduced handling time and reduced error rate.

Performance evaluation is pivotal in this process, to ensure that key milestones are reached. The management of the transformation initiatives is of paramount importance to realise the investment. Moreover, this requires the support and the steering of key role-players in the organisation.

Digital transformation is impacting all industries; and the banking industry is no exception. The industry is constrained by heavy regulations, which limit the ability to innovate especially for legacy institutions (Sia et al., 2016). Digital natives have the autonomy to leverage IT platform value for the co-creation of initiatives; yet these are more complex for existing firms, of which many are banks (Schreieck & Wiesche, 2017).

2.3.4 Proposition 1

Digital transformation involves more than the mere technological enablement of a traditional business by using digital technologies; it requires rethinking of the entire business model; and how the organisation is to function operationally.

While digital transformation emphasises the change due to the proliferation of digital technologies, history has shown that some organisations' technological advances have been hounded by failed strategy attempts; as they focused solely on technology, without considering the broader strategic decision (Ismail, Khater, & Zaki, 2017). Consequently, organisations need to focus on broader digital transformation, which incorporates both the business model and the operational changes.

2.4 Legacy systems

2.4.1 Definition of legacy systems

A legacy system is a system that was built in the past using technology of the time which has since been replaced by newer technology (Gangadharan, Kuiper, Janssen, & Luttighuis, 2013). Similarly, Hussain, Bhatti & Rasool (2017) describes legacy systems are systems that were developed approximately 2-3 decades ago and were fulfilling their intended functionality. However, the emergence of new technology resulted in changed requirements which the system cannot respond to timeously. Legacy systems also known as old information systems that remain operational in an organisation (Crotty & Horrocks, 2016).

2.4.2 *Theory on legacy systems*

Legacy IT systems are often the biggest stumbling block for established companies seeking to compete successfully against digital veterans (Avedillo, Begonha, & Peyracchia, 2015). It is projected that organisations that struggle to adapt to digital transformation will fall victim to “digital darwinism”, where only the organisations that are responsive to technological trends will survive (Ismail et al., 2017). While academics and professionals acknowledge the business value of digital business transformation, existing organisations are still constrained by legacy infrastructure which is often core to their operations. Companies need to work within these limitations as they attempt to innovate (Haffke et al., 2017).

Established organisations face a time-to-market dilemma as they need to get products and services and optimise processes without compromising on the existing operating processes (Bossert, Laartz, & Ramsøy, 2014). Avedillo et al. (2015) proposes two paths to transforming traditional organisations, two speed IT and greenfield IT. Two-speed IT means that the organisation is running both legacy systems and new systems. The new system allows for quicker iterations while the backend runs the core systems usually to maintain stability. In contrast, greenfield IT means organisations replace legacy systems. Organisations are trying to maximise their return on investment on legacy systems and this often comes at the expense of digital transformation and increased operating costs in the long run (Avedillo et al., 2015).

2.4.3 *The legacy system challenge*

As industries transform, traditional organisations are required to change their operating models to align to changing customer needs. While firms can formulate digital strategies to compete in the changing environment, the integration of new technology to the existing infrastructure and exploiting the benefits of the new digital technologies remains one of the biggest challenges (Hess et al., 2016).

As a result, some organisations are running both legacy and digital systems. The coexistence of digital and legacy systems has been termed bimodal IT or two speed IT (Horlach, Drews, & Schirmer, 2016). The financial services industry

invests heavily on IT systems but most of this spend is on maintenance necessary to keep legacy systems operational. (Crotty & Horrocks, 2016). This indicates the need for this industry to find a balance between these two IT speeds considering the changing competitive landscape. Should they respond slower than their competitors, their competitive advantage will be at risk.

Gangadharan et al. (2013) formulates seven propositions suggesting that can be used by organisations to continue with legacy systems or decommission. In summary, organisations should consider 1) software characteristics, 2) system development methods, 3) dependency on other systems, 4) vendor lock-in, 5) system complexity, 6) emergence of new technologies and 7) system ownership influence the decision whether to decommission or to maintain a system.

The balance between existing and new IT in an organisation can be improved by making use of the seven propositions to determine the influences and then select the most effective measures. The article proposes a methodology to determine a healthy balance between legacy and new systems. An innovation indicator can be used which is the ratio of budget percentage for legacy systems and new systems. The ratio can be used to determine the balance between the two systems. The paper proposes improvements for the identified propositions in order to maintain the balance. Ultimately, there is no empirical evidence that denotes what a healthy balance is. Organisations need to determine this based on state of development, the type of organisation and other factors. The paper further suggests that the CFO and CIO should agree on a healthy balance for the organisation using the innovation indicator as a guide.

In another study, Crotty & Horrocks (2016) identifies the features of legacy systems and investigates the underlying reason for the high maintenance and support costs of such systems. The study defines a legacy system as a system that is critical for business continuity and demonstrates one or more of the following additional features: old age, obsolete languages, poor or no documentation, deficient data management, a degraded structure, limited support capability and capacity, altered to meet business requirements, mounting maintenance costs, and lacking the necessary architecture to transform. The paper cites numerous legacy cost management solutions, such as restructuring,

reverse engineering, system migration and system freeze. The paper presents a legacy system assessment meta-model with various attributes.

Horlach et al. (2016) found that while most of the sources found value in the concept of bimodal IT for addressing digitalisation, some found it to be detrimental to the organisation. The approach has been criticized for maintaining organisational silos and creating new ones. To overcome the tension, a multi-faceted IT operating model with multi-speed governance supporting it should be employed.

Additionally, bimodal IT has been criticized as temporary and transitional state for pursuing digital transformation. While pursuing innovation, the impact on the legacy core systems is not addressed in the long term. To maintain the competitive advantage, it is recommended that companies employ trimodal or other multi-speed IT methods, in order to bridge the gap between business and technology.

Sebastian et al. (2017) examined empirically how traditional companies can navigate digital transformation, in order to succeed. The analysis revealed that existing organisations still rely on traditional revenue streams. It was further established that companies who recognised the opportunities presented by digital technology used one of two strategies, namely: customer engagement or digitised solution. Interestingly, the results indicate that traditional organisations found it easier to articulate the digital strategy than to implement it. To succeed in digital transformation, large traditional organisations need to embrace new structures and processes that encourage collaboration and co-creation.

In a similar study by Hussain et al. (2017), a concession is made that preserving legacy systems is no easy feat, every maintenance intervention contributes to its complexity and also the expertise needed may not be available due to the system age. Besides decommissioning the system completely, the research article indicates that legacy systems may be rewritten in some parts and replaced with a new one. This is known as software reengineering.

In a paper that explores the bimodal approach that effectively supports and drives the organisations digital agenda, Haffke et al. (2017) introduces the idea of

bimodal IT to the scholarly discourse as the division of the IT function into two modes or speeds. Mode 1 is focused on stability of the existing IT function and Mode 2 is focused on assisting the organisation to respond to the digital transformation agenda.

Contrary to Horlach et al. (2016) findings, this study argues that for numerous companies, a bimodal IT design operates as a transitional phase in the pursuit of embedding enhanced agility and a stronger IT exploration function, ultimately the function operates as unimodal. Organisations using bimodal IT can use it as a gateway to enable IT transformation. Consequently, the division of the function into two can impact culture, be costly to implement and result in negative team dynamics. The study suggests that these modes should be merged in the long term.

2.4.4 *Proposition 2*

Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.

Companies that are plagued by traditional core systems are often unable to replace them all at once. To mitigate this challenge, organisations operate both digital and legacy system with a strategy to decommission the legacy in the future. The management of the spend between investing in new systems and maintaining legacy systems is a decision that needs to be made by the organisation CFO and CIO.

2.5 Conclusion of the Literature Review

The literature reveals that strategy formulation is only half the battle won, organisations need to have the capabilities and supporting structure to implement these strategies to gain competitive advantage. The research reveals that implementing is a challenge for a number of organisations due to internal complexities, be it structural, cultural or technological.

Existing companies are faced with the challenge of navigating archaic systems and ensuring business continuity while attempting to remain competitive through innovation initiatives. The pace of change in the market together with customer demands puts companies under pressure to transform.

The findings reveal that the new digital transformation landscape differs from previous IT-enabled changes due to complexity. The transformation does not merely focus on automating basic processes but transcends to reformulating business strategies, driving efficiency, scalability, reliability and predictability of the core business operations. Digital transformation simultaneously facilitates agile methodology in response to customer needs.

This phenomenon has led to organisations reviewing their management structure and introducing a new role, CDO, that will drive transformation. The CIO continues to drive the technological enablement for the company working alongside the CDO. Though this makes sense conceptually, organisations still face challenges with the operationalisation of this new structure as they struggle to differentiate between the two roles and manage the politics that arise as a result. It has also been found that organisations that are not mature in digital transformation use technology to solve bespoke business problems instead of holistic business challenges.

2.5.1 *Proposition 1*

Digital transformation involves more than technological enablement of a traditional business using digital technologies; it requires rethinking of the entire business model and how the organisation functions operationally.

2.5.2 *Proposition 2*

Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.

CHAPTER 3. RESEARCH METHODOLOGY

This chapter outlines those aspects of the research process used to conduct this study. It provides information about the research approach, the research design and sampling method of the study. The data collection method and procedure are also explained, including the population and sampling methods. The chapter also includes the research instrument, ethical considerations, study limitations, reliability and validity and the techniques used to analyse data are also discussed.

This chapter also focuses on the methodologies used to examine the process in place to navigate digital transformation and legacy systems in retail banks. It also highlights the rationale for the selected empirical methods and the approach used to address the research objective.

3.1 Research approach

The study uses a qualitative research approach consisting of semi-structured interviews for data collection. This approach was selected as the study investigates the phenomenon of digital transformation, as it is understood by leadership within the bank. The premise of a qualitative approach is to allow for insights to be gained into the experiences of individuals (Leech & Onwuegbuzie, 2007). Moreover, qualitative data often contain fundamental depth with a strong potential for revealing complexity (Leech & Onwuegbuzie, 2007). In this study, the questions were chosen based on the derived research propositions, as outlined in Section 2.5 of the literature review.

Qualitative data, according to Leech & Onwuegbuzie (2007), have the following advantages:

1. They provide information that aids research projects in increasing their understanding of phenomena.
2. They are often collected in close proximity to the specific subject that is being researched through direct observation or in a face-to-face interview. This allows researchers to consider and maintain the context from which the insights were derived.

3. They can often contain depth and richness of information, thereby revealing complexity.

3.2 Research design

The typology of the research design is empirical in nature. Empirical studies enable the development of new knowledge from the collected data: whereas non-empirical studies make use of the existing literature, modelling and the philosophical and conceptual analysis, in order to develop new knowledge (Saunders, Thornhill, & Lewis, 2009).

In researching digital transformation in a traditional bank, a case study method is advantageous for gaining a deeper understanding of a phenomenon (Ritchie, Lewis, Nicholls, & Ormston, 2013). This method affords the researcher the ability to generate insights from a real-life setting, leading to the development of deep empirical theory (Saunders, Thornhill, & Lewis, 2009)

The study follows an inductive approach to theory development, in that data were used to investigate the phenomenon of digital transformation. Using this approach, a review of the existing theory was done before drafting the research questions.

3.3 Data collection methods

The primary data was collected by using a semi-structured interview targeted at business heads within the retail business. The interview guide was created, based on the literature reviewed. Some of the questions were adapted from previous literature; while others were self-formulated questions. To test the validity of the questions, counsel was sought from the academic supervisor where the questions had been reviewed, to ensure alignment with the research questions.

Although an interview guide was used, the questions were slightly adapted in cases where the participants had covered more than one question in one response. There were also instances where different wording was used to explain

the question in a language that was understandable to the participants. The face-to-face nature of the interviews allowed for clarification questions and further probing when additional information was required.

The participants were requested for their consent to participate in the survey and for the interview to be recorded. For the duration of the interview, the responses were recorded by using an audio recording mobile application for later transcription. Only one of the participants requested to see the questions beforehand; while the rest were exposed to the questions in the interview.

