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Building dynamic capabilities that enable effective diffusion: the case of Development Finance Institutions (DFIs) in South Africa

Dlamini, Itumeleng

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Building dynamic capabilities that enable effective diffusion: the case of Development Finance Institutions (DFIs) in South Africa

Itumeleng Dlamini

Student number: 0505478e

A research report submitted to the Wits Business School in the University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Management in the field of Innovation Studies

Johannesburg, 2021

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ABSTRACT

The process of digital transformation of an organisation is associated with the strategic change of an organisation's capabilities enabled by the implementation of technological solutions. Critical to successful digital transformation are management practices in the form of dynamic capabilities, which direct the process of the strategic change.

This exploratory study seeks to understand the influence of dynamic capabilities, specifically seizing and transforming dynamic capabilities, on the diffusion of digital technologies to successfully achieve digital transformation in South African development finance institutions (DFIs), who have embarked on a digital transformation journey. The study aims to provide managers of digital transformation in organisations with insights regarding the dynamic capabilities that enable diffusion of technological innovations in DFIs and similar institutions and further contribute towards empirical research on dynamic capabilities, specifically in the context of South African DFIs. A qualitative research approach, comprising comprehensive literature review and semi-structure interviews was followed to explore the influence of dynamic capabilities micro-foundations at various stages of the diffusion process of digital technologies.

The research findings indicate that dynamic capabilities that influence the diffusion of these technological innovations. Specifically, the seizing dynamic capabilities micro-foundations that influence the innovation diffusion process were identified as (1) prototyping, (2) balancing digital portfolios and (3) building strategic agility.

The reconfiguring dynamic capabilities micro-foundations that influence the innovation diffusion process were identified as (1) navigating innovation systems, (2) internal structures reorganization and (3) improving the digital maturity through developing digital culture initiatives.

KEY WORDS

Digital transformation, technological innovation, diffusion, development finance institutions, dynamic capabilities, adoption, strategic management

DECLARATION

I, Itumeleng Dlamini, declare that this dissertation is my own unaided 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 Innovation Studies at the Wits Business School in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other University.

Signature:

On this 17th day of May 2021

Itumeleng Dlamini

Name

DEDICATION

This is dedicated to my foundation, Sello Loate – I love you Dadding. Thank you for loving me enough to show me how I was deserving of love by another. May your soul continue to rest in power.

Your daughter, Dimpo

ACKNOWLEDGEMENTS

I would like to thank all those who have supported me throughout this journey –
My husband, for the unwavering support,
My heart, Kgothatso, for being my biggest cheerleader,
My sister, Lesedi, my rock,
Pinky, your love and support give me the greatest comfort to keep going.
My friends and families, cheering me on through it all

- *I'm eternally grateful to the Most High for all of you!!*

LIST OF ABBREVIATIONS & ACRONYMS

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
CEO	Chief Executive Officer
DC	Dynamic Capabilities
DFI	Development Finance Institution
DOI	Diffusion of Innovation
Exco	Executive Committee
ICT	Information, Communication and Technology
IoT	Internet of Things
IP	Intellectual Property
IS	Information Systems
IT	Information Technology
KPI	Key Performance Indicator
NPM	New Public Management
PSO	Public Sector Organisation
R & D	Research and Development
RACI	Responsible, Accountable, Consulted, Informed (Responsibility assignment matrix)
RFI	Request for Information
VUCA	Volatility, uncertainty, complexity and ambiguity

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CHAPTER 1: INTRODUCTION

1.1 PURPOSE OF THE STUDY

With the acceleration of technology advancements across most industries, incumbent organisations have embarked on digital transformation journeys to respond to external drivers, with the aim to leverage technology to transform internal capabilities, processes and business models in order to remain competitively sustainable. Dynamic capabilities are those organisational level capabilities that are associated with responding to rapid changes in an organisation's environment. Critical to the success of digital transformation in incumbent organisations is the effective adoption and diffusion of technological innovations. The innovation diffusion process is part of the strategic change an organisation undergoes to transform digitally.

This study aims to explore the relationship between dynamic capabilities and the diffusion of technological innovations that enables successful digital transformation in an organisation. This study specifically examines the impact that seizing and transforming dynamic capabilities have on the innovation diffusion process; specifically, how these dynamic capabilities influence the diffusion process within a development finance institution (DFI) in a South African context. The aims to aid leadership of incumbent organisations undertaking digital transformation with practices for consideration in their respective digital transformation strategies and further aims to contribute towards empirical research of dynamic capabilities, especially in a South African context.

1.2 CONTEXT OF THE STUDY

The current context of South Africa presents simultaneous challenges of a country embarking on a path to join the Fourth Industrial Revolution in terms of innovation adoption, particularly technological innovations; while at the same time looking to boost economic stimulus through infrastructure development (Govender, Gumede, & Motshidi, 2011). DFIs play a pivotal role as an arm of the state to correct market

failures through financing infrastructure development whilst contending in a changing competitive landscape with other commercial players and new entrants, such as commercial banks, fintechs and other financial services providers.

Digital transformation provides valuable competitive advantages for banks (as financial services institutions, which DFIs are as well) to leverage (PwC, 2018). The success of this transformation is dependent on technology adoption. Adoption of the right technologies and their successful diffusion within the organisation ensures an enhanced customer experience, faster and easier customer interaction, as well as increased diversification of product and service offerings, which translates into improved performance for the transforming entity (Gordon Institute of Business Science, 2018). At the core of these successes is how an organisation identifies the right opportunities and appropriate technology to adopt, aligns its strategic objectives with prioritising the appropriate technologies to adopt and when to adopt them as well as being able to revise business models, capabilities and processes for purposes of achieving those strategic intentions. At the core of this is building the right capabilities for this strategic change. This study seeks to explore the relationship between dynamic capabilities and the technology diffusion process that enable effective digital transformation and aims to contribute to empirical research on dynamic capabilities from a strategic management viewpoint and the innovation adoption process specific to the state-owned entities like DFIs in a developing country.

DFI landscape in South Africa and the role of technology

DFIs are varied in mandates, financial products and operations, but there is a commonality in terms of ultimate objectives. In South Africa, DFIs are instrumental in achieving goals that aim to address the triple challenge of rising unemployment, inequality and poverty through infrastructure funding (Qobo & Soko, 2015).

Digital transformation of development finance on the African continent is imminent because of the significant growth rate of adoption of digital and mobile channels by consumers, emerging disruptive competitors with superior digital capabilities, lowering the cost to serve and increased presence of foreign investors (Coetzee, 2018). A study conducted by McKinsey suggests that the critical success factors for this end-to-end

digital transformation include the organisation having a robust digital strategy, excellent execution capabilities and the ability to add and adapt to the banks existing technology infrastructure (McKinsey, 2018).

The journey of digital transformation is not without its challenges that slow the progress that could be made:

- Banking products, specifically development finance products, are not highly ranked in some countries as critical needs;
- Access to development finance is a barrier, especially for the historically disadvantaged;
- Failures have been experienced from trying to retrofit business models/technologies from other international stakeholders in Africa;
- Governments not digitising certain aspects, e.g., social disbursements, payroll and aid disbursements

However, technology is a critical enabler to diversify products offering to meet more customers' needs in a convenient and cost-effective manner (Aghaunor & Fotoh, 2006).

The role of technology as a strategic enabler has become evident in organisation level strategies for most banking institutions. The strategic intent of technology adoption is born from the need to expand financial inclusion, responding to new entrants with superior technology and increased regulatory and operational costs (Diatha, Wentzel, & Yadavalli, 2013). It further allows for lowering of cost to serve customers, but also more precise analysis of customer needs and preferred interaction mechanisms.

Although there is a multitude of literature on technology diffusion, including theoretical models such as Rogers' innovation adoption theory (Rogers, 1995), there is limited research that focuses on factors influencing technology adoption in DFIs, in particular those in developing countries like South Africa. Poor adoption has resulted in the abandonment of technologies that organisations have made significant investments in (Abukhzam & Lee, 2017). Furthermore, there seems to be a gap in the understanding of how dynamic capabilities can influence the innovation diffusion process. This study seeks to understand the relationship between dynamic capabilities and their influence

on the diffusion process of technological innovations that organisations seek to adopt as part of their digital transformation strategies.

1.3 PROBLEM STATEMENT

Traditionally, development finance was dominated by state-owned DFIs. Recently in South Africa, increased competition from non-traditional entrants who leverage technology innovation to deliver a faster and cheaper customer experience, as well as differentiated propositions, are playing in the space of development finance. In order to respond to these potential disruptors, DFIs are embarking on digital transformation journeys. In aiming to achieve digital transformation, DFIs face multiple challenges of onerous processes and limitations brought about by organisational cultures and absorptive capacity, as well as regulatory hurdles. Critical to the success of organisations' digital transformation is the diffusion of the technological investments they make (Banning-Lover, 2015), which is reliant on the appropriate strategic management capabilities that manage this organisational change.

Researchers have analysed factors influencing the adoption of technology innovations in state-owned entities in Asian countries such as China (Fisher-Vanden, 2003) and Japan (Niehaves, 2007). There is very little literature that explores the factors affecting the adoption of technological innovations within public sector organisations in Africa, particularly DFIs in South Africa. Furthermore, there is limited empirical research on dynamic capabilities and their relationship with the innovation diffusion process, contexualised in incumbent organisations in South Africa.

1.4 SIGNIFICANCE OF THE STUDY

Development finance is taking centre stage in South Africa as a critical enabler to accelerating slow economic growth through infrastructure development (Govender, Gumede, & Motshidi, 2011). DFIs in this economy are shifting their strategic focus to digitising their operations in order to deliver an enhanced customer experience and differentiated propositions in the most efficient manner while keeping costs low. The success of these digital transformation journeys hinges on the adoption of the right

technological innovations, their effective diffusion in the organisation and continuous strategic management of the organisation's changes. Being wholly state-owned, DFIs under this study, although competing with private players, are still subject to compliance with government regulation and have public interest mandates to deliver on. Therefore, the way they build their organisational learning capability (absorptive capacity), evolve existing capabilities and transform business processes through digitalisation present unique challenges compared to their privately-owned competitors. This study explores how strategic management practices in the form of dynamic capabilities impact the diffusion of technological innovation in these organisations and seeks to contribute to empirical studies of dynamic capabilities (especially their micro-foundations and antecedents) in the field of innovation studies and organisational development and change.

With regards to innovation diffusion, this study contributes towards knowledge and practical considerations for digital transformation practitioners:

- The management of impediments to the diffusion process.
- Development of strategic capabilities and functions that positively influence digital transformation within an organisation.
- Development of effective management practices that enable the continuous evaluation of required technologies and implementation practices; and
- Developing expected benefits to be realised and managing the impact from implementing technologies and continuous improvement practices to further the effect.

1.5 LIMITATIONS OF THE STUDY

The purpose of the study is to develop a conceptual framework that considers the dynamic capabilities required to manage the successful diffusion of technology innovations to achieve digital transformation in a DFI in South Africa. The study is limited to two development finance institutions in South Africa. The study will be focused on the strategic capabilities these DFIs employ that inform their digital transformation journeys. The technological innovations considered in this study refer

to those adopted or considered for adoption in order to achieve process efficiencies and enhance customer experience through improved service or product delivery.

From a dynamic capabilities' perspective, the study will focus on seizing and reconfiguring dynamic capabilities. Most incumbent organisations have begun their digital transformation journeys, including the research of opportunities. The study will therefore focus on how these entities take advantage of the identified opportunities and embed them into the organisation from a people, process and technology perspective and how business models are evolved to align strategically.

The study involves an examination of the adoption of already existing (not necessarily new to the industry) technology innovations at an organisation level and does not include views at an individual level. The study focuses on factors influencing technology adoption decisions and how technologies are diffused; and does not examine the creation of these technologies (Lundblad, 2003).