A case could be made for the advantage of using semi-structured interviews when undertaking an exploratory study, thereby allowing for inferences to be made between the variables (Saunders et al., 2009). Secondly, this instrument allows for probing where the participants are not clear, or where an explanation of a subject is required (Saunders et al., 2009). Thirdly, they can lead to the exploration of other areas of a phenomenon, which had not previously been considered; and this is notable for the study (Saunders et al., 2009). Fourthly, this allows for assurance to be given to the participants on the manner in which the information will be utilised and the confidentiality thereof (Saunders et al., 2009).

Instances arose where the participants needed validation on the confidentiality clause of the research, before giving their honest opinions about such matters. Lastly, due to the complexity of the subject and the time investment required, interviews were scheduled at convenient times for the participants, thereby reducing their possible anxiety, due to the conflicting demands.

3.4 Population and sample

3.4.1 *Population*

The population of the study comprises all employees of the Retail division of Bank X, South Africa. The bank is one of the top 4 in the country; and it has been in existence for many years, thereby fitting the profile of a traditional retail bank. Moreover, the bank, much like other traditional banks in the country, is

undergoing digital transformation; and it is currently navigating the legacy-system challenge, as it transforms its business.

3.4.2 *Sample and sampling method*

The method used for this study is a non-probability sampling method, specifically purposive sampling. To a certain degree, the sampling method used is also convenient; as the researcher is employed by the bank, thereby making it easier to access the participants for this study. Moreover, the time constraints to complete the study was a key consideration. The participants were selected on the basis of seniority, as well as their experience in strategy formulation and implementation within the retail bank.

The sample size of the study comprises 15 Business Heads, representing various departments within Retail, namely Everyday Banking, Physical Channels, Virtual Channels, Home Loans, Finance, Customer Value Management, IT and Business Transformation. The departments were chosen to obtain diverse views from the product owners, IT support, Channel, as well as support functions. It is believed that these insights will provide diverse views and opinions on digital transformation.

Table 3 reflects the profile of the sample based on the division in the bank.

Table 3: Profile of proposed respondents according to their division

Division	Number of interviewees
Everyday Banking (Card Issuing, Transactional, Personal Loans and Savings & Deposits)	6
Finance	1
Virtual Channels	1
Home Loans	1
Physical Channels	1
Customer Value Management	1
Transformation & Change	2
Business IT	2
Total	15

3.5 Research instrument

The research instrument used for this study is a semi-structured face-to-face interview, administered by using an interview questionnaire in Annexure A. The interviews were semi-structured in that a list of questions was prepared that allowed for additional information to be provided, or for further clarity on the answers provided. In order to manage the expectations of the participants, the structure of the questions was explained to them before the interview. This also aided in guiding the responses from the participants; as they could contextualise their response, based on the section of the question.

3.6 Procedure for data collection

For the purpose of this study, all the participants were interviewed using face-to-face interviews. These interviews were held in Johannesburg offices; as all the participants are based in Johannesburg. At the start of each interview, the context of the study was provided to the participants on the basis of the selection, that being their experience and involvement in the digital strategy process. The respondents were given an opportunity to ask questions or to seek clarity before the commencement of the interview.

Furthermore, the participants were requested to sign consent forms (see Appendix A) agreeing to participate in the study, and their willingness to be recorded.

The following steps were used to collect the data:

1. The sample was identified, based on job function, tenure and seniority in the organisation.
2. Identified individuals were approached after meetings, or in common areas at the Johannesburg offices, in order to explain the intent, and to request their participation in the study.
 - a. In some instances, the participants were contacted via email and requested to participate. The participant-information sheet was included in the emails (see Appendix C).
3. Where participation consent was obtained, a follow-up with an email was sent to the participant, and in some cases their assistant to ask for time in their schedules.
 - a. Interviews were scheduled for 60 minutes; and they were held in the Johannesburg offices.
4. At the beginning of each interview, the context of the research was provided, outlining why the research was being done; and the participants were thereby given an opportunity to ask questions before the start of the interview. The participants were also requested to consent and give their permission for the interview to be recorded.

5. All the interviews were conducted in a boardroom, to allow for recording without any noise. The recordings were done by using a mobile phone-on-airplane mode, in order to avoid any distractions.
6. The data were transcribed after all the interviews had been conducted.

Conducting face-to-face interviews allowed for the adaptation of the questions and probing when additional information is required. Only one participant requested that the survey questions be sent beforehand. The questions were open-ended in nature, to allow for the participants to express their opinions without restriction. Where necessary, probing was done to get deeper insights, or clarity on the responses. In some instances, the order of the questions was adapted based on the conversation flow, or the respondent having covered a question in an earlier answer.

3.7 Data analysis and interpretation

For this study, the data analysis procedure followed a thematic-analysis process, as prescribed by Braun & Clarke (2006). The aim of a thematic process is to identify patterns or themes within the qualitative data (Braun & Clarke, 2006).

The thematic analysis process (Braun & Clarke, 2006):



Figure 1: Thematic analysis process

1. Familiarity with data

The interview recordings were transcribed into an orthographic transcript (Braun & Clarke, 2006). The interviews were transcribed using Otter.ai, a software tool that auto transcribes voice recordings to text. Punctuation and annotations were added for easier analysis; for instance, where participants repeated words or made errors in speech, these were depicted within square brackets to facilitate simpler interpretation during the analysis stage. All

sensitive participant information from the transcripts was removed in line with the anonymity agreement. Following the transcribing, the impressions on the qualitative data were captured based on research questions.

2. Generation of initial codes

NVivo software was used to formulate the initial codes for the qualitative data. An inductive approach was used to analyse the data, thereby allowing for themes or codes to emerge from the data collected (Saunders et al., 2009). Where duplications in codes occurred, these were later grouped, in order to create alignment. Notes were taken on potential themes and the patterns, which had been observed.

3. Identification of themes

The identified codes were grouped into themes. Initially, the grouping was based on the research question; but sorting of the codes occurred where themes and patterns were observed.

4. Reviewing of themes

The themes were refined; and, in some instances, they were renamed, in order to ensure that they adequately reflected the coded data. The software had visualisation functionality; and these mind maps aided the creation of connections between the themes. Manual (pen and paper) mind-maps were used to create relationships between the main and the sub-themes.

5. Definition and naming of identified themes

An analysis of the data sitting within each theme was conducted. The emerging themes were reviewed, including the validity thereof, to ensure that they had been adequately refined, and that a storyline could be built.

6. Writing of report

A write-up of the emerging information was done, with the intention to narrate the observations and the researchers' interpretations.

3.8 Limitations of the study

- The study is limited to the qualitative method, due to the time constraints.
- The study lacks external validity; as it is based on one traditional bank; and it does not represent any other traditional banks in the industry.
- The context of the organisation might not be replicable with other organisations and industries.
- The sample included only senior leaders; and it does not consider the perspectives of lower-level staff in the organisation.

3.9 Transferability and dependability

3.9.1 *Transferability*

The validity of a qualitative study assesses the external validity of the study, and whether or not the information necessary for answering the research questions has been obtained (Denzin & Lincoln, 2011). The process of data collection was homogeneous to a large extent, whereby an interview guide was used to create consistency in the data collection method. It is noted that no single interpretation method exists for qualitative data; however, the data analysis process will aid in the transferability of this study.

3.9.2 *Credibility*

The credibility of qualitative research looks at the internal validity of the study (Denzin & Lincoln, 2011). To ensure the credibility of the interview questions, some of the questions were extracted from published studies; while the rest were tested with the academic supervisor for their validity.

3.9.3 *Dependability*

The reliability of the findings is dependent on the consistency of the results (Denzin & Lincoln, 2011). Similarly, as with the validity of the results, the reliability would be ensured by following a rigorous thematic analysis; and the steps thereof

are outlined in section 3.7 of this document. These steps could be applied by subsequent researchers in their attempt to recreate this study. It must be noted, however, that the prevailing circumstances and the context of this subject are subject to change and that might influence the replication of this study.

3.10 Demographic profile of respondents

The sample population comprised 14 males and 1 female. The positions targeted for this study were predominantly occupied by male incumbents. It is believed that the gender of the population has no bearing on the results of this survey, as it relates to strategy formulation and implementation in a traditional institution.

3.11 Ethical considerations

- The purpose of the study was explained to all the participants; and they were requested to sign the consent form.
- The anonymity of the participants has been upheld. In other words, the respondents have been referred to as participant P1, P2, P3, etc.
- Research permission letters were completed and signed by the organisation, in line with the requirements of the university.
- The name of the organisation will not be included in the final report; and the final report will refer to a traditional bank or a bank.
- Upon finalisation of the report, a plagiarism declaration form will be signed, and a Turnitin report will be provided, to show that no plagiarism has taken place.

CHAPTER 4. PRESENTATION OF FINDINGS

4.1 Introduction

In this chapter, the findings from the qualitative research conducted are analysed. This chapter begins with a presentation of the background on the participants and the case bank, hereon referred to as Bank X. The findings presented in this section reflect the emerging themes from the insights shared by the participants. The analysis was conducted using the thematic qualitative approach discussed in section 3.7 of this report. The findings are outlined using this analysis method relative to the propositions presented in Chapter 2.

4.2 Background information

4.2.1 *Background on Bank X*

The case company is one of the four major banks in South Africa. Bank X is a traditional bank institution that is undergoing digital transformation. The institution is listed on the Johannesburg Stock Exchange, and the head office is situated in Johannesburg, South Africa. Bank X is a full-service bank, but for the purpose of this study, the focus will be on the Retail division of the bank. This division has been chosen as it services the mass market, and customers are often likely to interact with the products and services. As such, customer experience is a crucial determinant for the innovation and transformation of this unit.

A high-level depiction of the RBB business structure is presented below with a brief description of each business unit's function.

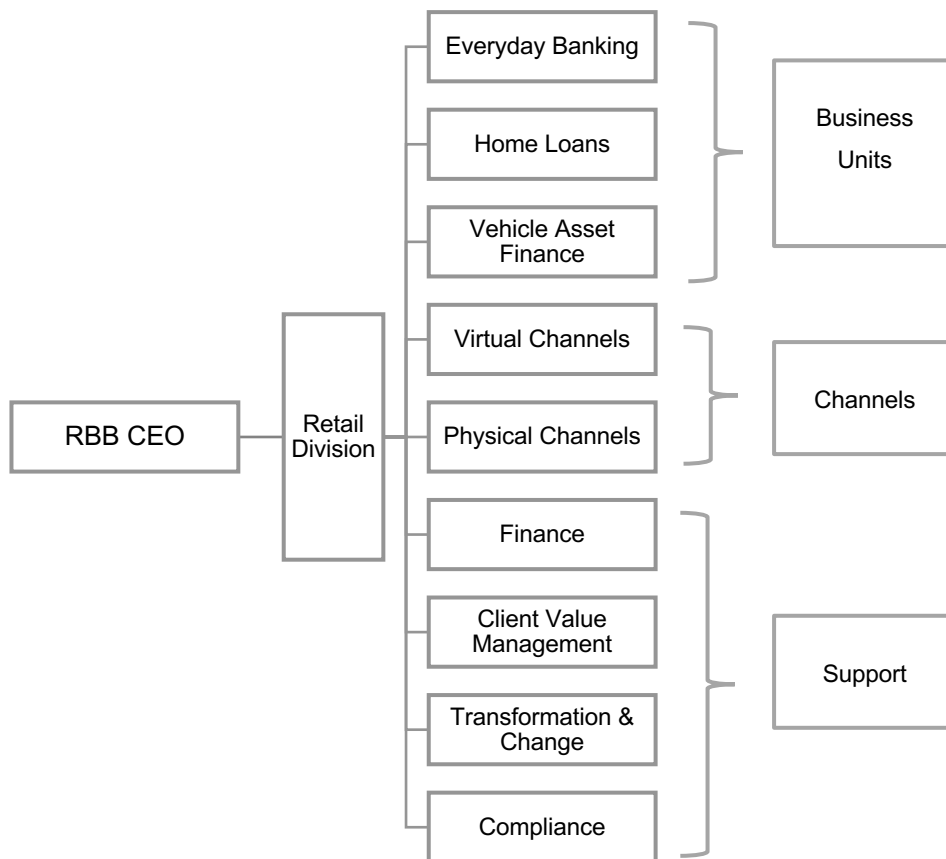


Figure 2: Bank X Retail bank organisational structure

1. Everyday Banking: Day to day banking service. This business unit is a combination of Credit Card, Personal Loans, Savings & Investments and Transactional Accounts
2. Finance: Management of funds in the business
3. Vehicle Asset Finance: Motor vehicle finance to individuals, approved dealerships and suppliers.
4. Home Loans: Residential property finance solutions
5. Physical Channels: Branches, regional offices and self-service terminal networks
6. Virtual Channels: Voice and digital strategy enablement (including digital self-service channels)
7. Customer Value Management: Development of customer value propositions for all retail customers
8. Transformation and Change: Coordination of strategic change programmes
9. Compliance: Management of control environment

Each business unit has their own CIO, Risk Management, Analytics, Change Management and Operations teams. This is part of the strategic objective to give business unit heads end to end accountability on their entire value chain. This is with the exception of Compliance.

4.2.2 *Background on the participants*

This section presents background information on the participants and the case company. All the interviews were conducted at Bank X head offices. Due to the agreed confidentiality about the participants and the case organisation, the identities of the participants are referred to as P1, P2, P3, etc.

Table 2 below reflects information on the participants of the survey. It can be observed that all the participants are of executive and managing executive level and have been exposed to strategy formulation and implementation in the organisation. It can also be noted that male incumbents dominate the representation, but this does not impact the results of the study. From a race perspective, the participants are predominantly spread between African and white people. The respondents' average tenure is 12 years, which is an indication of strong institutional knowledge and experience. The participants are spread across different business units and the support areas within the Retail division to represent broad views.

Table 2: Participant information

Code	Gender	Race	Tenure	Department	Job Level
P1	Male	African	4.5	Transformation & Change	Executive
P2	Male	African	4	Client Value Management	Executive
P3	Male	African	6	Everyday Banking – Savings and Deposits	Executive
P4	Male	White	20 with service breaks	Virtual Channels (IT)	Executive
P5	Male	African	2.5	Everyday Banking – Consumer Issuing	Executive
P6	Male	African	12	Transformation & Change	Managing Principal
P7	Male	White	4.5	Everyday Banking (IT)	Executive
P8	Male	White	15	Everyday Banking	Managing Executive

P9	Male	White	20	Business Change	Executive
P10	Male	African	2	Virtual Channels	Executive
P11	Female	White	30	Everyday Banking – Strategy & Analytics	Executive
P12	Male	White	35	Everyday Banking - Payments	Executive
P13	Male	Coloured	8.5	Physical Channels (IT)	Executive
P14	Male	African	6 with service breaks	Business Finance	Principal
P15	Male	White	12	Home Loans	Managing Principal

4.3 Research questions

The research questions sought to establish how traditional banks formulate and implement digital transformation strategies. Furthermore, the intention was to investigate how the inhibitions caused by legacy systems are managed as the bank attempts to transform digitally.

1. How do traditional banks formulate digital transformation strategies?
2. How do traditional banks implement digital transformation strategies?
3. How do the traditional banks manage the inhibitions caused by legacy systems on their digital transformation strategies?

4.4 Analysis using thematic analysis process

The analysis was conducted using the thematic analysis process depicted in Figure 3 below.



Figure 3: Thematic analysis steps

4.4.1 *Familiarity with data*

Data was prepared into text format to allow for the analysis to be conducted. Thereafter initial impressions on the data were captured based on the research questions and have been summarised below.

1. **Initial Impressions:** How do traditional banking institutions formulate digital transformation strategies?

The bank strategy is centred around the ambition to compete digitally. The driver of the digitisation agenda is multifold; however, the critical consideration is that the banks' customers expect it. Thus, it has become a threshold capability to compete in the banking industry rather than a key differentiator to gain a

competitive advantage. The understanding of digital lacks homogeneity in the bank, whereby some business heads consider the digitisation of the whole value chain, and others refer to customer self-service enablement using mobile and web. The strategy formulation process appears to be well-coordinated, albeit that disparate understanding seems to exist concerning the new structure and the roles of certain functions.

2. Initial Impressions: How do traditional banking institutions implement digital transformation strategies?

The senior leadership that was interviewed rally behind the banks' intent to digitise. Due to the traditional nature of the organisation, there is a high demand for digital transformation, and the ability to execute in an agile manner is not where it should be. While the digital strategy's implementation lies in the individual business units, custodianship of the strategy does not appear to be known by all stakeholders. In fact, the apparent confusion on the custodianship could indicate a lack of maturity of the digital strategy in the bank as custody should be clear and understood by all. Despite the digital transformation efforts, the legacy infrastructure is seen as an inhibitor to the effective implementation of the banks' digital transformation strategy. Additionally, the legacy has a direct impact on the customer experience and the organisation's growth ambitions. This is explored in detail in research question three.

3. Initial Impressions: How do the banks manage the inhibitions caused by legacy systems on their digital transformation strategies?

The organisation resulted from a merger of traditional banks whereby a new bank was formed. This merger has created a complex architectural landscape for the organisation. To further exacerbate the complexity, the mainframe systems were coded using old programming languages, which are no longer used mainstream, resulting in skills shortages. The pace of getting things to market is perceived to be slow due to the challenges presented by the infrastructure and the waterfall delivery methods of releasing changes to the market. The bank has several initiatives in progress that are aimed at mitigating the challenges presented by

the systems. Critical decisions need to be made on architecture, which will inform the long terms strategy of the systems.

4.4.1 Generation of initial codes

The initial codes were generated using the research questions as a guideline. The process of open coding was applied, meaning that there were no pre-identified codes. The codes were formed by going through the transcripts to determine the emerging themes. This process was done with the research questions in mind; therefore, the approach followed is a theoretical approach.

All codes pertaining to proposition one have been grouped into one table for ease of analysis. Figure 4 reflects the initial codes that were generated. These were initially grouped by research questions to identify key insights before deriving themes.

Bedrock program	Cascading strategy	Strategy approach	Interventions
Creating alignment between execution and strategy	Alignment	Benchmarking	Abstraction layer
Governance on Change	Communicate the plan	Bottom up strategy	Build, Test, Replace
Infrastructure roadmap	Easily understandable	Business roleplayers in formulation	Detangling the legacy
Speed up execution	Misalignment	Compete in market	Key decisions on infrastructure
Challenges	Culture	Decentralised strategy (BU)	Leverage the opportunities
Building digital on top of legacy	Determines success of strategy	Top down strategy	MVP
Change Management capabilities	Fail forward	Use of data	Partnerships
Commercialisation	It is transforming	Role of leadership	Remove customization
Cost of replacing	Needs to be influenced by leadership	Communicate plan	Sweat existing assets
Culture	New ways of work	Enablement	Bimodal
Customer experience	Non digital hinders competitiveness	Executive sponsorship	Agile and Waterfall squads
Delivery speed	Not making tough decisions	Guide the implementation of strategy	APIs and middleware
Duplicate initiatives	Old mindset inhibiting new thinking	Remove blockages	Common rails and platforms
Execution model	Ownership - being invested	Reset culture	Concurrent systems
Inefficiencies	Quick decision making - flattened structure	Speed of decision making	Creates complex architecture
Legacy systems	Reset of policies required	Operating model	Different programming languages
Limited funding	Speed of execution	Changing operating model of banking	Drive digital whilst running legacy
Operating model	Custodian of the plan	Delayed levels quicker decision making	Slow mode for mainframe
Prioritization	All business heads	Digitally transformed organisations have single digital strategy	Core legacy systems
Process	Central forum to guide	Disconnect - Digital vs Business CIOs	Modernising architecture for easy integration
Skills shortages	Customer value management	Disparate customer experiences	No perceived strength with legacy
Speed of decision making	Digital enablement function (VC)	Drives ownership	System architecture
Understanding of digital	Everyone	Drives short termism culture	Challenges
Digital vs IT strategy	No clear custodian	Evolving	Architectural strategy
Central function supporting digital	Who should drive digital agenda	New ways of work	Architecture not future proof
Different	Customer experience	Operating model	Building digital on top of legacy
IT providing thought leadership	Customer enablement	Perpetuates silos	Change Management capabilities
Operating model (no CDO)	Omni channel servicing	Reliance on physical branches	Cost of replacing
Previously centralised digital strategy	Focus areas	Roles and Responsibilities	Delivery speed
They should work in harmony	Automating backend processes	Aligned to performance measures (PDs)	Digitise both back and frontend
Digitally led	Framework of strategic intent	Clarity of roles	Execution model
Catch up to market	Define strategic intention	Connecting the ecosystem	Inability to build rails
Compete digitally	Leadership of digital	Evolving	Inefficiencies
Digital enablement	Business owned digital agenda	Gaps exist on lower staff levels	Integration
What does digital mean	Monitoring & Evaluating	Not clear	Legacy operating model
Operationalise strategy	Alignment to the strategy	Reset ways of work - deliverables based	Legacy systems
Book of work	Business reviews with Exco	Skills	Legacy ways of work
Business driven digital strategy	Customer sentiment insights	Capacity constraints	Limited funding
Fixing the business	Key value drivers	Digital & Change skills	Maintenance cost
Funding of digital	Opportunities	External resources	No documentation
Implementation plan at BU level	Data competitiveness	Insourcing skills for transforming business	Operating model
Period of strategy	Slow speed to deliver	Key man risk	Prioritization
Working towards agility	Governance stifles agility	Mechanisms to educate employees	Process
	Inability to scale due to silo dev	Problem solving skills	Slow
Structure of IT teams	Technical landscape		Tech skills
Alignment of delivery teams	outsourced tech		Competitors have similar challenges
Composition of squads not optimal	Tracking of strategy		Not seeing tech as constraint
Multi squads grouping	Use of data (KVDs) to monitor and evaluate		
Sequential dev timelines			
Research question one	Research question two	Research question three	

Figure 4: Initial codes

From the coding process conducted, there were 164 open codes derived which included several repetitions and similarities. It can be observed that several initial codes were generated, and many duplications existed. Consequently, the codes were classified into main codes and sub-codes. The identified codes were organised into 28 categories namely (1) Bedrock programme, (2) Strategy Challenges, (3) Digital vs IT strategy, (4) Digitally led, (5) Operationalise strategy, (6) Structure of IT teams, (7) Cascading strategy, (8) Culture, (9) Custodian of the plan, (10) Customer experience, (11) Focus areas, (12) Framework of strategic intent, (13) Leadership, (14) Monitoring & Evaluation, (15) Opportunities, (16) Slow speed to deliver, (17) Technical landscape, (18) Tracking, (19) Strategy approach, (20) Role of leadership, (21) Operating model, (22) Roles and responsibilities, (23) Skills, (24) Interventions, (25) Bimodal, (26) Core legacy systems, (27) Legacy Challenges (28) Competitors. These categories are depicted in Figure 5 below.