1.6 ASSUMPTIONS MADE

The following assumptions apply to the study:

- Participants of interviews will provide honest and genuine responses.
- Participants are knowledgeable on digital transformation and strategic management.
- All spend on technology by the organisations in this study is for the purposes of acquiring digital assets as part of the execution of digital transformation strategies.
- A relationship exists between dynamic capabilities and innovation diffusion; the study is limited to the extent of the relationship and the influence of dynamic capabilities on innovation diffusion.

1.7 DEFINITION OF KEY TERMS

1. Absorptive capacity

The ability of an organisation to acquire, process and utilise and or even transform knowledge for purposes of gaining and sustaining its competitive advantage. (Zahra & George, 2002).

2. Adoption

For purposes of this study, adoption is associated with the acceptance and use of new technology by a user (Davis, 1985). For the context of this study, “new” refers to new technology to the organisation, group or group of organisations, but not novel overall.

3. Diffusion

Diffusion is the process by which an innovation is communicated and accepted for use or consumption through certain channels over time among the members of a social system (Rogers, 1995).

4. Digital transformation

Digital transformation is associated with the automation of business processes and customer journeys and building technology-enabled capabilities. Digital transformation also involves using technologies to provide alternative channels for serving customers (e.g., utilising robotics and AI).

5. Innovation

A new or significantly improved product or process that is made available to potential users or brought into use (process innovation) (OECD/Eurostat, 2005; OECD/Eurostat, 2018). Innovation can also be viewed as a process, with various actors, activities and institutions, all working together to produce a new or significantly improved product or significantly improved and/or process (Gault, 2018).

6. Technological Innovation

In the context of this study, the term technology innovation refers to information systems that are not necessarily newly developed but are considered new to the organisation seeking to adopt and diffuse these information systems.

7. Strategic Management

Strategic management comprises developing and implementing an organisation's strategy. This entails managing the strategy-making process, performing analysis and executing the chosen strategy.

8. Antecedents

In the context of this study, antecedents are described as factors that stimulate or constrain the development of dynamic capabilities (Eriksson, 2014).

9. Micro-foundations

Micro-foundations are organisational and management practices and processes that form the building blocks for developing capabilities (dynamic capabilities, for purposes of this study) (Fallon-Byrne & Harney, 2017). These include specific skills, strategies, structures and decision governance considerations (Teece, 2007).

1.8 RESEARCH QUESTIONS

The study seeks to explore the influence of dynamic capabilities on the diffusion of technological innovation when trying to achieve successful digital transformation. The following research questions are posed:

1. *How do DFIs manage their digital transformation strategies?*
   1.1 What is the role of dynamic capabilities in enabling digital transformation?
   1.2 How does the diffusion of technological innovations enable digital transformation?

2. *What is the relationship between dynamic capabilities and innovation diffusion?*
   2.1 What are the seizing dynamic capability factors that influence technology innovation diffusion?
   2.2 What are the reconfiguring dynamic capability factors that influence technology innovation diffusion?

1.9 OUTLINE AND STRUCTURE OF THE REPORT

The report is structured in chapters, and each chapter covers the following:

Chapter 1: Introduction

The purpose of the study is explained, which is an exploratory study of the influence dynamic capabilities have on the innovation diffusion process in DFIs in South Africa that are seeking to implement digital transformation strategies. The study seeks to contribute to a deeper understanding of the strategic management of digital transformation and the dynamic capabilities factors that impact it. The South African development banking landscape is explored, including the propensity of traditional DFIs to evolve digitally, enabled by technology innovations. The research question is formulated, the limitations of the study are explained, and key definitions positioned in the context of this study.

Chapter 2: Literature Review

The literature review starts with an understanding of the concept of digital transformation, a growing phenomenon in the past decade. Research involving the role of technology innovation in state-owned entities, including adoption challenges, is explored, with a focus on DFIs in South Africa. A comprehensive literature review is conducted of the dynamic capabilities, including the micro-foundations of the sensing, seizing and transforming dynamic capabilities as well as the antecedents that foster the development of dynamic capabilities. Rogers' diffusion of innovation theory is explored, with a particular focus on the stages of the innovation diffusion process in organisations. Finally, a conceptual framework is developed that describes the influence of dynamic capabilities on the innovation diffusion process to achieve successful digital transformation.

Chapter 3: Research Methodology

This chapter outlines the research strategy and design selected to conduct the study. The population and selection criteria of participants are explained. A qualitative study has been chosen for this study, where semi-structured interviews will be conducted,

and the response data analysed. Limitations and the rigour with which the study has been conducted are also stated in this chapter.

Chapter 4: Presentation of Results

The results of the study are presented in this chapter. The findings are based on the semi-structured interviews conducted with innovation managers, organisation executives, strategy managers as well as those responsible for the delivery of technology solutions within the organisations.

Chapter 5: Analysis of Results and Discussion

The findings presented in Chapter 4 are analysed and compared to the literature on the diffusion process stages and dynamic capability components, as outlined in Chapter 2. The findings were analysed against the theoretical frameworks to confirm that the relationship between dynamic capabilities and the diffusion process as explained by current literature or whether there are other unexplored factors.

Chapter 6: Conclusions and Recommendations

The key outcomes of the study are explained in this chapter, based on the findings from the semi-structured interviews and the literature review conducted. Recommendations are made, including suggestions for future research.

1.10 SUMMARY

The purpose of this study is to explore the influence of dynamic capabilities on the diffusion of technology innovation to effect digital transformation. The study specifically focuses on two DFIs in South Africa, a developing country where the industry has traditionally been dominated by a few players. As the industry evolves, the need for existing players to transform their business' in response to increased regulatory challenges, high operational costs, threats of new entrants and evolving customer profiles has become glaringly evident.

The study seeks to contribute to the limited study of the relationship between dynamic capabilities and innovation diffusion in developing economies like South Africa. The study further seeks to provide practical insights for digital transformation practitioners

to evolve their strategies and build the appropriate organisational change capabilities needed.

The study intends to include relevant literature reviews, application of theoretical frameworks and data collection from ensuing a qualitative approach to formulating a view of these factors in order to answer the research questions.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter comprises literature reviews pertaining to the aspects of this study. This includes a detailed review of digital transformation as a popular strategic objective of most organisations that find themselves having to respond to changing corporate landscapes. Following that, the study focuses on technology innovation in DFIs; the diffusion of that technology, as well as dynamic capabilities, influence the diffusion process. From the literature reviews conducted, a conceptual framework is developed, which will be validated by the research conducted in this study.

2.1.1 Digital Transformation

Many organisations have, over the last decade, sharpened their focus on digital transformation as a key strategic imperative. Necessitated by changes in industry shapes, where the role of technology has evolved to enable narrowing of product differentiation but growing the product and service offering value chains in organisations, process re-engineering and the emergence of new capabilities (Henriette, Feki, & Boughzala, 2015). Table 1 below summarises the literature review conducted related to digital transformation focusing on defining it, its relation to innovation management/strategy management and dynamic capabilities.

TABLE 1: Summary of Digital Transformation Research

Author	(Henriette, Feki, & Boughzala, 2015)	(Reis, Amorim, Melao, & Matos, 2018)	(Stief, Eidhoff, & Voeth, 2016)	(Westerman, Bonnet, & McAfee, 2014)
Theme/Category	Definition and analysis of digital transformation	Definition and analysis of digital transformation	Empirical analysis of digital transformation, how it is organised and its role as a strategic form of business development	Identification and analysis of elements of digital transformation
Title	The shape of digital transformation: A systematic literature review	Digital transformation: A literature review and guidelines for future research	Transform to Succeed: An Empirical Analysis of Digital Transformation in Firms	The nine elements of digital transformation
Key findings	Digital Transformation is described as the reshaping of existing business models, driven by:	The study comprised a literature review of peer-reviewed articles that focused on Digital Transformation. It was determined	The study examines various elements of digital transformation, offering a definition from the analysis. The	The study identifies the building blocks of Digital Transformation, which comprises transforming three key areas (customer

	• vulnerabilities of incumbents to threats of new non-traditional entrants using technology advancements; • Extensions of markets as a result of new capabilities; and • Evolving user expectations. It was further noted that Digital Transformation involves implementing digital capabilities to support business model transformations and impacted all aspects of an organisation.	that popularity in the topic of Digital Transformation was prevalent in articles focused on strategic management practices and less so in scholarly works. From the review conducted, Digital Transformation definitions comprise technological, organisational and social elements; this resulted in the authors providing a definition of Digital Transformation.	study highlights that the main drivers of digital transformation, which are competition, changing customer sentiments, the potential to optimise business processes, motivation by those charged with bringing about transformation, advances in technological innovation and the organisations' strategy. Lastly, the study identifies the challenges and opportunities of digital transformation.	experience, operational processes and business models) and the underlying three elements that are changing under each of these key areas. The three pillars comprise transforming customer experience, operational processes and business models.
Applied theories/ frameworks/ concepts	n/a – a systematic literature review of literature on digital transformation was conducted following	n/a – a systematic literature review of literature on digital transformation was conducted following	Digital Transformation	Digital Transformation
Geographical context	n/a	n/a	Germany	Global

Sectorial context	n/a	The review was limited to peer-reviewed articles from the Institute for Scientific Information - Web of Science database (ISI).	Various	Various
Methods applied	A systematic literature review method where articles published in scientific journals were selected using keyword search techniques. The search was limited to the Scopus database.	A systematic literature review method was applied, which comprised a qualitative approach based on bibliometric analysis and quantitative content analysis of the chosen literature.	In-depth field interviews were conducted with experts responsible for their respective company's digital transformation.	Interviews were conducted with executives of a variety of large organisations across the globe. The executives ranged from CEOs, line managers, operations executives and IT and technology leaders.
Author	(Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019)	(Warner & Wager, 2019)	(Mendonca & Andrade, 2018)	(Mendonca & Andrade, 2018)
Theme/Category	A flow model that describes the drivers, phases and strategic imperatives of digital transformation	A process model for building dynamic capabilities for digital transformation	Relationship between dynamic capabilities and digital transformation elements	Importance of digital transformation elements to the process of dynamic capabilities
Title	Digital transformation: A multidisciplinary reflection and research agenda	Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal	Dynamic capabilities and their relations with elements of digital transformation in Portugal	Elements of Digital Transformation in Dynamic Capabilities in a Brazilian Capital
Summarised findings	A comprehensive literature review	The study conceptualises digital transformation as "a process of building dynamic capabilities for	There is a correlation between the three technologies, namely IoT, Big Data and AI (a proxy for	In Brazil, technologies that are proxy for digital transformation for purposes of this study (IoT, Big

		strategic renewal". Therefore, a process model is proposed comprising nine micro-foundations for building dynamic capabilities for digital transformation. These are categorised as either digital sensing, digital seizing or digital transforming capabilities. The model further identifies the enablers and barriers for building these dynamic capabilities for digital transformation.	elements of digital transformation, as per the study) and three micro-foundations of Dynamic Capabilities (sensing, seizing, transforming). The biggest correlation was with sensing capability (from a Big Data and IoT perspective). Minimal correlation with transforming capability.	Data and AI) are still in the early stages of use. Based on the analysis, Big Data was found to be correlated to all three elements of Dynamic Capabilities (sensing, seizing and transforming), mostly for seizing capability. IoT and AI-related to the three elements of dynamic capabilities as well, but to a lesser extent.
Applied theories/ frameworks/ concepts	Digital Transformation	Dynamic Capabilities, Digital Transformation	Dynamic Capabilities, Digital Transformation	Dynamic Capabilities, Digital Transformation
Geographical context	n/a	n/a	Portugal	Brazil
Sectorial context	multiple	n/a	Multiple	Multiple
Methods applied	A flow model is used to describe the drivers of digital transformation, break down the phases of digital transformation based on multiple disciplinary literature analysis, and highlight	The study uses qualitative methods where through observations, meanings are extracted from processes. Findings were determined from analysing case study data where senior executives	A quantitative study comprising a survey across multiple organisations was conducted. Responses were analysed using tools to identify the correlations in responses.	A quantitative study comprising a survey across multiple organisations was conducted. Responses were analysed using tools to identify the correlations in responses.

	the strategic imperatives that result from digital transformation.	were interview subjects and conducting interviews with senior executives and strategy consultants.		