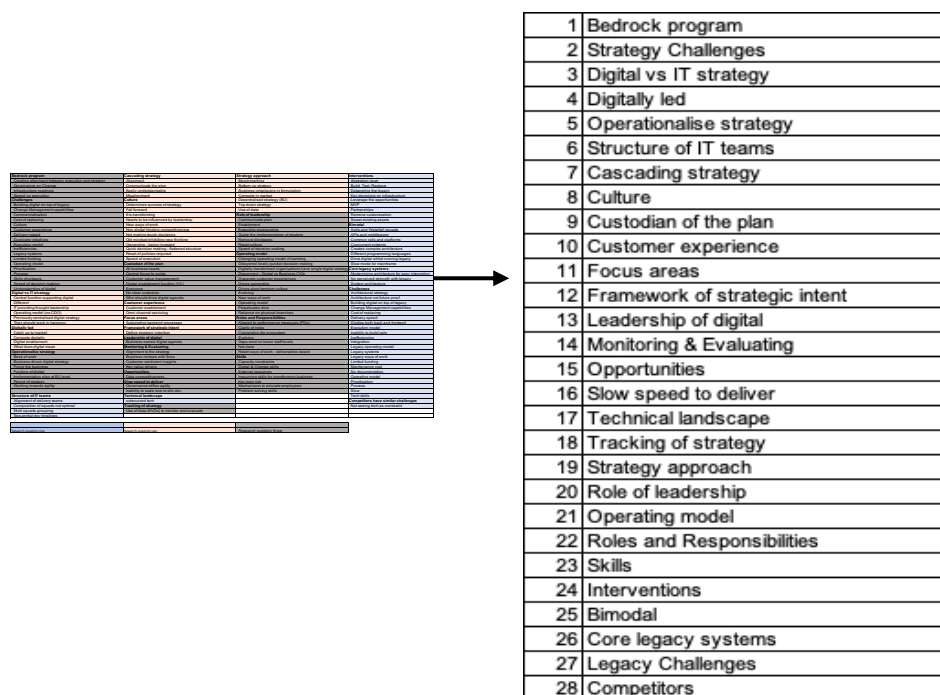


Figure 5: Initial codes to categories

4.4.2 Identification of themes

Succeeding the identification and generation of the initial codes, similar codes were grouped together into categories and in some instances, sub-categories based on patterns emerging. The identified themes were linked back to the three main research questions of the study. For visualisation purposes, colours have been used to highlight the new themes that have emerged from the codes identified, these are reflected in Figure 6 and 7. It can be noted that some of the codes were reclassified into existing categories as they were duplications in some respects.

Bedrock program	Operating Model	Roles and Responsibilities	Operating Model
Creating alignment between execution		Aligned to performance measures (PDs)	
Governance on Change		Clarity of roles	
Infrastructure roadmap		Connecting the ecosystem	
Speed up execution	Operating Model	Evolving	Digital Strategy
Operationalise strategy		Gaps exist on lower staff levels	
Book of work		Not clear	
Business driven digital strategy		Reset ways of work - deliverables based	
Fixing the business		Digital vs IT strategy	
Funding of digital		Central function supporting digital	
Implementation plan at BU level		Different	
Period of strategy		IT providing thought leadership	
Working towards agility	Operating Model	Operating model (no CDO)	Digital Strategy
Custodian of digital		Previously centralised digital strategy	
All business heads		They should work in harmony	
Central forum to guide		Digital	
Customer value management		Catch up to market	
Digital enablement function (VC)		Compete digitally	
Everyone		Digital enablement	
No clear custodian		What does digital mean	
Who should drive digital agenda	Operating Model	Focus areas	Digital Strategy
Leadership of digital		Automating backend processes	
Business owned digital agenda		Framework of strategic intent	
Monitoring & Evaluating		Define strategic intention	
Alignment to the strategy		Strategy formulation	
Business reviews with Exco		Benchmarking	
Customer sentiment insights		Bottom up strategy	
Key value drivers		Business roleplayers in formulation	
Use of data (KVDs) to monitor and evaluate	Operating Model	Compete in market	Digital strategy
Cascading strategy		Decentralised strategy (BU)	
Alignment		Top down strategy	
Communicate the plan		Use of data	
Easily understandable		Skills	
Misalignment		Capacity constraints	
Operating model		Digital & Change skills	
Changing operating model of banking	Operating Model	External resources	Skills
Layered levels quicker decision making		Insourcing skills for transforming business	
Digitally transformed organisations have		Key man risk	
Disconnect - Digital vs Business CIOs		Mechanisms to educate employees	
Disparate customer experiences		Technical landscape	
Drives ownership		outsourced tech	
Drives short termism culture		Interventions	
Evolving		Customer experience	
New ways of work		Customer enablement	Customer Experience
Operating model		Omni channel servicing	
Perpetuates silos			
Reliance on physical branches			

Figure 6: Emerging themes A (Proposition 1)

Culture	Culture
Communicate plan	
Enablement	
Executive sponsorship	
Guide the implementation of strategy	
Remove blockages	
Reset culture	Culture
Speed of decision making	
Culture	
Determines success of strategy	
Fail forward	
It is transforming	
Needs to be influenced by leadership	
New ways of work	
Non digital hinders competitiveness	
Not making tough decisions	
Old mindset inhibiting new thinking	
Ownership - being invested	
Quick decision making - flattened structure	
Reset of policies required	
Speed of execution	
Interventions	Architecture
Build, Test, Replace	
Detangling the legacy	
Key decisions on infrastructure	
Leverage the opportunities	
Abstraction layer	
Partnerships	
Remove customization	
Sweat existing assets	
Bimodal	Bimodal
Agile and Waterfall squads	
APIs and middleware	
Common rails and platforms	
Concurrent systems	
Creates complex architecture	
Different programming languages	
Drive digital whilst running legacy	
Slow mode for mainframe	
Core legacy systems	Architecture
Modernising architecture for easy integration	
No perceived strength with legacy	
System architecture	Architecture
Structure of IT teams	
Alignment of delivery teams	
Composition of squads not optimal	
Multi squads grouping	
Sequential dev timelines	

Figure 7: Emerging Themes B (Proposition 2)

4.4.3 Reviewing and finalisation of themes

The themes were reviewed in line with the research question and the 28 categories were classified into 6 themes. The initial codes together with the categories were used to identify patterns in the data. The final themes are depicted in Figure 8.

1. Culture	Needs to be influenced by leadership
	New ways of work
	Not making tough decisions
	Old mindset inhibiting new thinking
	Reset of policies / governance required
2. Digital Strategy	Digital vs IT strategy
	Customer Experience
	Focus area
	Defining digital
	Framework of strategic intent
	Strategy Alignment - BUs
	Data competitiveness (use of data)
3. Operating model	Monitoring and evaluating
	Operationalise strategy
	Bedrock program
	Book of work
	Custodian of the plan
	Role of leadership
	Roles and responsibilities
4. Skills	Digital, IT & Change skills
	Key man risk
	Mechanisms to educate employees
5. Architecture	Legacy systems
	Automating backend processes
	Maintenance cost
	No documentation
	Slow speed to deliver
6. Legacy modernisation	Abstraction layer
	Orchestration layer
	Agile and Waterfall squads
	APIs and middleware
	Drive digital whilst running legacy
	Multi squads

Figure 8: Final themes (Proposition 1&2)

The prevalence of each theme was considered in the determination of final themes. The final identified themes were (1) Culture, (2) Digital Strategy, (3) Operating Model, (4) Skills, (5) Architecture and (6) Legacy modernisation. A thematic map reflecting the relationships between the identified themes is reflected in Figure 9.

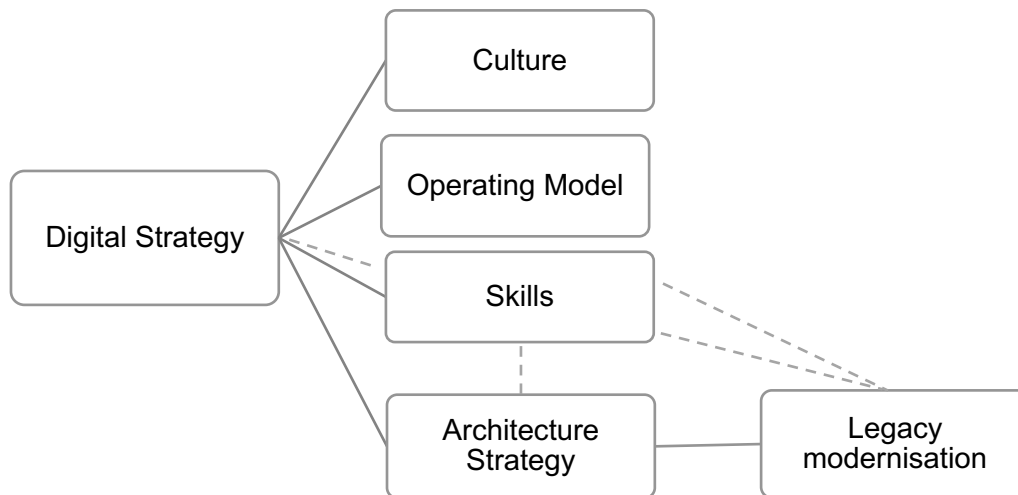


Figure 9: Thematic Map

4.5 Results pertaining to Proposition 1

Digital transformation involves more than technological enablement of a traditional business using digital technologies; it requires rethinking of the entire business model and how the organisation functions operationally.

To test this proposition, the findings from the interviews were analysed using the thematic analysis process. The research instrument introduced in Chapter 3 was used to address the topics of digital strategy formulation as well as implementation in a traditional retail bank. The primary data was collected using face to face interviews with the target audience being senior leadership across the Retail business.

4.5.1 *Digital strategy*

The research instrument did not test explicitly for definition of digital transformation, but the understanding of the phenomenon has emerged in the responses given to the various questions posed. This sub-theme came up strongly as the digital strategy theme was explored. It was noted that disparate views exist in the bank on what is regarded as digital.

There is limited evidence that a common understanding of digital transformation exists on the senior management level. Some of the views presented considered the digital transformation of the ecosystem, whereas others refer to channel enablement as described by P14 in the response below.

“Where we're talking about app, when you hear people talk about digital that's what they mean.” – P14

The disconnects are further exacerbated by the use of different terminology in relation to digital in the organisation, the context of which does not seem to be clearly articulated. Respondent P7 acknowledged the presence of digital in the strategic intent but believes that the bank is yet to define what this means internally. This is also evidenced by the varying descriptions associated with the term digital.

“So, they've got the term up there. I don't think they know what it means and I'm not seeing it an execution” – P7

“But I think there's a lot of communication still to happen in digital, it means different things, to my earlier point to say, which part of the value chain am I talking about, whether the user interface of the customer, am I talking about the optimisation.” – P8

At this stage, the term digital is used synonymously with channels, technical enablement, and the back-office digitisation processes. The maturation relating to the understanding of digital does exist in pockets of the organisation. In those cases, the considerations of digital transformation transcend the self-service channels. Digital transformation considers more than the channels but the entire business model, including processes, systems, and people. This is a reflection that the organisation is still on a journey and that there is a need to create awareness on these concepts.

“For us, the digitising agenda is multiple folds, you know, it is how do you create revenue pools? How do you get more customers? But, also it's a very big efficiency play” – P2

From the responses received, the emerging definitions relating to digital can be summarised as:

- Being digitally led
- Adopting a mobile-first strategy
- Enabling customers to self-service on bank offerings using the mobile app and internet banking (channel)
- Digitisation of the operations thereby creating efficiencies
- Creation of new revenue pools
- Change in business model to adopt to digital era

In the absence of a standard definition across the bank, incumbents are defining the terms for themselves, resulting in inconsistencies. There is a strong need for alignment in the bank on key concepts and meaning of the banks' digital strategy to ensure implementation aligns with the strategic intent.

Notwithstanding the varying understanding of the phenomenon of digital transformation, a commonly held view by the respondents is that digital is at the centre of the bank strategy. The bank does not have a separate digital transformation strategy, but the main strategy is to digitise. Digital is a key pillar and ambition for the organisation, and it is seen as one of the key outputs of the strategy. This is evidenced by the inclusion of digital in the bank's strategic intent through the use of terminology such as 'digitise', "digitally-led," and "digital business".

"All the new things that we are developing for future (longer than 18 months) is looking at how we can compete digitally. Because the bulk of our competition is coming through via digital means, which means whatever our mechanisms for being able to compete have to be digitally enabled" – P1

The organisation acknowledges that it has not reached the tipping point when it comes to the creation of digitally native solutions. The strategic intent of the bank is defined in the corporate strategy, and the business units translate the strategies into the business unit, hereafter BU, digital strategies. The product / BU strategies provide an outline of the execution plans based on the defined RBB strategy.