Table 1: Summary of Digital Transformation Research

2.1.1.1. Defining Digital Transformation

Based on the literature review, digital transformation has gained momentum in the last decade, resulting from the acceleration of advancements in technological innovations, changing competitive landscapes as industries evolve, and the evolution of user and customer expectations and capabilities (Henriette, Feki, & Boughzala, 2015; Reis, Amorim, Melao, & Matos, 2018; Stief, Eidhoff, & Voeth, 2016; Westerman, Bonnet, & McAfee, 2014). Digital transformation has become an imperative for any incumbent organisation looking to remain sustainable as technology enables participation of new entrants, changes in customer behaviour and diversification of products and services (Stief, Eidhoff, & Voeth, 2016). Digital transformation entails the adoption and use of technology to build new capabilities (including networking capabilities, analytical capabilities and digital agility) (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019). Further building blocks for digital transformation involve process optimisation through digitalising operational processes, enabling globalisation of the workforce and building strong performance management capability through access to insights and analytics (Westerman, Bonnet, & McAfee, 2014).

Outcomes of digital transformation include digital capabilities (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019), new business models underpinned by flexible organisational structures with multifunctional teams (Warner & Wager, 2019) and potentially new customer segments through building digitally focused growth strategies (Stief, Eidhoff, & Voeth, 2016).

Based on the literature reviews conducted, digital transformation can be defined as the strategic management of change in an organisation, involving technology-enabled process optimisation, structural reform and digital capability development.

2.1.1.2. Digital Transformation and Innovation management

Digital transformation is associated with strategic responses of an organisation towards internal and external drivers (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019); and impacts the organisations' capabilities, processes and value creation activities (Westerman, Bonnet, & McAfee, 2014). Based on the research conducted, digital transformation is associated with building new capabilities, digital capabilities and can lead to the creation of new organisational structures and new customer segments (Westerman, Bonnet, & McAfee, 2014). There are various definitions of Innovation; the most relevant to this study is the definition by (Gault, 2018), which describes innovation as the "the implementation of a new or significantly changed product or process" […] where it is considered "implemented when it is made available to potential users". Innovation management describes the strategic considerations by management in an organisation associated with managing the implementation of changes in capabilities and or value chains in the organisation (Goffin & Mitchell, 2017). Based on these commonalities, digital transformation is associated with innovation management

2.1.1.3. Digital Transformation and Dynamic Capabilities & Innovation Diffusion

Digital transformation has three elements: digitisation, digitalisation and digital transformation (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019). Digital transformation is associated with organisation-wide change that leads to new business models and value creation. In order to get there, processes need to be digitalised, and new capabilities need to be built. Dynamic capabilities are described as strategic management capabilities which enable an organisation to change or transform in response to internal and external factors (Johnson, Regner, Scholes, Angwin, & Whittington, 2017). They enable an organisation to sense opportunities, seize those identified opportunities and transform its business model in response (Ambrosini & Bowman, 2009). Dynamic capabilities are those capabilities that are imperative to driving the digital transformation of an organisation (Warner & Wager, 2019).

Mendonca & Andrade (2018) present empirical studies that highlight the correlation between dynamic capabilities and digital transformation. Although the studies present a relationship between digital transformation and the three elements of dynamic capabilities (sensing, seizing and transforming), the studies are limited to specific elements of digital transformation (IoT, Big data and AI) (Mendonca & Andrade, 2018).

Digital transformation and dynamic capabilities:

In their study, Wäger and Warner (2019) propose a model for developing dynamic capabilities for digital transformation.

The qualitative study explores the external triggers for digital transformation, proposes the micro-foundations for building dynamic capabilities which enable the digital transformation and identifies the enablers and barriers to developing these dynamic capabilities; based on case studies of incumbent organisations undergoing digital transformation (Warner & Wager, 2019).

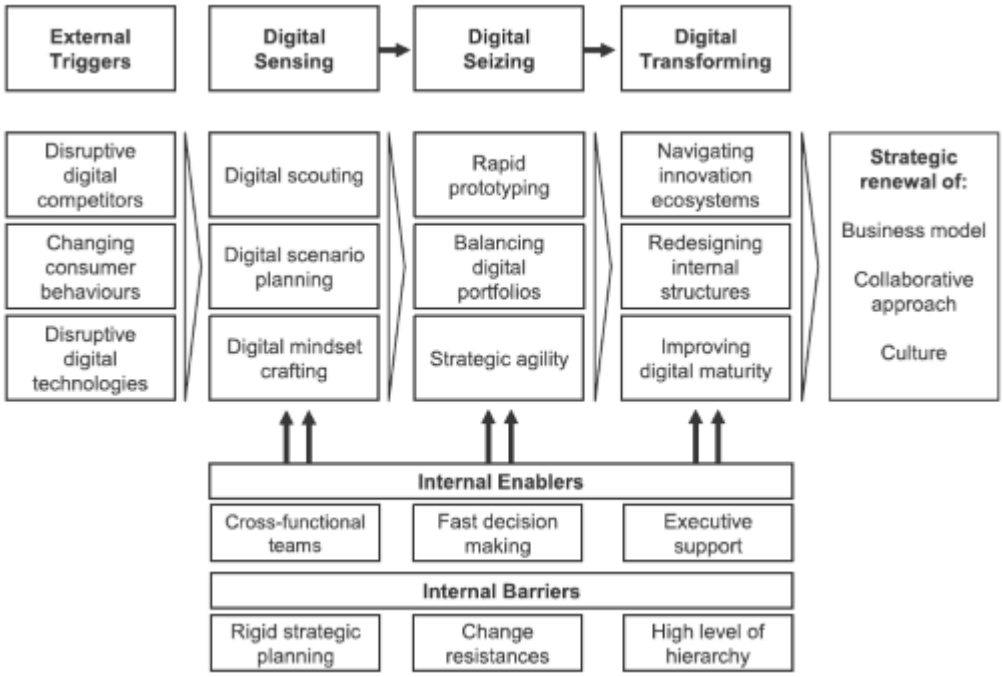

Figure 1: A process model for Building dynamic capabilities for digital transformation; extracted from *Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal, Wager and Warner, 2019*

With regards to building digital seizing capabilities, the study emphasised incorporating *strategic agility* into the business model thinking, which allowed for flexible and agile ways of work (Warner & Wager, 2019). The strategic agility will be

strengthened by *rapid prototyping* to allow for experimentation and gathering feedback for responsive action (Warner & Wager, 2019). *Balancing digital portfolios*, which comprised investing in new business models whilst keeping existing ones running, accelerated the speed of execution in achieving digital transformation (Warner & Wager, 2019).

With regards to building digital reconfiguring capabilities, the study highlighted *improving digital maturity* through the transformation of the organisation's culture and digital capability building (Warner & Wager, 2019). To build these digital capabilities, a *redesign of internal structures* is required to drive an entrepreneurial leadership team and decentralised structures through an adaptive business model to improve digital maturity (Warner & Wager, 2019). Through *navigating innovation systems*, incumbent organisations will need to build or be part of existing innovation systems to stimulate collaborations and potentially develop new business models (Warner & Wager, 2019).

Digital transformation and innovation diffusion:

In their literature review of digital transformation, Verhoef et al. (2019) discuss the flow model of the external drivers of digital transformation, the phases thereof underpinned by the strategic imperatives of digital transformation. The three phases of digital transformation have been summarised as (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019):

- *Digitisation* – The utilisation of technology tools to store, process and share information converted to digital format. Although digitisation is a technology-enabled cost-effective reconfiguration of resources, it does not change value creation activities.
- *Digitalisation* – The utilisation of technology to effect process improvements and enhance user and customer experiences.
- *Digital Transformation* – The adoption and implementation of digital technologies leading to organisational changes in value creation activities.

2.1.2 Digital Transformation in Development Finance Institutions

Traditionally, the domain of financing infrastructure development has been dominated by DFIs, most of which are wholly state-owned. DFIs are viewed as catalysts to development and the vehicles to addressing the triple threat (unemployment, inequality and poverty), especially in developing economies (Gantsho, Groenewald, & van Vuuren, 2009). In recent times, the evolution of industries and the rise of the Fourth Industrial Revolution has introduced technological innovations that have allowed organisations to transform the markets they operate in (Henriette, Feki, & Boughzala, 2015). The realm of infrastructure funding has also seen a broadening of industry participants as technology has allowed the introduction of non-traditional competitors to the landscape. In response, DFIs are looking to evolve their product offerings, operational practices and management perspectives using technology, business model and product innovations.

Several studies have focused on innovation in Public Service Organisations (PSO), with a limited focus on emerging economies (Agolla & Burger Van Lill, 2016). These studies focus on the adoption of technology innovation (e.g., eGovernment) to enable the delivery of public services and eradicating the triple threat (unemployment, poverty and inequality) (Gow, 2014).

DFIs are often state-owned, and as a result, are considered to form part of the public sector. Research regarding innovation in the public sector has unveiled a phenomenon called public sector innovation. Public sector innovation refers to a PSO's innovation activities associated with the public administration, government entities of all levels (municipal, local and national) and is mostly invoked to seek mechanisms to provide more efficient services to the public and broaden the scope of public services, given the prevailing challenges of political influences, regulatory hurdles and limited resources (Gow, 2014; Chen, Walker, & Sawhney, 2020).

Observations of a study that reviewed existing research on public sector innovation revealed the association with reform themes of public services such as electronic government and New Public Management (Bekkers, De Vries, & Tummers, 2016). The study revealed the following themes: (Bekkers, De Vries, & Tummers, 2016)

- There were various innovation dimensions studied in the public sector, but they largely focused on innovations pertaining to administration processes and enhancing these for efficiency purposes;
- Innovation processes and innovativeness of PSO's was largely influenced by the political environment, relationships between the PSO and other organisations, as well as regulatory aspects;
- At an organisational level, antecedents of innovation were mostly influenced by the availability of resources (ICT, funds, capability), leadership styles and risk appetite towards experimentation and learning; and
- There was limited focus on innovation outcomes when it came to innovation studies

When it comes to DFIs, studies of technology and innovation are largely focused on DFIs seeking investments in technology that will address sovereign economic challenges in a far greater magnitude (George & Prabhu, 2003). These studies have sought to prove how DFIs should focus on seeking opportunities where technology has been incorporated into infrastructure development, either through financing activities or investing in technological infrastructure (George & Prabhu, 2003). Other studies focus on how DFIs can leverage innovative financial solutions as a way to stimulate the overall innovativeness of an economy (George & Prabhu, 2003; Bandura, Ramanujam, & Runde, 2019).

A study was conducted to determine how to foster innovation and corporate entrepreneurship within a DFI in order for the DFI to respond to the changing competitive landscape and remain sustainable (Gantsho, Groenewald, & van Vuuren, 2009). The study recognises that many organisations are looking to re-invigorate their entrepreneurial orientation, as entrepreneurship is taken as a proxy for the ability to change with the increasingly competitive environment. The study proposes that corporate entrepreneurial training of employees in a DFI will increase the innovativeness of the organisation (Gantsho, Groenewald, & van Vuuren, 2009).

The existence of limited literature that could be found on the role of technology in DFIs has presented opportunities for studies that focus on digital transformation in DFI

organisations and capabilities that enable effective diffusion of adopted technological innovations.

2.1.3 Diffusion of digital technologies in DFIs

The critical role of technology adoption to enable more effective, efficient and speedily public service delivery is recognised in public service innovation literature (Gow, 2014; Bekkers, De Vries, & Tummers, 2016).

At a national level in developing economies, the adoption of technologies is influenced by political challenges and difficult business conditions, scarce education resources and poor infrastructure (Nganga & Mwachofi, 2013). Researching studies conducted on technology innovation adoption in DFIs was challenging as few studies could be found. Seeing as a DFI is state-owned, the search was broadened to studies on technology adoption in public service organisations (PSOs).

Factors that influence the rate of innovation diffusion in state-owned organisations differ from those in a private sector setting. These factors can be categorised as those internal (institutional) to the organisation and those that are external. State-owned entities are more at an advantage to be exposed to new technologies; however, they tend to be slower in their efforts to adopt those technologies due to institutional factors such as management structures which may slow the diffusion rate of technology (Fisher-Vanden, 2003). Despite their advantage of having better access to these technologies, the incentive for PSOs to adopt and diffuse these technologies is minimal (Fisher-Vanden, 2003).

Innovation adoption studies that seek to understand the influences of the diffusion process have a limited focus on state-owned organisations and are limited to developed countries such as the United States of America. One such study conducted by Damanpour and Schneider (2009) argues that in addition to factors that are internal and external to the organisation, characteristics (cost, complexity and impact) of the innovation itself influence the adoption of the innovation (Damanpour & Schneider, 2009), but not in the manner expected. In particular, the cost of the innovation

generally negatively influences the adoption of the innovation; however, in public organisations, the cost is less important as compared to the expected benefits of the technology under consideration (Damanpour & Schneider, 2009). In a country like South Africa, however, due to regulatory limitations on spending activities of state-owned entities, the findings could be different. The study also found that the complexity of the innovation did not negatively impact the innovation's adoption; this was attributed to innovation in public organisations being incremental in nature and, therefore, less complex (Damanpour & Schneider, 2009). The impact of the innovation promotes the adoption process, in the case where the innovation is administrative in nature and aligns to governmental reforms such as eGovernment and NPM (Bekkers, De Vries, & Tummers, 2016).

Other factors that influence the adoption of innovations in state-owned entities or PSOs include lack of incentives, funding challenges, changes and tenure of political/administration leadership and the public support of these innovations (Niehaves, 2007).

It's more difficult to achieve adoption of innovations (especially technological innovations) within public organisations because of the absence of incentives to embark on transformational change (Piening, 2013); therefore, these transformational initiatives fail at the implementation phase or yield low results. Little research has been done on the innovation process in organisations such as DFIs and how those attributes of the process impact innovation diffusion.

2.2 SUMMARY

Digital transformation in organisations is no longer viewed as an option but rather an imperative strategic lever (Stief, Eidhoff, & Voeth, 2016) accelerated by technological advances, increased competitiveness and the evolution of customer sentiments (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019). Digital transformation is defined as the strategic management of change in an organisation, involving technology-enabled process optimisation, structural reform and digital capability development (Henriette, Feki, & Boughzala, 2015; Reis, Amorim, Melao, & Matos,

2018; Stief, Eidhoff, & Voeth, 2016; Westerman, Bonnet, & McAfee, 2014).. A relationship exists between digital transformation and dynamic capabilities, which are the organisational capabilities that drive strategic change. Studies focused on digital transformation and building dynamic capabilities needed to manage the transformation in DFIs could not be found. Based on the literature review on innovation management in state-owned organisations, most of the research focused on public service innovation, which comprised the adoption of technological innovations associated with public service reforms such as eGovernment and NPM (Agolla & Burger Van Lill, 2016).

As the South African development finance landscape changes shape as a result of digitally enabled new entrants, it is important to understand the influencing factors of diffusion and the dynamic capabilities that enable this diffusion as incumbents explore digital transformation to maintain the sustainability of their organisations.

2.3 THEORETICAL AND CONCEPTUAL FRAMEWORK

2.3.1 Theoretical Frameworks

Strategic imperatives for successful digital transformation in an organisation mainly involve the development of digital capabilities, structural reforms and adoption of certain growth strategies (Verhoef et al., 2019). Dynamic capabilities are those organisational capabilities that enable strategic change and are critical to driving these strategic imperatives (Mendonca & Andrade, 2018), particularly the effective diffusion of digital technologies.

Adoption and diffusion of innovation are equally as critical as the invention/creation of the innovation, for, without this, the innovation becomes redundant (Bara, 2016). Having capabilities that enable the identification and effective diffusion of the innovation for strategic outcomes is equally important for the long-term sustainability of an organisation in a VUCA environment. The basis of this study will be grounded in Dynamic Capabilities and Rogers' Diffusion of Innovation theories.

2.3.1.1 Dynamic Capabilities

Defining dynamic capabilities

Dynamic capabilities theory describes the capabilities of an organisation to identify opportunities and reorganise its finite internal capabilities (or take advantage of external capabilities) in response to a rapidly changing competitive environment (Pisano, Shuen, & Teece, 1997). At a high level, studies propose that dynamic capabilities represent a strategic approach to gaining competitive advantage through reconfiguration of organisational practices to take advantage of new opportunities (Pisano, Shuen, & Teece, 1997). The theory also focuses on the abilities of organisations to effectively utilise, develop and evolve capabilities through managerial practices to influence changes in organisational processes (Eisenhardt & Martin, 2000; Zollo & Winter, 2002).

Other researchers have defined dynamic capabilities as strategic processes (Giniuniene & Jurksiene, 2015) or capabilities associated with strategic change (Johnson, Regner, Scholes, Angwin, & Whittington, 2017). They've often been distinguished from organisational capabilities, where dynamic capabilities are described as the organisation's ability to innovate and change outside of its current routines (Kelley & Lee, 2008). Dynamic capabilities are directly linked to organisational strategy identification (determining strategic objectives), prioritising (selection of choices) and strategy implementation (Johnson, Regner, Scholes, Angwin, & Whittington, 2017).

The theory stems from the Resource-Based approach, an approach that considers an organisation's competitive advantage as stemming from unique (difficult to replicate) resources that are effectively managed to produce higher quality products at lower costs (Penrose, 1995). The dynamic capabilities approach expanded to include a focus on the adaptation of these difficult to replicate resources to innovative organisational processes (Piening, 2013; Helfat, et al., 2007).

From the research, it can be deduced that the varied definitions of dynamic capabilities can and has, to some extent, left room for varied interpretation and application of the theory. However, recurring themes of the theory include:

- Strategic change processes of organisational resources or creation of new ones, often in response to changes in externalities; (Eisenhardt & Martin, 2000; Eriksson, 2014; Ambrosini & Bowman, 2009; Johnson, Regner, Scholes, Angwin, & Whittington, 2017)
- Continuous adaptability in response to changing competitive environment or gaining competitive advantage (strategic management); (Winter, Understanding Dynamic Capabilities, 2003; Pisano, Shuen, & Teece, 1997; Teece, 2007)
- Routinising of managerial practices and entrepreneurship orientation to identify needs for change and execution of that change (Zollo & Winter, 2002)

For purposes of this study, the definition presented by Johnson et al. (2017) is adopted, which describes dynamic capabilities as those capabilities associated with understanding an organisation's strategic position, making strategic choices and implementing those strategies.

Characteristics of dynamic capabilities

There are three characteristics of dynamic capabilities which are widely understood by the theory's scholars, underpinned by certain contributory factors, also known as micro-foundations:

Sensing dynamic capabilities:

Sensing comprises the activities that an organisation engages in to identify new opportunities (Teece, 2007). These opportunities stem from using existing information to identify gaps or creating opportunities based on new information obtained (externally or internally) (Teece, 2007). This capability is built on the existence of entrepreneurial skills of individuals and organisational processes, such as research capacity, market scanning and competitor/customer landscape analyses, which enable the discovery of opportunities (Eriksson, 2014).

Sensing micro-foundations:

The entrepreneurial orientation of management is a significant contributory factor to developing dynamic capabilities; sensing dynamic capabilities are developed from the cognitive ability to be able to use existing information or source new information for diagnostics or to identify opportunities (Teece, 2007; Ambrosini & Bowman, 2009). At an organisational level, dynamic capabilities are developed through processes that facilitate the transfer of information between top management and staff, facilitated by middle management, as well as collaboration from stakeholders (customers, suppliers, etc.)

Seizing dynamic capabilities:

Seizing capabilities describe those attributes of an organisation that enable it to select the most suitable opportunity and align it with strategic objectives and available resources and any changes to these (Teece, 2007). Simply put, it refers to the way in which an organisation can take advantage of the emerging opportunity; by ensuring the investment into the opportunity is timed right, the optimal technology is chosen (where applicable), which complements available capacity and networks (Teece, 2007). Critical to the success of this capability is the decision-making protocol (structure, procedures, organisational design) in an organisation to ensure alignment of actions (business model reviews, technology investments, capability building) stemming from those decisions whilst minimising imminent risks.

Seizing micro-foundations:

Factors impacting seizing DCs involve the selection of product offering and business model construct considerations (Teece, 2007). These are underpinned by deliberate and careful considerations of technologies to embed in product and service offerings, target markets based on insights obtained and business models that enable effective technological innovation adoption (Teece, 2007).

Transforming dynamic capabilities:

As organisations grow and become profitable from investments made in new opportunities, technologies and evolved business models, their long-term sustainability is threatened by path-dependent growth. An organisation's ability to reorganise its resources and redesign its organisational structures in response to changing market dynamics and technology advancements prolongs its sustainability

(Teece, 2007). Most organisations respond to incremental innovations better because changes to structures and practices are adapted gradually, which minimises the uncertainty that comes with the introduction of radical innovations (Teece, 2007).

Transforming micro-foundations:

Decentralisation of operating segments to allow for decentralised decision-making can accelerate the exploitation of identified opportunities. Furthermore, foundational to building dynamic capabilities include having strong governance practices that allow for technology transfer whilst still protecting IP rights that allow for the creation of learning, knowledge-sharing and integration (Teece, 2007).

A review of scholarly work done on dynamic capabilities, where comprehensive reviews were conducted of previous articles on the theory, classified attributes as antecedents of dynamic capabilities as either internal or external to the organisation (Eriksson, 2014). Antecedents are the promoters or inhibitors of building dynamic capabilities (Ambrosini & Bowman, 2009).

Antecedents of dynamic capabilities:

Antecedents of dynamic capabilities are those processes that create dynamic capabilities, those enablers or inhibitors to the development of dynamic capabilities.

Internal antecedents are comprised of social and structural capabilities (Eriksson, 2014) (Ambrosini & Bowman, 2009). Social capabilities include an organisation's orientation towards building dynamic capabilities, the level of flexibility, collaboration and project-related capabilities in the organisation and organisational routines that stimulate the development of dynamic capabilities (Eriksson, 2014). Structural capabilities involve the structure of the organisation itself and its ability to enable dynamic capabilities' development (Eriksson, 2014). Furthermore, the availability of resources and the alignment of these to opportunity-seeking or risk identification and the ability to transform the organisation in response is vital to enable dynamic capabilities. The ability (skills, experience and willingness) of management to embrace change and bring about continuous improvements in operational routines enables dynamic capabilities to develop (Eriksson, 2014; Helfat, et al., 2007). Adversely, path

dependency created by management in executing past strategies may constrain the development of dynamic capabilities (Ambrosini & Bowman, 2009). In their analysis of dynamic capabilities, Ambrosini and Bowman (2009) highlight other antecedents which impact the development of dynamic capabilities:

- Individuals' social ties within the organisation and outside the organisation may develop dynamic capabilities through knowledge sharing, collaborations and stimulating new ways of thinking (Ambrosini & Bowman, 2009).
- Transformational leadership attributes stimulate the development of dynamic capabilities (Ambrosini & Bowman, 2009). This fosters a culture of learning and experimenting which will inform business model changes to be made.
- Trust created by leaders enables dynamic capabilities to develop (Ambrosini & Bowman, 2009).