“I don't think anybody can say we're really leveraging our data to, to the levels that we could. Are we leveraging superficial parts of our data? Yeah, but we've got massive amount of data everybody concedes on that.” – P2

There are conflicting views regarding the extent to which the bank has leveraged data abundance in the strategy formulation. The commonly held view is that external data was leveraged, but the point of contention is regarding the use of internal data, which is believed to have been limited. Selected respondents believe that the strategy was compiled agnostic of the rich data the institution sits with. The legacy infrastructure that the bank has formed part of the inhibiting factors, which makes it difficult to query internal customer data. Some of the respondents concede that the ability to leverage the data will aid in competing in the banking industry.

“So, the reality here is you cannot run before you can walk” – P6

It is also believed that the bank is trailing the market on customer-facing digital innovations. The strategy is focused on fixing the business and catching up on the market in Horizon 1. This focus is seen as enabling the mobile-first and digital self-service capability for customers. To gain efficiencies, technology such as robotics and artificial intelligence (AI) is used to automate non-empathy tasks. The main aim of automation has been to gain cost efficiencies and improve customer experience. The digital transformation journey has not yet reached maturity, and it is noted that the organisation still needs to fix the existing technical landscape before transforming. Additionally, there is a need to understand the current lay of the land in order to come up with feasible digital solutions.

“So, I don't start by picking the technology, I thought about what is what I want to do and that is what is my proposition? What is my proposition in the digital world? How that is differentiated? And then how do I deliver that to the customer, and then the rest will follow.” – P7

“Our key transformation focus is customer experience” – P4

While different views emerged on the focus areas for the digital transformation agenda, the respondents all say that digital technology is used as an enabler for

the strategy. Traditionally, the digital strategy in the organisation was led by technology, but this has since shifted, and technology has become an enabler to the strategy. As such, the IT strategy supports the intent of the organisation to digitally transform.

4.5.2 Operating model

Bank X operates a federated business model where individual BUs set their digital strategy in response to the corporate strategy. A framework is set at the group level which outlines the strategic intent of the organisation. Based on this framework, the individual BUs formulate their strategies. There are two contrary views that emerged regarding the operating model but common between both is that the operating model is evolving. The one view is that it allows for product houses to have end-to-end ownership of their business and thereby influence how the digital strategy should be implemented. The other view is that the decentralisation of the digital strategy results in disconnected digital transformation strategies.

“Our organisational structure makes it very difficult for us to have a true digital strategy” – P7

“If you look at our peers, and you look at even in other industries, companies who've managed to do this successfully, it's always better when, you know, it's one agenda and coming from the top” – P14

According to the former group of respondents, the operating model opens itself up to inconsistencies due as the digital agenda is not driven from the centre but in the different BUs. Some of the gaps cited are duplications in execution, disparate customer experiences and inefficiencies.

The latter view on the operating model is that it gives the BUs the ability to respond digitally to the needs of their business and their customers. It is believed that this model allows the product heads to manage their silo business imperatives. Custodianship of the collective digital agenda does not seem to be

clearly understood and this is exacerbated by the differing digital maturity levels of the individual business units.

“It was well executed. And it went back to the board, for sense check. You know, where then the RBB leadership took it back to the board to say, look, we've taken Group strategy, we've done a bottom up, and this is how we see it aligning with the group strategy... Check and challenge and a bit of amendments. So, it was a well-executed and coordinated process.” – P14

Despite this view, some respondents believe that the strategy cascade process is well managed and that alignment to the RBB strategy was constantly maintained. P14 refers to the process as well executed and coordinated. Based on the overall feedback, it appears that the disconnect occurs in the execution of the strategy rather than the formulation.

“It's fundamental obviously, as with any strategy, you need to lead from the top, you need walk the talk” – P4

Leadership plays a pivotal role in leading the formulation and execution of the strategy. The sentiment is that the strategy needs to be led from the top. The alignment of the strategic execution is also a role attributed to the leaders of the business. The respondents referred to the layering process that happened allows for leadership to be closer to the execution and for decision making to happen quicker. It is also important to communicate the vision with all employees; the perception is that this is being done. When it comes to the clarity of roles and responsibilities on other levels, this is another area where gaps exist. The lack of maturity in the operating model has a direct impact on the clarification. The onus is on the leaders to guide the implementation including the roles and responsibilities of all incumbents.

The execution against the strategy is managed through what is termed a 'book of work' process. Here, strategic programmes and projects are prioritised, and the performance is tracked until delivery. The transformation programmes reflect the organisations' investment to the strategy. Work has been done to ensure that the prioritised programmes are in line with the strategy. The performance of the strategy is measured using defined key value drivers and the monitoring occurs

on a monthly basis. Opportunities exist to review the strategy annually through a formalised process in line with financial planning.

Notwithstanding, a commonly held view in relation to the implementation of the digital strategy is that the bank does not have a good track record of execution. The coordination across the value chain seems to be a challenge; this is influenced by the legacy of the organisation and the silo approach to driving change.

“We haven't been good this year at executing that and that's what I laugh at because what operational plan. But it doesn't mean that we don't have one that just means that we've been poorly executing on it.” – P11

An acknowledgement that's been made is that the legacy does not just refer to systems but the ways of work and the history of the bank. As an institution that has been in existence for many years, the culture, systems, processes and policies have been built up for many years and the challenge has been in reversing that.

“When I say legacy, not just the systems and legacy ways of work, legacy where we come from, and it's actually quite interesting...” – P11

Concerns have been raised on the level of coordination that is in place in relation to executing against the plan thus posing execution challenges for the bank. To mitigate the execution gaps that exist in the organisation, a programme by the name of *Bedrock* has been introduced. The programme is aimed at improving execution planning, improve strategic alignment in the business, driving execution discipline across the Retail business and creating common rails across the strategic projects to ensure consistency. The key acknowledgement is that the journey is evolving, and the organisation is on a process of learning as it transforms.

“The discipline we're trying to bring in now through the Bedrock programme, next year will be the main control mechanism to see whether what we're landing is on time, on budget, at the right quality and actually delivering the business case and the customer engagement that drives that business case.” – P8

4.5.3 Skills

Change management and IT skills have been identified as the key skills that will support the successful implementation of the digital transformation strategy. The study found that a delta exists between the skills required in a traditional organisation and those required to enable the digital transformation. A need for a bridge between the two world is required as the bank traverses the transformation journey. Capacity, shortages and capabilities were some of the terms that the participants commonly used as the execution of the strategy was explored. The general perception being that the skills are either inadequate or not available in the organisation.

“From a people perspective, there is a there's a dexterity gap that I am from worried about.” – P2

“If I look at some of our change capabilities, sometimes our demand always far exceeds what we've got available in terms of supply of resources” – P1

The organisation has identified a number of key capabilities that need to be enabled as part of the digital transformation strategy. The challenge posed by some of the participants relates to the capacity available within the organisation. There are finite resources available and that has a direct impact on the amount of change that can be landed.

It was also highlighted that a skills gap exists within the organisation. This a function of the old operating model whereby certain capabilities relating to driving Change Management and the implementation of projects were outsourced resulting in dexterity gaps within the bank.

“Pro-fees, whatever we call it, and then in Bank X terms, but it's interesting that also even with Change, we've had a lot of pro-fee type people that are driving Change, but actually Change is going to be here for as long as we want, it's gonna be part of what we do” – P6

The result of the outsourcing is higher costs to drive execution as well as over-reliance on external resources, further exacerbating the internal skills gap faced

by the organisation. The capability is acknowledged as key in the transformation of the organisation and the participants therefore believe that the bank should be building an internal skills base. An important challenge highlighted by the participants relates to the key man risk that is introduced by the legacy systems running in the organisation. The reliance on programming skills such as COBOL that are not easily available in the market opens the bank up to further skills challenges.

“That's the other challenge, because skills are rare, those skills are probably retired years ago and you still need to, you know, try and consult in those skills and improve on them. The newer generation, millennials and so forth are not interested in that old tech” – P13

The maintenance and replacement of the bank infrastructure becomes a challenge due to the reliance on proprietary skills. As a bank driving digital transformation, Change is an inherent part of the process. It is therefore noted that the shortage of these associated skills poses a challenge to the execution of the strategy. Lastly, it has been raised that a role that bridges the business and IT world is required. This would be done by way of translating the requirements in a language meaningful to each; the articulation is seen as a key part of managing the execution against strategy.

4.5.4 Culture

Possibly the biggest impact to the digital strategy is the culture of the organisation. Respondents unanimously acknowledged its impact to the successful implementation of the strategy. The organisation is introducing new ways of working which foster accountability and control of the business, this includes mandating employees to make decisions and to perform functions in line with their roles and responsibilities. This is seen as a shift from the previous command and control culture that was prominent in the organisation.

“And that is against the core of what you refer to as culture, which is really around the ways of work, right. So, for me, that is important because if anything, that's where, you know, that that's going to determine whether you succeed or not.

Because if, doesn't matter how brilliant individuals you have in the system, if they can't come together and solve some of these very complex problems, that are part of a full ecosystem, then you're not going to do to succeed.” – P6

The importance of culture supersedes that of a clear strategy to some extent. It is believed that an organisation can still thrive based on an enabling culture even at the absence of clear strategic direction. A culture that allows empowerment and problem solving is seen as important for the transformation journey.

“Though culture is an enabling capability to deliver on strategy. But culture on its own, can deliver results even if I even if the strategy is not clear, but as long as the culture itself encourages, that kind of thinking, and deep space to people to be able to innovate digitally, to innovate in line with the strategy. So that's how I see culture enabling strategy.” – P10

Culture impacts the daily operations and how employees' function. Leadership is identified as a key role player in driving the culture from the top. It is important that the digital transformation strategy is driven by bank leadership to enable the necessary buy-in. The respondents hold the view that the role of leadership is to reset the culture, provide strategic direction and unlock the challenges to enable the business to implement the strategy effectively. It is also important for leadership to communicate the plan in order to have a common understanding of the vision of the organisation. Leadership needs to align the policies for agility and problem solving.

“If you don't have leadership, sponsorship, drive, communication, you know, then it fizzles out pretty quickly.” – P8

The culture that the respondents believe is required is one that is enabling and allows for learning to occur. Learning comes with mistakes and failures and the culture has to have tolerance for that. A vital part of driving digital transformation is allowing room for incumbents to fail fast and learn from the mistakes made. Enabling a culture of failing forward is therefore important in a learning environment.

“I always preach this, fail, fail forward, take learnings, fail fast comeback redo and move on. So, for me, that's the role of leadership” – P10

The legacy nature of the bank results in a culmination of different schools of thought inside the organisation, that being the old and the new. The result of which are the different ways of working that each school brings into the bank. The old mindset is seen as an challenge to transformation as there are established ways of working which are not necessarily in-line with digital transformation.

“So, if you have a very old in primitive culture, in my mind, then you're going to struggle to move forward, because you're still stuck in a culture that says you can't do the but you don't really challenge that as to why, you know.” – P14

In an aim to close the gap caused by digital transformation, some mechanisms are in place to educate employees albeit in pockets of the organisation. Some of the interventions in place are channel specific, where employees are given information about the services available on digital channels and how to assist customers to adopt these. That being said, there are attempts to digitise the ways of work internally and this is believed to be one of the ways to change the ways of work in the bank. Use of technology such as Workplace by Facebook, is an attempt to bridge this gap.

“We have good platforms like Workplace being an advanced communications platform, building that hype around new ways of working, new ways of doing things as opposed to stuck in your paper-based and manual ways of doing things.” – P13

4.5.5 Conclusion on proposition 1

Formulating a sound digital strategy that clarifies the vision and strategic intent of the organisation is important however, there is an emerging need to define what digital transformation means for the organisation. Successful digital transformation ought to be supported by an enabling culture, operating model

and strong leadership in order to thrive. The dexterity of the workforce is an important element of the execution as change needs to be driven by skilled staff. The operating model of the organisation needs to be fit for the digital era and support the implementation of the digital transformation strategy. It's important to clarify the custodianship of the digital transformation plan and what everyone's role is in driving the change. Although digital transformation transcends just the technology, legacy systems are an inhibiting factor as the enablement of the digital agenda is largely supported by technology.

4.6 Results pertaining to Proposition 2

Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.