External antecedents are environmental factors and relationships between organisations (Teece, 2007). An organisation may choose to develop its dynamic capabilities through partnerships (where capabilities are lacking in-house), leveraging of network relationships and finding complementary assets through networks (Teece, 2007). Environmental factors such as market conditions, uncertainties and complexities in those markets and changes in regulation may necessitate the development of dynamic capabilities in an organisation (Teece, 2007; Helfat, et al., 2007).

Based on the analysis performed, it can be determined that dynamic capabilities are those processes/routines of an organisation, at a strategic level, that stimulate and manage the strategic change of an organisation in response to a changing environment. Strategic change in incumbent organisations entails evolving processes, capabilities and use of technology to evolve business models – which can be achieved through digital transformation.

Theoretical Application – dynamic capabilities

Studies have linked dynamic capabilities to organisational performance or competitive advantage, even though these links are somehow superficial (Eriksson, 2014) and

focus more on the intended outcomes of developing these capabilities in an organisation (Pisano, Shuen, & Teece, 1997). Some studies have associated dynamic capabilities as part of strategic management practices/approaches (Kelley & Lee, 2008). Arifin and Frmanzah (2015) developed a conceptual framework to examine the relationship between technology adoption determinants and absorptive capability (as a proxy for dynamic capability). The framework combined the dynamic capabilities theory with the technology, organisational and environmental theory and proposes that technology adoption is a mediating factor in the relationship between dynamic capabilities and organisational performance (Arifin & Frmanzah, 2015).

In their literature review, Ambrosini and Bowman (2009) assess various empirical studies conducted regarding identifying specific dynamic capabilities, ranging from R&D, acquisitions, product innovation, absorptive capacity, organisational restructures and resource divestment.

Studies have been conducted that have identified the relationship between dynamic capabilities and elements of digital transformation (Mendonca & Andrade, 2018). The studies conducted in Portugal and Brazil identified a relationship between elements of digital transformation and the sensing, seizing and transforming characteristics of dynamic capabilities (Mendonca & Andrade, 2018).

Studies focused on identifying the dynamic capabilities required to enable effective technology adoption to drive successful digital transformation are limited (Arifin & Frmanzah, 2015). Especially studies focused on public organisations like development finance institutions.

2.3.1.2 Diffusion of Innovation

Organisations often adopt technological innovations to gain a competitive advantage over their competitors (Wu, Zsidisin, & Ross, 2007). The process of selecting these technologies and implementing them within the organisation is referred to as the diffusion process.

Diffusion of Innovation theory is rooted in economics, sociology and communications theories (Damsgaard & Lyytinen, 2001). Everett Rogers was one of the pioneer theorists of innovation diffusion theory. He was a renowned scholar who continuously evolved the diffusion of innovation theory from 1962, including incorporating other scholars' research. The fifth edition of his publication includes 1000 citations of published work by other scholars (Lundblad, 2003).

Rogers' early work on the theory mainly focused on the diffusion of innovation between individuals. In his later work (1995), he included research on the diffusion of innovation within and between organisations (Rogers, 2003).

The main theoretical elements explain the factors that influence the diffusion of innovation, which are (Rogers, 1995):

- *The innovation:* Certain characteristics of the innovation itself help explain the rate of adoption of that particular innovation. These characteristics are categorised as *relative advantage, compatibility, complexity, trialability and observability*.

- *Communication:* How information related to the innovation is shared influences the rate of adoption; the more relatable the communicator is to the potential adopter, the higher the expected rate of adoption.

- *Time:* The rate of adoption is a factor of the timing of the process, from when the potential adopter is introduced to the innovation to when they make a decision to adopt or reject it.

Figure 2.1 illustrates the categories of adopters who are driven by different influences and chose to adopt at various times.

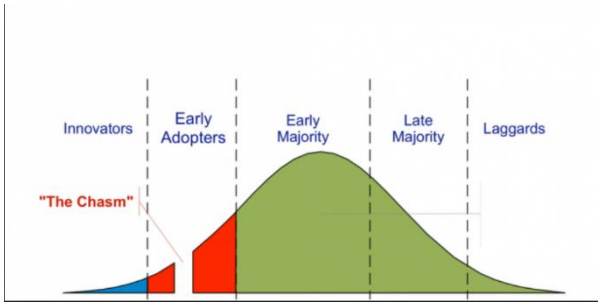

Figure 2.1 Adopter Categories for Innovations. Adapted from "The Revised Technology Adoption Life Cycle" (p. 21) from Crossing the Chasm, Third Edition by Geoffrey A. Moore. Copyright © 1991, 1999, 2002, 2014

Social system: A social system comprises individuals, groups and/or organisations linked by common objectives; it is within this social system that diffusion occurs.

Diffusion of Innovation in organisations

In his later work, Rogers (2003) includes the following additional influences of the innovativeness of an organisation and thus its rate of diffusion (Rogers, 2003):

- *Structural characteristics of an organisation*

  This includes *centralisation* (control and power), *complexity* (concentration of specialised capability), *formality* (rigidity of business rules), *availability of resources* and *size* considerations of the organisation. Studies showed a low correlation of these structural variables to organisational innovativeness; however, low centralisation, high complexity and low formalisation have proven to facilitate the initiation of the innovation process (refer below).

  In addition, studies have also shown that an organisation's absorptive capacity (ability to learn) influences the extent of innovation adoption and implementation (Wu, Zsidisin, & Ross, 2007).

- *Leadership attributes*

  Leadership attitudes towards change and openness of the organisation to external parties and their influence on the innovativeness of the organisation. Top

management commitment towards driving the diffusion process is critical to the success of the diffusion process. (Wu, Zsidisin, & Ross, 2007)

- *Types of innovation-decision influence the innovation-decision process*
  Whether decisions are authoritatively instructed from a select few to the rest of the organisation or whether decisions are made collectively throughout the organisation influence its innovativeness.

Other studies have also highlighted external environmental factors such as increased competitive pressures as competitors adopt innovations or conform to emerging industry norms (Wu, Zsidisin, & Ross, 2007).

The innovation diffusion process in organisations

Due to limitations of studies on the correlation of factors influencing the innovativeness of organisations, Rogers emphasised the focus on the innovation development process and understanding the components of it in explaining the diffusion of innovations in an organisation (Rogers, 2003). At a high level, the process consists of the *initiation* phase and the *implementation* phase, in which five stages fit in. The initiation phase is described as the phase for information gathering and planning activities that enable the decision to adopt the innovation (Rogers, 2003). The implementation phase comprises the activities and decisions involved in ensuring the innovation is used (Rogers, 2003).

Initiation phase

1. *Agenda-Setting*
   This stage refers to how organisations identify (including prioritising) gaps and seek innovations to address those gaps, i.e., the stage involving R&D activities. These gaps could be triggered by mismatches in expected organisational performance and actual performance or opportunistic surveillance of known innovations in the market to potentially solve an organisation's challenge.
2. *Matching/applying research*
   Matching involves the determination of whether the identified innovation actually resolves the business challenges identified. It includes considerations of expected benefits and risks associated with implementing the innovation. At

this stage, a determination is made by decision-makers to adopt the innovation or end the innovation process.

Implementation phase

3. *Redefining/Restructuring*

   This phase begins with activities such as designing, prototyping and testing of the innovation and related processes. At this phase, the adopted innovation is adapted to the organisational needs; at the same time, the organisation changes to accommodate the innovation through evolving strategies, including deploying new business models (Gomes & Osman, 2019). This is prevalent in instances of implementing a technological innovation, which warrants the adaptation of the innovation and the organisation. Where innovation is radical in nature, the high uncertainty breeds resistance, making it more difficult to implement it within the organisation.

4. *Clarifying*

   This stage involves the commercialisation of the innovation to the wider organisation to create a common understanding of the presence of the innovation, its impact on the workforce and embedment of the innovation in the organisation. Activities at this stage include marketing, packaging and distribution of the innovation, its use and benefits.

5. *Routinising*

   At this stage, the innovation should be fully embedded into the organisation processes and structure, and its usage should be sustained (if it addresses the business challenge it was intended to address).

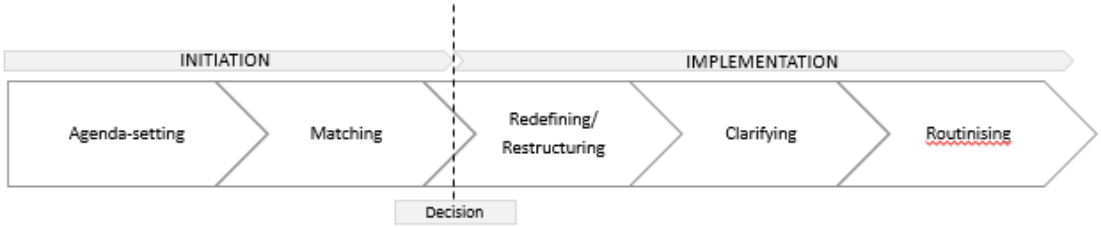

Figure 2.2 Five Stages in the Innovation Process in Organisations. Adapted from "Diffusion of Innovation" (p. 300), Fifth Edition by Everett Rogers. Copyright © 2003

Although Rogers' DOI theory has been extensively applied and is held in high regards by other scholars, it has been critiqued by scholars of Information Systems studies, which presents a number of gaps for further research or augmentation with other theories. Prescott and Conger (1995) applied to it over 70 IT articles referencing the theory, questioning the credibility of the theory in the field of technological innovations. These include critiques that the theory limits its applicability to factors influencing diffusions of complex and networked technologies (Damsgaard & Lyytinen, 2001); thus, it could not explain certain technology adoptions.

A few weaknesses have been identified concerning the diffusion of innovation with an organisation explained by Rogers. For instance, the communication channel articulated is limited to the use of change agents and champions and is silent on channels such as professional associations, journals, etc. (Lundblad, 2003).
Themes emerging from the critique of Rogers' DOI theory (Lundblad, 2003):

- The focus of Rogers' diffusion of innovation theory is primarily on individuals and is minimal on diffusion within organisations;
- The theory lacks depth in terms of understanding the interaction between the innovation, adopter, social system and other influencers of adoption in an organisational setting;
- Rogers' theory is light on diffusion *across* organisations, leaving a gap around diffusion in certain industries where inter-organisational diffusion is prevalent.

Theoretical Application – innovation diffusion

Other researchers have applied Rogers' DOI at an organisational level for studies that included an analysis of the relationship between organisational size and innovation (Damanpour F. , 1992); the importance of communication channels to the diffusion of the innovation process (Lindquist & Mauriel, 1989); as well as the influence of the innovation-decision styles on the adoption of innovation (Marcus & Weber, 1989; Van de Ven & H.L & Poole, 1989).

The theories around factors affecting the adoption of technologies by organisations have received some criticisms, the most frequent one being the fact that these factors

were too simplistic to be used as predictors of impediments of technology adoption, especially in developing economies (Abdul-Gader, 1997; Centteno , 2004; Danowitz, Nassef, & Goodman, 1995; Kamel & Hassan, 2003).

Rogers' theory is highly regarded by many scholars due to the rigour with which he developed the theory throughout the years, through a continuous meta-analysis of diffusion studies as he evolved the theory over the years (Gow, 2014). Despite the critiques of Rogers' DOI theory, the theory remains relevant and widely used in empirical studies, including studies that consider the factors that influence the adoption of various technological advancements (Gomes & Osman, 2019). Based on these studies, the innovation development process is an ongoing process and is not as linear as described by Rogers (2003), as insights are gained after diffusion of the innovation on improvements that can be made (Gomes & Osman, 2019).