To test the second proposition, the results of the interviews conducted were analysed using the thematic analysis process. As done with Proposition 1, the research instrument was used to addresses the emerging themes of the impact of legacy systems.

4.6.1 Architecture

The organisation runs a number of different systems, some of which are core banking systems and others ancillary systems. The complex infrastructure the outcome of a merger between traditional banks with no system replacement. As such, the current architectural landscape lacks common rails that allow for the developers to code once and use the code multiple times.

"We've got fragmented or very separate systems because of the amalgamation of all the old banks put together." – P11

"Because of the amalgamation of different systems as you know, banks have converged over time" – P5

The legacy architecture is recognised as a system of records for the organisation wherein the main processes run. Respondents believe that the systems that underpinned those old banks still run in the bank thus creating a complex

infrastructure that has been referred to as 'a spaghetti' of systems. The impact of legacy systems came out strongly as respondents cited the challenges of implementing digital transformation in a traditional bank. The challenges noted have been identified as:

- Ability to scale
- Speed to execute
- Customer Experience
- Inefficiency
- High running and maintenance costs
- Complexity of architecture
- Instability

"I think we've got a lot of overly complex functionality that's been built over the years, anything like that, an intricate integrated system. So, whenever you need to make a change, you need to make in many different places." – P7

To further exacerbate the complexity, the mainframe systems were coded using old programming language, which are not as common in modern day. The legacy systems present a number of risks for the bank such as key-man dependency from a development perspective. The lack of documentation on the legacy systems' code makes it challenging to deploy changes or decommission the systems without introducing new risks.

"Stuff is not documented and you figuring out as you go along. In some instances what you find is people say that just switch it off for a couple of days" – P2

In order to manage the complexity and risks to the mainframe, the development cycles are more protracted than the market, slowing down execution. The technology teams have to conduct high levels of regression testing to ensure that the changes made do not have a negative impact on other processes. Lastly, the complexity of the architecture has a negative impact on the release cycles as they are longer to allow for the necessary analysis and testing to be conducted. That being said, a commonly held view by the participants is that the bank has similar challenges to its peers as it relates to legacy systems.

“But I think if we if we compare ourselves to, you know, the Big Four or the Big Five, I think we’re in a, in a very similar position” – P12

The true acid test lies in the experience of customers as that is one of the core drivers for the digital transformation strategy in the bank. When asked about leveraging the legacy as a strength, conflicting responses were presented by the respondents, where a number of them could not identify any instances where the legacy could be leveraged as a strength.

“I don’t see any except maybe taking learnings from that, learning what not to do?” – P10

“I don’t see it. It’s not practical, you know. In my opinion based on my experience at the bank, we need to change we need we need a new architecture from a from a system point of view.” – P14

Taking a more optimising approach, some respondents cited the stability of the system as a possible strength and referenced the fact that they still run the bank using these legacy systems which in itself is a form of leveraging. The legacy systems have the ability to run large volumes of transactions due to their processing power and capacity.

“We are, we still existing as a bank, even within our legacy infrastructure and systems, right? We’ve been able to, we’ve been able to work around those, those constraints and being able to do that and still deliver” – P13

“So, which is, that’s exactly what we’re doing now... So, what we’re saying is, as we are fixing, we know that there’s a lot of good things that live in our ecosystem.” – P2

While the bank has a clear digital agenda, key decisions need to be made on architecture which will inform the long-term strategy on the systems. Some respondents referenced one of the big four banks in South Africa as an organisation that made a decision to replace the core legacy systems, this however is not a clear directive for Bank X.

4.6.2 Legacy modernisation

There is no clear directive or plan to replace the current legacy systems with new core systems in the organisation. To aid in the digital transformation of the bank, a number of interventions have been adopted to mitigate the impact of the existing legacy. The cost of replacing the core legacy systems is immense, however the respondents mention that the bank is replacing some of the non-core systems. The interventions currently being implemented are:

- Working on understanding the complexity that the organisation sits with. This process has been referred to as 'detangling' the legacy, it involves understanding the current infrastructure before modernisation can occur.

"So, part of part of the IT re-stack is exactly that. It is, let's go back and let's go understand. If we if we say we want to get to a level of cleaning up in a bit of untangling." – P2

- Making use of orchestration layers, abstraction layers and APIs to bridge the gaps caused by legacy and developing common rails between the products systems. These layers allow for flexibility which support interoperability of the multiple systems.

"There's ways to build abstraction models and abstraction is around that servicing environment that that is common amongst all the different lines of businesses" – P13

- Removal of the customisation that sits in the legacy systems and building this onto the abstraction layers thereby reducing the flexibility. The abstraction allows for coding to be done outside of the mainframe system and removes the customization of the system, returning it to a vanilla state.

"So, everything new we build, we put input this flexible layer that sits on top of and we reduce the amount of investment into the legacies. In fact, we wanna reduce the complexity that sits on those systems... Take them into these new layers on top, which is a lot more flexible, to streamline the legacy systems so that they can do what they're good at, which is processing high volumes at speed

at a decent cost with great resilience and then they start adding value in terms of the broader architecture.” – P8

The aim of this approach is to develop common rails across different products that currently sit on different systems. The outcome of this approach will be a simplified architectural framework that reduces development cycles.

Respondents have highlighted that the legacy is not just on the systems but in the ways of work as well. Due to the complexity of the ecosystem, the formation of the squads and the manner in which they work needs to be adapted to support the modernisation agenda. It has been noted that there are three layers that need to align to enable successful delivery of digital innovation. To support this, there is a need for the various squads to align delivery times and ways of work to support timeous delivery.

“There's sort of three layers that need to line up before you can deliver something digital in particular is: You need the capacity and the skills on the front-end systems, then the sort of middleware, then the hard-core legacy mainframe product systems” – P8

One of the strategies that have been previously explored is a disruptor model where a new digital bank can be formed within the existing legacy bank with an aim of replacing the legacy with the digital. This is not a widely supported initiative, some of the reasons being the cost and internal constraints that would inhibit this approach. It was previously tested in the old operating model and had failed.

“The bank tried to build a disruptor model outside of the normal bank, through the Bank Y virtual bank but it didn't work.” – P8

4.6.3 Conclusion on proposition 2

The challenges presented by legacy systems include complex architecture, speed to execute, high cost and risk. Organisations running legacy systems need to mitigate these challenges by developing clear architectural strategies. Due to the high cost of replacing the core legacy systems, interim legacy modernisation

solutions such as the development of orchestration layers, use of APIs, and common rails are used to reduce the legacy's burden. This needs to be supported by changes in the ways of work and an adequate skills base to enable drive successful implementation.

4.7 Summary of the findings

Proposition 1: Digital transformation involves more than technological enablement of a traditional business using digital technologies; it requires rethinking of the entire business model and how the organisation functions operationally.

Proposition 2: Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.

The pivotal themes emerging from the findings is that digital transformation involves more than technology although technology is a key part of the transformation journey. The ways of work (culture) of the organisation make inroads to successful implementation of the digital transformation strategy. It is important for the organisation to clearly define what the digital transformation journey entails and the supporting competencies that allow for the journey to thrive.

Culture is a key part of the transformation journey and there is a strong reliance on leadership to drive an enabling culture in support of the implementation of the strategic intent. This has to be viewed in the context of the digital maturity of organisation. The strategy cannot thrive without the necessary skills and competencies to execute on the plans. Moreover, the operating model of the organisation underpins successful execution.

Driving digital whilst running legacy infrastructure is an inhibitor to digital transformation. This challenge is evident through the slow pace of delivery, high cost of maintenance of the legacy systems and the dexterity gaps posed by the use of old programming languages. Replacement is not an easy decision due to the cost and risk associated.

In an aid to overcome these challenges, organisations employ various modernisation strategies to mitigate the negative impact of the legacy. Such strategies include making use of abstraction and orchestration layers which use newer programming language and allow for common development rails thereby reducing delivery times. This is a form of bimodal strategies where the organisation can run different modes of technology whilst trying to digitise.

CHAPTER 5. DISCUSSION OF THE FINDINGS

5.1 Introduction

This chapter is an analysis of the research results presented in Chapter 4. From the analysis conducted, table 3 below reflects the themes that were formulated relative to the research questions and propositions.

Table 3: Research questions, propositions and final themes

Research Question	Proposition	Themes
How traditional banks formulate digital transformation strategies?	Digital transformation involves more than the technological enablement of a traditional business using digital technologies; it requires rethinking of the entire business model and how the organisation functions operationally.	(1) Digital strategy
How traditional banks implement digital transformation strategies?		(2) Operating Model
		(3) Culture
		(4) Skills
How the traditional banks manage the inhibitions caused by legacy systems on their digital transformation strategies?	Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.	(5) Architecture
		(6) Legacy modernisation

The approach followed is to highlight the main insights derived from Chapter 2 and overlay the results emanating from the empirical study. The results are presented in relation to the proposition which considers the research questions quoted above.

5.2 Discussion pertaining to Proposition 1

Digital transformation involves more than technological enablement of a traditional business using digital technologies; it requires rethinking of the entire business model and how the organisation functions operationally.

5.2.1 *Digital strategy*

One of the emerging themes from the empirical data is that the definition of digital transformation is not widely understood in the context of the organisation. According to literature, the phenomenon is often misunderstood in organisations (Ismail et al., 2017; Osmundsen et al., 2018), where the focus is placed solely on enabling technologies without considering broader strategic decisions (Kane et al., 2015).

The data collected reveals that the term digital is often used to describe digitisation of the technology infrastructure through the modernisation of the legacy infrastructure or the enablement of customers through digital self-service channels such as the mobile app and online banking. Terminology, such as digitally-led and mobile-first, is used interchangeably with digital. Furthermore, there is minimal evidence of a common understanding across the enterprise of the phenomenon.

Digital transformation refers to a significant change in a company that is underpinned by digital technology resulting in the modification of the business model of the organisation (Hess, Matt, Benlian, & Wiesböck, 2016; Osmundsen et al., 2018). According to Chanas (2017), it is not sufficient to merely introduce new technology without a fundamental change in the business. The transformation permeates multiple disciplines in the organisation and results in a change in how business is conducted.

Based on the data collected, there are pockets in the organisation that consider the broader definition of digital transformation, which considers digitisation, generation of new revenue streams, and a change in the business model. This definition considers the entire business value chain and how digital technology fundamentally changes how the organisation operates.

Customer needs are changing, thereby necessitating a change in how traditional organisations operate. The rate of change in the banking industry requires a change in business processes, products, and organisational structures (Reis et al., 2018). Digital technology ought to become an integral part of business operations, and companies need to reinvent their business models to compete effectively.

The digital transformation efforts at Bank X include the review of the current processes and infrastructure to digitise. Robotics and automation are some of the interventions being utilised in order to re-engineer the business processes. The key focus areas include efficiencies, improved agility, and customer experience. A keyword that is commonly used to describe the transformation journey of the bank is 'evolving,' thus acknowledging that the digital transformation is work in progress.

On the other hand, Sia et al. (2016) contend that merely aligning the IT and business strategies is not sufficient; the technology needs to be entrenched into the operations of the bank. The findings reflect that the case bank has outlined the digital intentions in the strategic framework of the bank. The digital strategy is found in the business strategy and is not embedded in the functional IT strategies, which aligns with where the market is going. The bank acknowledges the changing landscape that it operates in, and the key focus area of the digital strategy is customer experience. There are deliberate efforts to enable customer self-service channels on digital platforms to meet changing needs.

According to literature, it is recognised that digital transformation complexity transcends that of IT enablement. There is a definite requirement for leadership steer, change in ways of work, and the effective use of systems to compete in the market (Ismail et al., 2017). The study reflects that the organisation has changed

how it is structured in an effort to implement the strategy effectively. The bank strategy seeks to gain a competitive advantage, albeit that the Horizon 1 ambitions of the bank are to fix the operations.