2.3.2 Conceptual Framework

Digital transformation has become a strategic imperative for incumbent organisations wanting to remain competitively relevant and sustainable in response to digitally enabled new entrants to industries, changing customer sentiments and broadening of industries and value chains (Goffin & Mitchell, 2017). Digital transformation elements involve the enhancement of customer experience through the use of technology to better understand customers and market segments (Westerman, Bonnet, & McAfee, 2014). It also involves process optimisation activities such as process automation, globalisation of the workforce enabled by virtual tools and better performance management (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019; Westerman, Bonnet, & McAfee, 2014). Digital transformation also involves the transformation of business models; through modifying existing business digitally or creating value through new digital business opportunities and enabling globalisation of the digitised business (Westerman, Bonnet, & McAfee, 2014).

It is evident that significant investment in technology innovation as a strategic enabler of the digital journey is required for digital transformation. Therefore, it has become important for incumbents to ensure they make the right decisions in terms of which

technologies to adopt and, subsequent to that decision being made, ensuring that they create an optimised environment for successful diffusion of these technologies into the organisation. Furthermore, as conditions continue to change, the capabilities exist to respond adequately to ensure long term sustainability.

Dynamic capabilities entail the ability of organisations to effectively utilise, develop and evolve capabilities/resources through managerial practices to influence strategic changes in organisational processes (Eisenhardt & Martin, 2000). These are the capabilities needed to manage the process of digital transformation, including the diffusion of technology innovations (Mendonca & Andrade, 2018).

This study seeks to understand the specific influences of dynamic capabilities in a DFI on the innovation adoption process of technology innovations using the theoretical frameworks described as well as literature reviews as a basis of the study. The dynamic capabilities lens will only focus on seizing and transforming dynamic capabilities. An organisation that chooses to elect digital transformation has already conducted research and analysis in their decision to embark on a digital transformation journey. The interest of this study is focused on how this transformation is brought into effect and the capabilities that drive the strategic changes required, especially for the diffusion of technology.

The table below summarises literature review findings with regards to the micro-foundations for developing digital seizing and digital reconfiguring capabilities for digital transformation as proposed by Wäger and Warner (2019), as well as the antecedents whose presence or lack thereof enable or inhibit the progress of digital transformation. The data collected in this study will be analysed in conjunction with these attributes for validation or identify other emerging themes:

Dynamic capabilities antecedents			**Dynamic Capabilities for Digital Transformation** (Warner & Wager, 2019)	
Antecedents	**Description**		**Micro-foundations**	**Description**
Organisational change	• Capability to create, evolve and/or replace the business model(s)	**Seizing dynamic capabilities**	Rapid prototyping	An experimental capability that supports action through mechanisms like prototyping and collection of feedback speedily; and responding to the feedback obtained.
Decision-making	• Decision-making approach • Frequency and composition of decision-maker • Avoidance of biases and errors		Balancing digital portfolios	The ability to complement existing capabilities while building the digital infrastructure that will enable rapid prototyping and strategic agility.
Leadership capability	• Skills set • Management consensus • Influence/motivation of rest of workforce		Strategic agility	Capability to take advantage of emerging opportunities and responding to avoid emerging threats, whether they are technological or market expansion in nature.

Organisational structure	• Governance • Level of decentralisation	**Transforming dynamic capabilities**	Redesigning internal structures	Decentralisation stimulates more agile and independent decision-making.
Organisational adaptability/Strategic fit	• Resource mix • The fit between strategy, culture and processes		Navigating innovation systems	A capability that enables the building or joining of digital ecosystems through interactions or collaborations with identified partners or networks.
Absorptive capacity	• Integrating R&D from external sources and internal • Creation of knowledge sharing, integrating and learning		Improving digital maturity	The creation of a culture of promoting a digital mindset and transformational leadership. The balancing of recruitment of “digital-natives and workforce transition of incumbent employees.
Culture	• Promotion of ideation • Alignment of incentives • Capability building • Entrepreneurship and intrapreneurship orientation			

Table 2: Dynamic Capability antecedents and micro-foundations for Digital Transformation

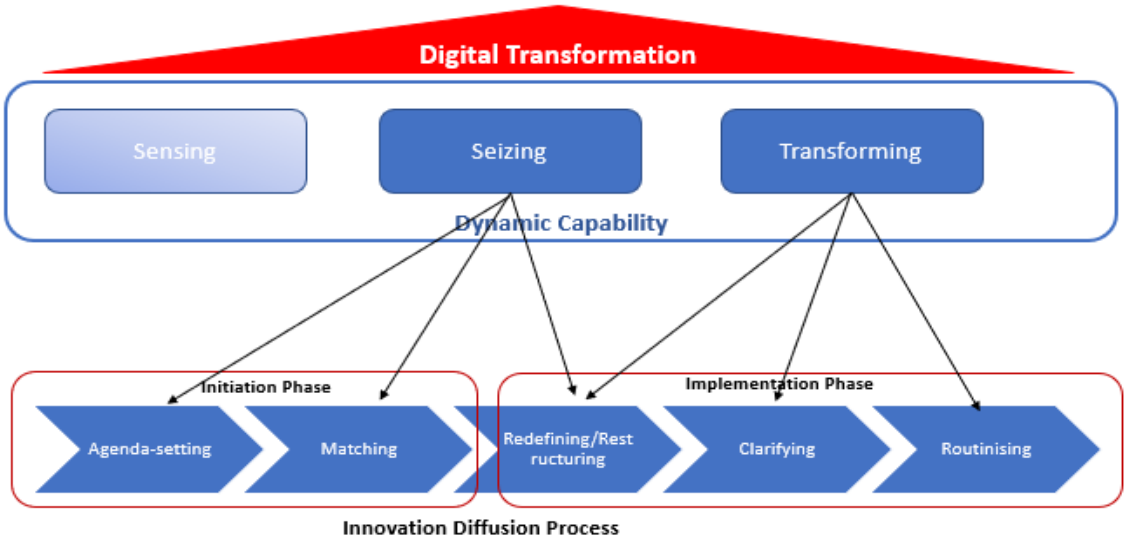

Figure 2.3 Conceptual Framework, which looks at the influence of dynamic capabilities on the innovation diffusion process in an organisation.

2.4 STATEMENT OF PROPOSITIONS

Digital Transformation is the strategic change process and outcome in an organisation, involving technology-enabled process optimisation, structural reform and digital capability development. This study aims to explore the relationship between dynamic capabilities and the diffusion of digital technologies in order to enable successful digital transformation in a DFI.

Based on the literature review conducted and the proposed conceptual framework, the following research propositions seek to answer the research questions and will be validated in this study:

- **P1:** The role of dynamic capabilities in enabling digital transformation involves the strategic management of organisational change, including managing technology-enabled process optimisation, structural reform and digital capability development.
- **P2:** The diffusion of technological innovation enables digital transformation through the adoption and implementation of technology and related process and structural changes.

- **P3:** The seizing dynamic capabilities micro-foundations that influence innovation diffusion are rapid prototyping, balancing digital portfolios and strategic fit enabled by organisational change, decision-making and leadership capabilities factors.
- **P4:** The reconfiguring dynamic capabilities micro-foundations that influence innovation diffusion are navigating innovation ecosystems, redesigning internal structures and improving digital maturities enabled by organisational structure, organisational adaptability, absorptive capacity and culture.

2.5 SUMMARY

Based on the literature review conducted in this chapter, digital transformation has been summarised as the strategic management of change in an organisation, involving technology-enabled process optimisation, structural reform and digital capability development. Digital transformation in incumbent organisations has been triggered by threats to their sustainability as a result of new entrants in traditional industries, changes in customer needs and behaviours and emerging disruptive technologies. Digital transformation involves the adoption of technologies, business model transformation and new capability development. Limited research could be found on digital transformation in DFI. Research regarding state-owned entities and innovation management focused on public sector innovation, which entails the implementation of novel practices by a public sector organisation to create or enhance value through its service offerings (Chen, Walker, & Sawhney, 2020).

Dynamic capabilities are those processes/routines of an organisation, at a strategic level, that enable an organisation to respond to a rapidly changing environment. This response in incumbent organisations may include evolving processes, capabilities and use of technology to evolve business models – which can be achieved through digital transformation.

Innovation diffusion describes the process of adoption and implementation of technological innovations. This study is focused on the process of technological innovation diffusion in incumbent organisations (specifically DFIs) and the attributes that influence the success of these to achieve digital transformation.

A conceptual framework has been developed from the literature review, which describes dynamic capabilities as the management capabilities required to manage strategic change in organisations in response to rapid changes in an organisation's operating environment. This strategic change is characterised as digital transformation. Dynamic capabilities are the capabilities needed to manage the process of digital transformation, including the diffusion of technological innovations.

Based on the conceptual framework developed, propositions have been developed, which will be tested in this study. The focus of the study is to understand the specific influences of dynamic capabilities in a DFI on the innovation adoption process of technology innovations, specifically the seizing and reconfiguring of dynamic capabilities. The findings from the interviews conducted in this study will be considered against the micro-foundations of the seizing and reconfiguring dynamic capabilities determined from the literature review to validate the propositions or present emerging considerations.

CHAPTER 3: RESEARCH STRATEGY AND METHODOLOGY

This study seeks to understand the relationship between dynamic capabilities and the diffusion of technological innovations that enables successful digital transformation in a DFI. The study is framed as a social science study, where a qualitative research approach has been adopted, and data has been collected by conducting semi-structured interviews. This chapter outlines the research strategy followed for this study to answer the research questions.

3.1 INTRODUCTION

3.1.1 Interpretive study

Based on the research questions of this study, the paradigm underpinning this study is interpretivism. The study is not restrictive to phenomena that can be observed and measured (positivism) but seeks to make reasonable inferences about the influence of dynamic capabilities on technological innovation diffusion to enable digital transformation (post-positivism). These inferences were made through the researcher's interpretation of the participants' views collected from interviews conducted and reconciled with the researcher's own perspectives (Bhattacherjee, 2012) to validate the propositions put forward.

An inductive approach has been determined for this study through an analysis of micro-foundations and antecedents of dynamic capabilities and those of innovation diffusion in an environment undergoing digital transformation, and a causal relationship between both phenomena was deduced.

3.1.2 Paradigm Assumptions

Interpretivism is a paradigm that rejects objectivism, as it recognises the complexity and multifaceted views of the world; it acknowledges reality accessed *"through the social constructions such as language, consciousness and shared meanings"* (Creswell, et al., 2016). The data was interpreted using constructivism, which

recognises the subjective meanings that individuals assign from their experiences (Creswell, et al., 2016); thus, a qualitative research methodology was followed. The study seeks to understand, from the participants' views and experiences, how they understand dynamic capabilities and their relation to innovation diffusion in their respective organisations to enable digital transformation. There is a further appreciation for the social constructs that this study is set in (Creswell, et al., 2016).

In this study, there was a reliance on the views of the research participants and their interpretation and views on the study subject (Gephart, 2019). The study required the researcher to be interactive with the participants as they navigated through the complexity of the concepts of digital transformation, dynamic capabilities and innovation diffusion, the interactions of these concepts and underlying factors enabling or inhibiting these interactions. Semi-structured interviews were conducted to extract a deeper understanding from the participants (Rossman & Rallis, 2012)

3.2 RESEARCH STRATEGY AND DESIGN

The research design, informed by the objective of the study, refers to the plan or strategy of a study which describes how the philosophical assumptions will be explored or explained through a process of participation selection, data gathering using specific techniques and data analysis (Creswell, et al., 2016).

In this study, an explanatory research approach was followed based on the semi-structured interviews conducted and literature reviews on the theories of innovation diffusion and dynamic capabilities; and their application to a DFI in a developing country for purposes of bringing about digital transformation. The study seeks to understand the influence of dynamic capabilities on innovation diffusion and how the factors underpinning both these theories drive digital transformation. Therefore, a qualitative approach was selected due to the interpretive nature of the study and the collection of data using open-ended questions posed to participants to solicit their interpretations (Bhattacherjee, 2012; Tetnowski, 2015).