5.2.2 Operating model

Who is responsible for driving the digital transformation strategy in an organisation? According to literature, this role is typically fulfilled by CIOs, but a new role has emerged in the C-suite that operates as a transformation catalyst for organisations (Horlacher & Hess, 2016). This role is termed the Chief Digital Officer (CDO) and is not seen as a replacement for CIOs but rather a synergetic capability. Two senior leaders driving transformation can result in misalignment in strategy and execution.

The results indicate that Bank X uses a different model; the digital transformation agenda is driven by business leaders and is enabled by the CIOs and technical teams. The challenge noted, however, is that the existing infrastructure requires deliberate IT interventions to the solution and can negatively impact the digital transformation efforts if not adequately addressed.

“For example, my responsibility as CIO is more of an order taker than to transform surprisingly.” – P4

The question of custodianship of the digital strategy has no clear answer, which is an indication of the maturity of the operating model. Moreover, this results in misalignment due to a lack of a central role connecting the dots. The business heads who own the digital strategy for their products have a robust product-monoline focus, which perpetuates silos in the implementation of digital transformation. Although the organisation has a C-suite role that looks after digital enablement, the role supports the business-led agenda, thereby opening the organisation up to potential gaps in execution.

Literature uncovers that the creation of distinct governance that fosters collaboration and transparency of change initiatives is imperative for the digital transformation journey (Chanias, 2017). Formation of a digital transformation

strategy is only part of the challenge; the difficulty comes with execution. Successful implementation requires an understanding of customer needs and underlying processes that support the implementation (Loonam et al., 2018). The study shows that the bank is faced with an execution challenge with the strategy. To close this gap, the company has introduced a new strategic programme under the name 'Bedrock' that is targeted at strengthening the strategic alignment in the business verticals, execution governance, and the speed of execution. This is a central capability that will oversee change execution across the Retail business and aid in the implementation of the strategy.

5.2.3 Skills

Companies should review the need for developing a collaborative work environment and ensure that the transformation project is staffed correctly (Ismail, Khater, & Zaki, 2017). Some scholars argue that the improvement in technology cannot yield the required results without upskilling the workforce (Cingillioglu, 2017). Historically, organisations focused on advancing technologies and not in the organisational competencies that result in the execution. This has led to unsuccessful implementations due to organisations not doing the work to change mindsets and processes that promoted change (Kane et al., 2015).

The study results show that one of the competencies that impact execution in the organisation is the skills gap. Change and IT skills have been flagged as the essential skills that are lacking in the organisation. In some instances, these dexterity gaps open the bank up to key man risks. Traditionally, the organisation used external resources to drive big programmes, and this left a gap in the internal competencies.

There is a need to build an internal skills capability that will support the implementation of the digital transformation strategy for the institution. Equally important is a role that plays the role of a 'modern-day modem' in the organisation, that is, a role that translating business requirements and technical jargon for the professionals who need to support the execution. A gap exists when

it comes to upskilling the workforce, this was acknowledged that this exists in pockets, and there is no companywide intervention in place to upskill the workforce.

5.2.4 Culture

Having noted that digital transformation requires more than incremental changes to the business, emphasis on the change management element supporting the journey is significant. This requires a view of matters such as power dynamics, culture, and conflict resolution in the organisation (Osmundsen et al., 2018). Agile culture and an engaged workforce have been highlighted as imperative for a business's digital transformation (Osmundsen et al., 2018). It has been found that the key differentiator between organisations leading and those lagging digital is a clear digital strategy underpinned by a culture and leadership composed to drive the transformation (Kane et al., 2015). Moreover, research shows that a clear digital strategy distinguishes leaders in digital from the rest, coupled with a culture that enables digital transformation (Kane et al., 2015).

The research findings corroborate this; culture has been highlighted as having a significant impact on the success of the digital transformation strategy. The introduction of new ways of working in the bank is an effort to redefine the culture of the bank. Having a conducive and enabling culture has been rated as more important than the strategy itself. Poor culture can erode the successful implementation of a sound strategy.

The pace of change required in the digital era dictates that organisations increase the execution speed to maintain a competitive advantage. Leadership intervention is required in driving the required culture and enabling the organisation to implement the strategy successfully. Leaders are in a pivotal position to create and embed the culture in an organisation (Schein, 2010). However, it is acknowledged that growth will come with the variations of subgroups, causing the formation of subcultures (Schein, 2010). Initiatives that do not have leadership sponsorship do not get the required buy-in. Concerning failing, the respondents highlighted the importance of allowing for failing and learning in order to grow.

5.3 Discussion pertaining to Proposition 2

Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.

While the digital strategy needs to make provision for more than the digitisation of the legacy systems, it is understood that the legacy systems are an inhibitor to the effective digital transformation of an organisation. As such, strategies such as legacy modernisation are used to bridge the gap between the traditional and digital bank.

5.3.1 *Architecture*

As organisational systems become connected, both internally and externally, the interdependence between the systems occurs. That increases the complexity of the system, making it challenging to decommission or replace (Gangadharan et al., 2013). Legacy systems are cited as the biggest inhibitor for traditional institutions competing with digital natives (Avedillo et al., 2015).

Crotty & Horrocks (2016) define legacy systems as systems that are key for business continuity and have one of the below characteristics:

1. Aged infrastructure
2. Obsolete programming language
3. Lack of documentation
4. Poor data management
5. High customisation
6. Inadequate support & capacity
7. Insufficient infrastructure to transform digitally
8. High cost to maintain

The data findings reveal that the bank legacy was formulated when the amalgamation of traditional banks occurred, and the core systems of each were not replaced. The architectural landscape of the bank meets all the characteristics listed above, which makes it a legacy. This is noted as one of the main inhibitors

to digital transformation as the strategy is underpinned by digital technology, albeit that the transformation is across the business model. Failure to transform the systems will result in expensive, slow, and uncompetitive infrastructure that is not easily transformed. One of the noted challenges with the architecture is the reliance on key resources who can code using the old programming languages. Furthermore, insufficient documentation negatively impacts the execution as there is no clarity about what sits in the systems. Consequently, the speed of execution is negatively impacted as changes need to undergo stringent regression testing to manage the emerging risks.

Existing literature reveals that traditional organisations are challenged with time to market due to existing processes limitations. Driving digital transformation while running a legacy impedes traditional companies. According to Avedillo (2015), running two speeds of IT is a possible workaround to manage the execution speed dilemma. This approach gives traditional organisations the ability to transform without negatively impacting the normal operations of the business (Avedillo et al., 2015).

The study results indicate that the incumbent organisation faces the challenges with running legacy while trying to transform. The result is that some respondents are unable to see the possibility of leveraging the legacy as a strength. An opposing view is held by other participants, who believe that the bank currently leverages the legacy in the current operation. The systems can process in bulk and are said to be reasonably stable. The challenge is the batch processing that the systems rely on, which does not allow for agility.

5.3.2 *Legacy modernisation*

While organisations can formulate digital strategies to compete, the challenge comes with integrating the technology into the current infrastructure (Hess et al., 2016). Organisations make use of interventions such as bimodal IT to address the challenges posed by legacy infrastructure while trying to digitise (Horlach et al., 2016). The two speeds allow for legacy and newer systems to be run. The latter allowing for quicker iterations while the legacy runs in the back end.

The incumbent organisation has no strategy to decommission the current legacy systems completely. Instead, legacy modernisation interventions are being employed to alleviate the challenges. The study also found that the application of two-speed in the organisation is nuanced in that the two speeds are applicable to the agile and waterfall squads. This is also supported by the use of abstraction layers whereby the orchestration happens outside of the legacy system. The layers allow for interoperability of code between different products that currently sit on disparate core systems. The interventions also include the untangling of the legacy and deploying in parallel to mitigate the negative impact of the legacy systems.

5.4 Conclusion

Traditional bank institutions are impacted mainly by the legacy of the institution, which shows itself in the ways of work in the organisation, the policies, the governance, and importantly in the technology landscape. There is, therefore, a strong need to understand the current landscape of the organisation when attempting to transform digitally. Unlike forming a strategy for a new bank, in an existing company, the building of a feasible and workable solution is an essential aspect of the digital transformation journey. Financial resources to digitise the organisation are limited and have to be prioritised based on the current reality and known constraints. Where an organisation elects to replace the legacy and build new systems entirely, then the transformation journey would look completely different.

Building in parallel to the existing legacy is, therefore, a method of transforming while running a legacy. This approach allows for continuity and for the bank to compete in the market.

CHAPTER 6. CONCLUSIONS & RECOMMENDATIONS

6.1 Introduction

This chapter will present the conclusion based on the research questions introduced in Chapter 1. Recommendations have been made, including suggestions for future research. This study was designed to investigate how traditional banks formulate and implement their digital transformation strategies. The second aim was to examine the impact of legacy systems on the digital transformation journey of the bank.

From the literature, it emerged that digital transformation includes more than digitising the bank but considers additional elements that ultimately challenge the entire ecosystem and business model. The pitfall that many traditional organisations fell into was making technological changes without amending the operating model or business model, and that has resulted in a fail in the so-called transformation.

Notwithstanding this fact, organisations still require technology to transform their operations effectively. The challenge that is faced by the older banks is the aged architecture that is already in place, which is core to the current functions of the organisation. As such, the transformation agenda becomes difficult as the cost, complexity, and skills need to be considered when transforming them. To curb this, traditional banks undergo a process of modernising or replacing the legacy systems while changing the business model.

6.2 Conclusions regarding research questions

6.2.1 *How traditional banks formulate digital transformation strategies*

Digital transformation is fundamentally impacting how the bank operates. The competitive market and consumer needs are some of the factors that are impacting how the bank functions. It has emerged that a critical element to

formulating effective digital transformation strategies is defining what digital means for the organisation. Literature cited the prevalence of the term in corporate settings but highlighted that it is often misunderstood. This was found to be the case in the case organisation.

The study found that digital transformation refers to different things to individuals in the organisation. The term is used interchangeably with digitisation, digital self-service channels, and being digitally led. This is in line with the literature on the phenomenon where digital transformation is said to be generally misunderstood. Bank X had no clear definitions applied for the various terminology used in the organisation, in the absence of which people have allocated their own. The disconnect can be seen to reflect the maturity of the digital transformation journey in the bank.

The formulation of the digital strategy is, therefore, on the back of this challenge. The organisation has embedded the digital agenda in the centre of the corporate strategy. It was found that digital is in fact a key component of the strategy and that there is no separate strategy for the digital transformation agenda. The key consideration for transforming have been cited as improving customer experience and agility in the organisation. It was further acknowledged that the organisation had lagged the market when it comes to digital and has dedicated the Horizon 1 part of the strategy to fix the business and catch up to the market. A strategy in itself that is transformational in the context of the organisation but can be seen as a threshold capability to compete in the market, meaning it is a necessary capability and does not give the organisation a competitive advantage.

The strategy is formulated based on a top-down approach. A strategic framework was set by the group and translated into the retail business and further into the individual business units. The approach to formulating the digital strategy was not prescribed in theory reviewed. Instead, the emphasis was placed on the nuances between IT strategy and digital strategy. These two phenomena' can easily be confused with each other and organisation are made aware of these pitfalls. It was found that the case bank has matured past this challenge. Mention was made of previous operating models where digital, and IT were centralised and informed the business strategy to a great extent. In the new construct, the IT and

digital strategies are seen as enablers to the business strategy and are managed by the business heads.

Traditional retail banks follow a systematic approach to strategy formulation. The framework is top-down and is cascaded to the rest of the organisation. The challenge found by this study is that the approach followed is that of standard strategy formulation and has not been redesigned to consider the nuances of a digitally transforming business. The strategic choices regarding the digital agenda need to be clarified upfront and consistently checked throughout the cascade process. Subsequently, trade-offs can be made on the initiatives to be prioritised to achieve the digital strategy.

6.2.2 How traditional banks implement digital transformation strategies

The study found that implementing the digital transformation strategy is a challenge for the organisation. One of the critical challenges noted in the interviews was the dexterity gap that exists in the organisation when it comes to the digital era. It was highlighted that part of the execution challenge is imposed by the shortage of key skills required to change the business from its previous legacy operating model. As mentioned previously, the bank outsourced the change and IT capabilities and, as a result, had not developed these skills adequately within the organisation.