According to Creswell (2018), there are five approaches to conducting qualitative research studies. Considering the approaches, the narrative, case study and

ethnography approaches seemed similar when studying individuals (Creswell & Poth, 2018). For purposes of this study, considering the research questions posed and the purpose of the study, a case study approach was deemed more appropriate as it does not involve only a single individual, neither does it involve the study of culture sharing for a specific group (Creswell & Poth, 2018; Yin, 2017).

A case research design was selected, where interviews were conducted with participants from two DFIs in South Africa. Case studies are appropriate in conducting studies within a real-life context, where insights are obtained from multiple sources, and there are interacting variables to consider (Tetnowski, 2015). A case study is the most appropriate research design for this study because it was determined that there is a relationship between digital transformation and dynamic capabilities and digital transformation and innovation diffusion (Creswell & Poth, 2018). However, the study sought to understand the relationship between dynamic capabilities and innovation diffusion by exploring causal factors and commonalities in their respective micro-foundations.

Other analytical approaches were considered, but they were deemed not suitable for this study. A phenomenological approach would be more suitable if the study was focused on the lived experiences of the participants as well as the researcher (Creswell et al., 2016), whereas this study focused on their observed experiences of the organisational ecosystem in response to the introduction of technological innovations and strategic management practices that drive decision making around these technology innovations. The grounded theory analysis approach encompasses coding procedures, which is inconsistent with the objective of the study (Creswell et al., 2016). The study is more explorative, with an element of comparison against literature and existing theories. Lastly, a narrative study was also considered not suitable, as the study considered cases and not individuals to explain the phenomenon within DFIs due to their unique features of being state-owned yet expected to compete with private institutions and other governmental organisations.

The time horizon chosen for this study was cross-sectional, where the research was conducted at a point in time and not over prolonged periods of time, as in the case of longitudinal studies. This was informed by the limitation of time to complete the study.

The study used open-ended questions, and follow up questions were asked of participants where it is warranted. These questions are aligned to the interpretive paradigm and suitable, given that the purpose of the enquiry was to obtain in-depth meaning and views of participants under study in relation to the research question under study (Tetnowski, 2015). The interviews were structured in a manner to obtain expertise and actual experience of participants' experiences with strategic management of digital transformation and innovation diffusion.

3.3 SELECTION OF PARTICIPANTS

The study applied an organisational level view, with a limited focus at an individual level, which is in line with common practice in social science studies (Edmonds & Kennedy, 2019). The study is focused on DFIs in South Africa that are undertaking digital transformation strategies. Competitors of the DFIs were not considered as the study seeks to contribute towards research on digital transformation consideration for DFIs. The study is focused on the specific context, given the focus of DFIs being driving development impact and less on profit generation, which tends to be a focus for other financial services providers. Due to constraints of time and access to information, the population of this study was limited to two DFIs in South Africa. This population was suitable for this study as these organisations are two of the biggest DFIs in South Africa that are operationally sound and financially sustainable and operate in similar ways. These organisations have chosen to include digital transformation as part of their business strategy focuses in response to rising competition from new entrants, cost pressures and increased economic instability that is threatening their long-term sustainability. Their respective digital transformation journeys are heavily dependent on the adoption of technology innovations and their successful diffusion into the organisations.

The following attributes constitute similarities between the two DFIs:

- Type of organisation: DFI/national development bank
- *Ownership:* 100% state-owned by the South African government
- *Fund raising* funding raised from the debt market

- *Product offering/main business area:* development financing (debt, equity or combination of these)
- *Geographical footprint:* South Africa and the rest of Africa
- *Credit rating:* same corporate family rating; currently Ba3

Despite the above-stated similarities, the customer profiles between the DFIs differ. Customers of DFI1 comprise organisations, whereas customers of DFI2 comprise individuals and organisations.

Sampling strategy

According to Edmonds & Kennedy (2019), there are two types of sampling techniques. Probability sampling, normally used in quantitative studies, supposes that the sample is representative of the population, whereas nonprobability sampling, largely used in qualitative studies, selects participants based on specific criteria (Edmonds & Kennedy, 2019). Participants for this study were selected based on their availability and included those in charge of strategic management of the organisation, those determining the adoption of the technology into the organisation, as well as those in charge of the implementation of technologies chosen to be adopted by the organisation.

A sample of fifteen (15) interview participants were identified based on the profile of participants. These are the participants directly involved with the organisational processes that the study seeks to understand.

3.4 RESEARCH METHODOLOGY

The study seeks to understand the influence of dynamic capabilities on the diffusion processes of digital technologies in DFIs in South Africa that are undergoing digital transformation. An interpretivist paradigm was selected as an exploratory study was performed, meaning that there was a possibility of multiple considerations that the study would unearth that explained the phenomenon as data was collected and

analysed. Therefore, a qualitative approach was more suitable for this study to collect data and answer the research questions (Bhattacherjee, 2012).

The intention of the study is to obtain the best possible understanding of the relationship between seizing and reconfiguring dynamic capabilities that influence technology diffusion to enable digital transformation in a reality where there are multiple possible factors. Therefore, a qualitative approach is appropriate given the research problem as the data collected through the interviews was analysed to draw meaningful inferences from the responses in relation to the research questions (Edmonds & Kennedy, 2019). The study was conducted in a natural setting, where the social influences were accounted for in the study.

The outcomes of the analysis of the data collected from the interviews were compared to the literature of similar studies or studies containing similar theoretical frameworks. From this comparison, interpretations were drawn on the analysis, including the results compared against the theoretical frameworks framing the study.

3.4.1 Data Collection and research instrument

A qualitative method was applied to collect data due to the interpretive nature of the research conducted. Primarily, for qualitative studies, data is collected through conducting interviews and transcribing them to create data that can be analysed (Mills, 2017). Depending on the research problem, interviews can be *unstructured* (the only prepared question is the opening question), *semi-structured* (set of questions are prepared that guide the interview, but the researcher can deviate) or *structured* (the same set of identical questions are posed to every participant) (Mills, 2017). Given the exploratory nature of this study, semi-structured interviews were found to be more appropriate as a data generation mechanism to allow the researcher to amend questions and ask follow-up questions to obtain the in-depth information required.

The research instrument is included in Appendix A; it comprises a prepared list of open-ended questions that sought to answer the research questions, but this did not preclude follow up questions from being asked during the interviews. Each research sub-question relates to a group of questions contained in the research instrument:

- The main research question 1, *"How do DFIs manage their digital transformation strategies?"* is related to interview question 5.
- Sub-question 1.1, *"What is the role of dynamic capabilities in enabling digital transformation?"* is related to interview question 6.
- Sub-question 1.2, *"How does the diffusion of technological innovations enable digital transformation?"* is related to interview questions 7 & 11.
- Sub-question 2.1, *"What are the seizing dynamic capability factors that influence technology innovation diffusion?"* is related to interview questions 8, 9, 10 & 12.
- Sub-question 2.2. "*What are the reconfiguring dynamic capability factors that influence technology innovation diffusion?"* is related to interview questions 13 & 14.

The semi-structured interviews were conducted with employees in two DFIs in South Africa; specifically, with those involved in driving the digital transformation of the organisation, those determining the adoption of the technology into the organisation, as well as those in charge of the implementation of technologies chosen to be adopted by the organisation. The interviews were held virtually using the Microsoft Teams platform. Another source of data was obtained from interviews with external commentators, who hold expert knowledge in strategic management of digital transformation strategies. Consent was obtained from all participants prior to the commencement of the interviews. The interviews were recorded, copies of these recordings have been stored in a secure manner. All responses were transposed into transcripts and validated with both the participants and the recordings to ensure the accuracy of the data collected.

3.5 DATA ANALYSIS

In alignment with the interpretivism paradigm selected to conduct this study, an interpretive data-analysis strategy was followed (Creswell, et al., 2016). The analysis strategy was driven by the research questions which this study seeks to answer (Tetnowski, 2015) and was conducted in parallel to the data collection. The data collected was organised to enable analysis through transcribing of the interview

recordings, after which the data was coded and then presented in various forms (tables, figures and text) (Braun & Clarke, 2006). The data was analysed and coded using Microsoft Excel.

A thematic analysis approach was adopted to analyse the data collected. As data were collected from conducting semi-structured interviews, the thematic analysis enabled the clustering of data into categories of significance, as well as the identification of similarities and trends by the researcher, which were then interpreted and comparisons were formed and discussed (Creswell et al., 2016; Braun & Clarke, 2006).

This analysis approach enabled the collection of experiences of participants of the study and the comparison of their experiences against the theories included in the literature review for validation of the theories or the uncovering of emerging factors overlooked by the theories. As data can be interpreted in multiple ways, to focus the data collected in this study, strict coding practices were applied to this study. (Sandelowski, 2011)

As open-ended questions were asked of the participants, their responses varied at the initial outlook, but the analysis approach enabled the dissemination of the essence of these responses.

3.6 LIMITATIONS OF THE STUDY

- The data was collected from employees from two DFIs, due to the researcher's limited access to participants from other organisations. South Africa has 11 national development banks. Of these, the researcher's access to potential participants was limited to two of these, who are similar in nature, as explained in section 3.3 above.
- The researcher is currently employed with one of the DFIs under study; the impact of the objectivity of the researcher during the conduction of the interviews was considered, specifically with participants from the same

employer. The participants were made aware that the researcher is employed with one of the institutions under study.

- Some interviewees may have provided responses that they thought the researcher was looking for, which may impact the study results.
- Conducting the interviews using a virtual platform may have impacted the communication between the participants and the researcher and their responses.

3.7 ETHICAL CONSIDERATIONS

The study was conducted in line with the institutional ethical principles and policies. This included the following:

- The data collection instruments, participant letters, and consent letter were submitted for approval by the institution's ethics committee;
- Participants were not unduly influenced to participate in the study, nor were their responses be influenced in any way;
- The identities of the participants will be treated with the utmost confidentiality, and the purpose of the study was explained to them;
- Research outcomes will not be tampered with or altered in any way.

3.8 RELIABILITY AND VALIDITY

As a qualitative approach has been selected for this study, considerations have been included to amplify the trustworthiness of the study as well as the validity of the instruments utilised:

- The data findings were confirmed with the participants;
- The data collected was validated with experts to breach the limitation of lack of interview experience by the interviewer;
- The researcher's bias was clarified prior to the commencement of the research;
- Additional digital tools, specifically Microsoft Teams, was used to capture the participants' responses in order to confirm observations of the researcher during the interviews.

3.9 SUMMARY

A qualitative study was adopted as the research methodology for the study, where semi-structured interviews were conducted with representatives from two DFIs in South Africa to collect data and experts in the field of digital transformation. The interview questions in Appendix A are open-ended as an interpretivist approach has been adopted to conduct this study. The interviews were conducted virtually and recorded. The recordings were transcribed using transcribing software, and the transcripts were validated back to the recordings by the researcher.

An inductive approach was selected for this qualitative study, where the causal relationship was explored between the micro-foundations and antecedents of dynamic capabilities and those of innovation diffusion in an environment undergoing digital transformation.

The case study research design was found compatible with the intention of this study, considering the context of the study being set in DFIs currently operating and the interactions of variables of the study.

Interview participants comprised of employees from the DFIs forming the population of this study, as well as experts in the field of digital transformation. The data collection method selected for this study is conducting semi-structured interviews; given the exploratory nature of the study, this methodology allowed for customisation of questions for participants and follow up questions to be asked where necessary.

The data collected from the interviews were compared to the literature review conducted. From this comparison, interpretations were drawn on the analysis, including the results being played against the conceptual framework and propositions framing the study, which is explained in the ensuing chapter.