When contrasting this skills gap with investment in upskilling the workforce, there was an apparent inconsistency in the efforts being applied across. In pockets, work is being done to educate employees on the skills required to operate in the digital age. It was acknowledged, however, that this is not done across the organisation. The respondents shared that the current approach focuses on creating awareness of digital change initiatives that have been implemented rather than re-skilling for the digital way of life.

Culture plays a vital role in the successful implementation of the digital transformation strategy. A disabling culture can act as an antibody to the strategic intent due to factors like resistance to change, legacy ways of work, and fear of

making mistakes. An enabling culture has the ability to catapult the organisation and aid in support of the strategy. The literature and the study found that leadership plays a crucial role in influencing the culture of the organisation.

The organisation has a legacy in both the systems and the ways of work. This means that the systems, skills, policies, culture, and business model need to transform. The legacy system challenges can shift focus to digitisation at the expense of the broader application of digital transformation. Due to these noted challenges, execution against the strategy was focused on fixing the business in the first horizon with strong emphasis on the enabling technology. This, in itself, can exacerbate the definition challenge resulting in incumbents focusing more on the technical aspect of digital transformation at the expense of the business model and ways of work elements.

One of the respondents' insights regarding the operating model was that it was evolving; it was still relatively new and had its challenges. A factor cited regarding the operating model was the perception that it was perpetuating silos within the bank. The operating model requires ownership of the digital strategy to sit with the individual business units.

The traditional bank institution grapples with the execution against the strategy due to several factors. The balance between exploiting short term wins, and long-term execution is an ongoing challenge. While the strategy focuses on fixing the business in the first horizon, there is a need to transform the operations for the longer-term future. This view does not seem to exist based on the findings. The current constraints imposed by the legacy systems, ways of work, and policies are limiting factors to successful digital transformation.

That being said, it is noted that the bank cannot outperform the market without the development of threshold capabilities required to compete and therefore needs to catch up to the market. The challenge with this approach is that the market continues to progress, and there is a likelihood of continuously lagging the market due to continually playing catch up. Effective digital transformation offers incumbents a competitive advantage when done right. Incremental changes are unlikely to disrupt the market in a way that will gain this advantage.

6.2.3 *How the inhibitions caused by legacy systems on digital transformation strategies are managed in traditional banks*

Legacy systems are systems that are critical for the operation of the business. A number of the characteristics of legacy systems outlined in the literature align with the results of the study. The challenge with the legacy is the complexity of the infrastructure and the high cost to maintain. The intricate architecture makes it difficult to connect with other systems in the ecosystem, especially newer ones. There is a shrinking base of skills to maintain the legacy as it is coded with old languages that are obsolete. Moreover, the execution capability in the organisation is still at an immature stage.

The traditional incumbents in banking that are looking to transform their business digitally are challenged with having to disrupt a business model that has worked well previously. Unlike digital natives, the traditional bank does not have a clean slate in terms of technical infrastructure, and this is a crucial consideration for the implementation of the digital transformation strategy. At the absence of this new architectural landscape, a clear digitisation roadmap is required for the organisation which outlines how the old and the new will be ultimately converged in a future state.

From the study, it has become apparent that the organisation has developed interventions to deal with the challenges imposed by the legacy in the short term. These interventions allow for interoperability between the various systems in the bank and for agility in enabling the digital transformation agenda in the short term. The use of APIs, abstraction layers, and orchestration layers are some of the short-term fixes deployed to manage the inhibitions imposed by the legacy.

To aid in digital transformation, two speeds of technology are running. That is the legacy infrastructure running in waterfall methods as well as the 'faster' mode, which in the case of Bank X are the additional layers that allow for work to be done quickly to meet the customer needs. The drawback is the tactical nature of these solutions. They allow for the organisation to transform in the short term but are not strategic solutions to support the business model redesign for a future digital state that has not yet been defined.

6.3 Recommendations

1. Defining digital transformation

There is a need for strategic alignment within the organisation as it related to the understanding of digital transformation. The alignment on the definition of what is regarded as digital is the first point of departure. The adoption of new technology ought to be strategically connected to the strategic intent and aligned to the transformation agenda, thereby creating a connection between the business model, business operation, and the digitisation agenda. Technology remains a key enabler to the digital transformation of the bank, but the clarity between digitisation, digital-led, and transforming the entire business model needs to be understood well.

2. Leadership of digital

One of the key findings is that the leadership of the digital is not understood and that everyone in the organisation is ultimately the custodian of the digital agenda. The study highlights the importance of leadership in driving the digital agenda. There is a need for a senior role that owns the digital agenda but partners with the BUs to ensure alignment before execution. This will address the silo and disconnected approach to execution against the digital strategy. Horlacher & Hess (2016) introduced the role of Chief Digital Officer. There is a need for a role that harmonises the digital and IT strategy in the bank and connects the dots across the ecosystem to avoid inefficiencies and different customer experiences.

3. Re-skilling of workforce with digital skills

There is a need to educate the employees of the organisation on digital skills. As stated previously, the organisation has a legacy of systems, skills, and culture, and a deliberate effort is required to ensure that the employees can perform in the digital era. Therefore, it is recommended that the organisation forms learning programs for all employees on the essential digital competencies. This can focus on both technical and non-technical skills to close the dexterity gap. In cases where recruitment of new people is being done, the digital skills should be a pre-requisite.

4. Architectural strategy

The organisation needs to define the future state architecture and provide a clear road map on how the current and future states will converge. The current legacy modernisation initiatives will work in the short term, but as the digital transformation journey matures, the need for newer, agile technology will proliferate. Digital technology is a critical component of the transformation of the organisation, albeit that it is not the only one. As the organisation changes the business model to create new revenue streams, the supporting architecture will need to be mobilised to meet the identified strategic priorities for the bank.

5. Investment in decision support tools

It was found that the organisation is only leveraging superficial parts of the internal data that it possesses. One of the findings highlighted the importance of using data to gain a competitive advantage as this is one of the differentiators between the bank and the digital natives that have entered the market. It is recommended that Bank X invests in data management tools to support decision making regarding the transformation of the business.

6.4 Limitations

The research sample size was limited to the Retail Division of the bank and did not include other divisions such as Corporate and Investment Banking, Business Banking, and Wealth. Although the Retail division makes up the largest part of the bank by earnings, staff, and number of customers, nuances would exist in those divisions that might influence the generalisation of the findings. The study is also based on a single institution and industry and fails to consider the nuances in different contexts. Furthermore, it is the impression of the researcher that the digital maturity, architectural complexity, skills, leadership, and strategy would all need to be taken into consideration when analysing other organisations undergoing digital transformation.

6.5 Suggestions for further research

The following areas have been identified for further research:

1. When researching this topic, there were no readily available frameworks to support the digital transformation of a legacy institution. The development of this would be used to guide organisations that go through this process.
2. It would be interesting to study the impact of digitising an organisation without transforming the business model, and whether that has any impact on the successful implementation of the digitisation strategy.
3. A broader study into different operating models that result in the successful implementation of digital strategy, coupled with guidelines on effective operating models for digital transformation organisations.
4. How culture can act as an enabler for effective digital transformation
5. An understanding of the real cost of incremental legacy modernisation in organisations undergoing digital transformation.

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APPENDIX A

Interview Guide

Standard Participant Questions

1. Please state your role at Bank X.
2. What is your job level in the organisation?
3. How many years have you worked in Bank X?
4. What is the division and functional area that you work in?
5. Have you ever been involved in the development of a strategy at Bank X?

Formulation

1. Is the digital transformation strategy imbedded in the corporate business strategy of the bank?
2. Who is involved in the formulation of the digital transformation strategy for the bank?
3. What are the key digital transformation focus areas? For instance, AI, machine learning, block chain. How were these selected?
4. How is the cascading effect of the strategy managed in terms of consistency in the different levels of planning?
5. How has the bank leveraged data abundance to improve digital strategy formulation?
6. How does the fusion between digital business strategy and IT strategy occur in the bank?
7. More specifically, how do you see the role of technology in digital transformation?
8. How do you see the role of the organisations' operating model in digital transformation? Has it been redesigned to respond to the dynamism required in a digital era?
9. What do you believe is the impact of culture (if any) to digital transformation?

Implementation

10. Does the bank have an [agile and scalable] operations plan to respond to the digital strategy?
11. Is the plan aligned to the digital strategy? What indicators are used for alignment?
12. What is the role of leadership in the implementation of digital transformation of the bank?
13. Who is the custodian of the digital transformation plan?
14. Does each department have their own digital operations plan or is this centralised?
15. Are the roles and responsibilities of business and functional managers clearly articulated in relation to the implementation of digital transformation?
16. What mechanisms are in place to educate the employees on techniques to implement digital transformation (e.g.: design thinking, agile methodologies and innovation)?
17. What are the current barriers for effective implementation of the digital strategy in the organisation?
18. What is the planned time period for implementing the strategy?
19. How often is the plan reviewed? Annually?
20. What mechanism are in place to evaluate and monitor the strategy?

Legacy systems

21. How do legacy systems impact the speed of execution, if at all?
22. How do legacy systems impact the banks' competitive advantage?
23. What other challenges do legacy systems present for the organisation as it relates to digital transformation?
24. How does the bank leverage the existing legacy systems as a strength rather than a burden that's hindering digital transformation?
25. How does the organisation use bimodal approach as a mitigating factor for the challenges presented by legacy systems?
26. What other strategies are in place to deal with legacy systems in the organisation?

APPENDIX B

Consistency Matrix

Sub-problem	Literature Review	Propositions	Data collection tool	Analysis
Evaluate the strategy formulation process in a traditional South African bank institution.	Loonam et al. (2018); Osmundsen et al. (2018); Reis et al. (2018); Hess et al. (2016); Chanias (2017); Ismail et al. (2017)	Digital transformation involves more than technological enablement of a traditional business using digital technologies; it requires rethinking of the entire business model and how the organisation functions operationally.	Interview Questions: 1,2,3,4,5,6,7,8,9	Qualitative data analysis from a case
Evaluate the strategy implementation process in a traditional South African bank institution.	Osmundsen et al. (2018); Holarcher & Hess (2016); Loonam et al. (2018); Cuesta et al. (2015); Sia et al (2016)		Interview Questions: 10,11, 12, 13, 14, 15, 16, 17, 18, 19, 20	Qualitative data analysis from a case
Critically evaluate how legacy systems inhibit digital transformation in traditional bank institutions	Hussain et al (2017); Haffke et al (2017); Sebastian et al. (2017); Horlach et al. (2016); Gangadharan et al. (2013); Haffke et al. (2017)	Traditional institutions need to explore legacy modernisation strategies to manage legacy systems on the back of a clear digitisation plan.	Interview question 21, 22, 23, 24, 25, 26	Qualitative data analysis from a case

APPENDIX C

Participant Consent Form

An evaluation into the inhibitions caused by legacy systems on digital transformation in a South African Retail bank

Lukhanyiso Mantyi

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 that my participation will remain anonymous YES NO (please circle)

I agree that the researcher may use anonymous quotes in his research report YES NO

I agree that the interview may be audio recorded YES NO

I agree that the researcher may take photos of me (but not my face) YES NO

I agree that the information I provide may be used anonymously by other researchers following this study YES NO

..... (signature)

..... (name of participant)

..... (date)

APPENDIX D

Language certificate

Language Quality Assurance Practitioner

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3rd March 2020

TO WHOM IT MAY CONCERN

I hereby certify that I have language-edited the master's thesis of Ms Lukhanyiso Manti titled: INHIBITIONS CAUSED BY LEGACY SYSTEMS ON DIGITAL TRANSFORMATION IN A SOUTH AFRICAN RETAIL BANK.

I am satisfied that, provided the changes I have made are effected to the text, the language is of an acceptable standard; and is fit for publication – provided the notes I made are satisfactorily dealt with by the student and their supervisor.



Dr Patrick Goldstone

BSc (Stell.)

DEd (UPE)

Language Quality Assurance – Certification Statement