CHAPTER 4: PRESENTATION OF RESULTS

4.1 OVERVIEW

4.1.1 Brief introduction

The results of the study are presented in this chapter; based on the semi-structured interviews conducted with participants. The respondents comprise employees from two South African DFIs as well as experts in the field of digital transformation and innovation management. The profiles of the interview respondents and the process followed to analyse the data are outlined. A thematic analysis approach was followed to analyse the data obtained from the interviews.

4.1.2 Background Profile of Respondents and Process Followed

Interviews were conducted virtually with Fifteen (15) respondents using Microsoft Teams. The interviews were recorded and subsequently transcribed utilising transcription software (Otter.ai). Of the total interviews conducted, 12 of the respondents comprised employees from two South African DFIs.

Participant	Institute	Business area/function	Level of accountability	Tenure within DFI/expert field
1	DFI 1	Innovation and Culture	Senior Management	23+ years
2		Innovation and Culture	Senior Management	6+ years
3		Innovation and Culture	Executive	11+ years
4		ICT	Senior Management	3+ years
5		ICT	Middle Management	5+ years
6		ICT	Specialist	6+ years
7		Corporate Strategy	Specialist	4+ years
8		Corporate Strategy	Specialist	13+ years
9	DFI 2	Corporate Strategy	Senior Management	25+ years
10		Corporate Strategy	Middle Management	6+ years
11		Corporate Strategy	Specialist	1+ year
12		ICT	Specialist	15+ years
13	Institute of Technology	Innovation and technology	Executive	8+ years
14	Various	Transformation	Executive	4+ years

15	Research institute	Research and Insights	Analyst	25+ years

Table 3: Interview participants profiles

The data was analysed against the insights obtained from the literature review conducted in this study. The data was analysed using a thematic analysis approach using guidelines proposed by Braun and Clark (2006). The thematic analysis approach is compatible with the constructionist paradigm of this study and is theoretical approach agnostic, allowing for flexibility as the data was analysed (Braun & Clarke, 2006).

Detailed analysis process followed in line with the approach outlined by Braun & Clarke (2006):

1. *Familiarise yourself with the data*
   The interviews were transcribed using an online transcription service, Otter.ai. The transcriptions were then validated against the recordings to validate the accuracy and completion of the transcripts and to familiarise the researcher with the data.
2. *Generate initial codes*
   First cycle codes were highlighted on copies of the transcripts. Microsoft Excel was used to populate second cycle codes categorised by interview questions, as the data was further analysed.
3. *Searching for themes*
   Initial themes were identified based on the codes. These themes were refined as the data was analysed and quotes collected and tagged against the themes identified. The data set of themes and codes were populated on Microsoft Excel. The themes were then grouped based on commonalities identified in the themes.
4. *Reviewing themes*
   The themes were reviewed and refined to themes that would be relevant to answering the research questions.
5. *Defining the themes*
   The final themes were defined and are presented below.

6. *Producing the report*

   The data results and findings are presented below. The themes were grouped by frequency of emergence of the theme.

4.2 PRESENTATION OF FINDINGS AND DATA RESULTS

The data results presented below have been arranged in accordance with the research questions and the interview questions linked to the respective research questions. Using a thematic analysis approach, key themes were identified and presented in graphs per interview question, indicating the frequency the theme has been highlighted by respondents.

4.2.1 Results pertaining to Research Question 1

RQ 1: How do DFIs manage their digital transformation strategies?

This section outlines the findings with regards to Research Question 1, which is aimed to obtain an understanding of how digital transformation is defined within DFIs in relation to a wider understanding of what digital transformation entails.

What is your understanding of digital transformation?

Based on the responses received, all respondents confirmed various elements of the understanding of what digital transformation is, especially in the context of DFIs. The key themes are described below:

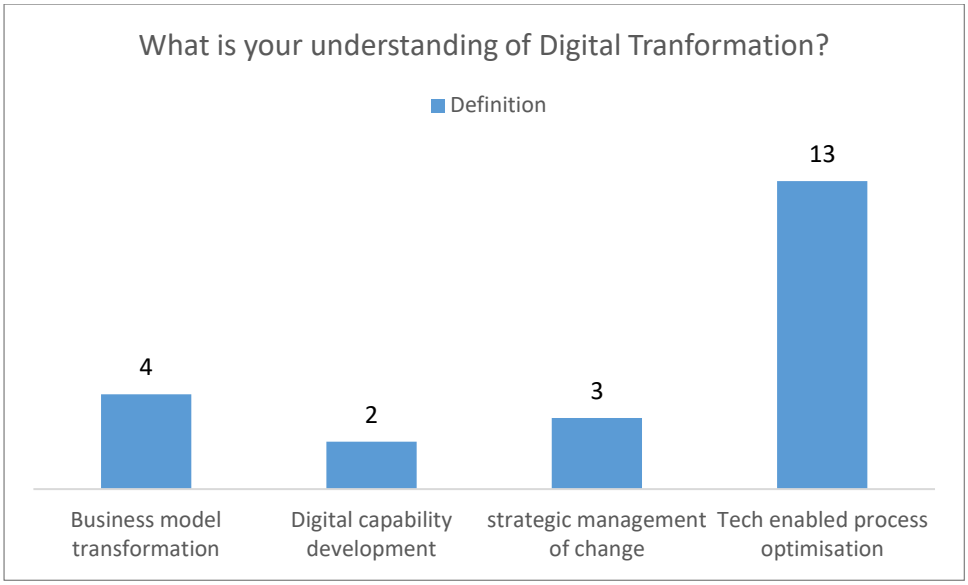

Figure 3: Definitions of digital transformation

Four respondents associated digital transformation with **business model transformation** or business model innovation:

> *"[…..] it would be about business transformation. So, end to end; from the full spectrum of business transformation of an organization."*

> *"[….] it's part of what we call your business model innovation. It really completely transforms your business model in terms of how you do things. And that's really how we define or unpacked, what we call your digital strategy within the organisation."*

Three respondents associated digital transformation with **digital capability development**, i.e., they responded that digital transformation involved building digital capabilities for effectiveness in the workplace or supporting other activities of the organisation:

> *"[…] the digital capabilities at {DFI 1} […] it would be those capabilities that would assist the bank in achieving some sort of efficiencies and enablement; and then the other would become capabilities that could adopt, in order to provide some sort of competitive advantage."*

> *"[….] you just trying to simplify what you do in a digital manner."*

Three respondents highlighted that digital transformation was associated with the **strategic management of change** within their organisation. This included achieving the organisational strategy and the change required to achieve it:

> *"Digital transformation looks at all the tools, the processes and services that an organisation can use to almost enhance the strategy or accelerate the achievement of the strategy."*

> *"So, at the {DFI 2}, we understand that we must educate the business that they must understand that technology can help us with growth. […] So, the data that drives our decisions are always old; it's always retrospective and that that makes us very slow to change direction."*

All 13 respondents associated the biggest part of digital transformation with **technology-enabled business process optimisation** through automation and adoption of enabling tools to assist with decision making or process efficiencies:

> *"[…] I don't want to water it down to just automating that but making the process a digital process so that you can work out what can be automated and then keep the core important pieces as relationship pieces [….] The word optimising for me always comes up with digital transformation. It's about optimisation."*

> *"[…] how the organisation makes available digital technologies that help them […] achieved value, or efficiencies […] overall doing things using these technologies. […] in certain cases, it could be automating things […] it could be making available things in a different way. Or even improving to the previous way of doing things. But the key is, with the use of technology, digital technology."*

> *"[…] digitalisation is important in that it would bring many benefits to the organisation in terms of streamlining processes."*

> *"Digital transformation entails number one, making sure that you use technology in the most efficient way, in order for you to make your processes efficient, to make the way in which you deliver your service efficient, whether it be from a cost perspective, in terms of streamlined processes, trying to make sure that you enable your technology to do functions that will primarily be done manually."*

> *"[…] it's really for me how can we incorporate technology or the new technologies in our day-to-day lives, to improve the way we do things or to improve the accuracies."*

Although most participants were aligned in terms of what digital transformation is, in the context of the DFIs, it was highlighted that within their respective organisations, there were conflicting understandings of what digital transformation is meant to represent:

> *"So, if you think about how I look at it is, we have an old business model. But we're going to apply digital transformations/ optimisation techniques, technologies to enable that business model. That's how I almost distinguish between where we are, which is, my view is, we're not changing the model. But we are taking the model we have; we are optimising digitally, as opposed to saying, you know, the model, maybe request changing, or it's fine, what it is."*
>
> *"Everybody knows that technology and tools can improve things. But there is not a deep understanding at {DFI 2}, how are we going to transform ourselves to make it a helpful tool rather than a burden."*
>
> *"However, it is how we then make an impact based on what we are seeing happening. It is not well understood."*
>
> *"I think the heart of our organisation is not yet digitally focused. I think that there's maybe room to grow in our understanding of how digital is important to a DFI and how digital can make our jobs easier; can actually enhance the quality of people's lives."*

Of the Twelve (12) respondents working in DFIs, seven attribute the understanding and level of digital transformation within their respective DFI to the level of digital maturity as well as the state of the organisations' data maturity:

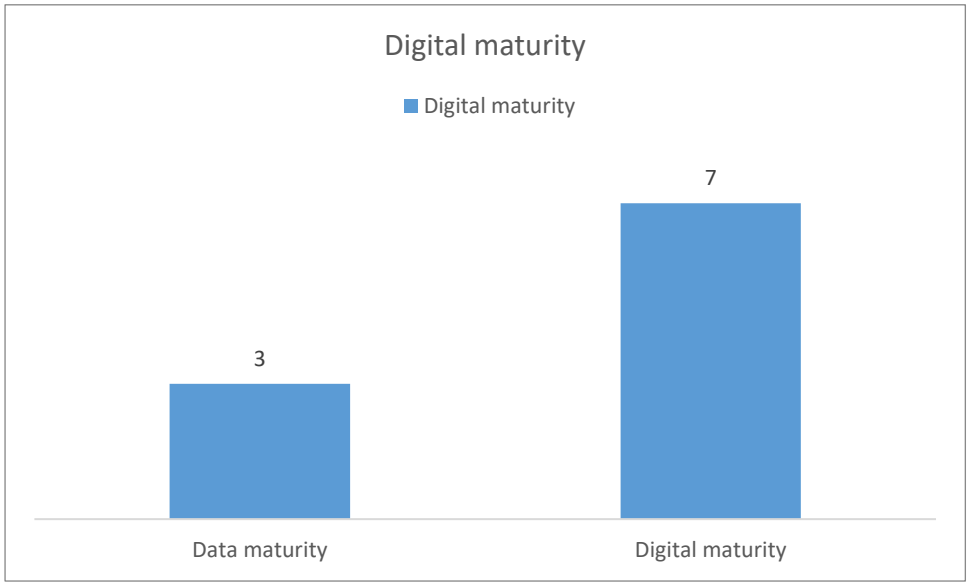

Figure 4: Digital Transformation within DFIs is a function of the digital maturity

“So {DFI 2} as an organisation is still a baby when it comes to digitalising everything [….] So, we're not agile, and the productivity is spent in the wrong place.”

“If I were to use the maturity level, maybe one to five, I'll say we probably maybe sit in between one and two. And I think the reason why I say that is that you know, without proper buy-in, things are left for middle management and the teams.”

“If you take it to {DFI 1}... where we are, I think I would say if I was using the maturity level, the 5 level Maturity Model, I’d say, we are probably a two.”

“I do think that from {DFI 1} perspective, we probably are being impeded by the maturity level of the organisation overall. […] probably {DFI 1} is sitting at around three.”

“Because our maturity in terms of being digital, being transformational in the way that we think about finding solutions and being innovative, it's not where it should be.”

4.2.2 Results pertaining to Research 1.1

This section outlines the findings with regards to research question 1.1, which is aimed to obtain an understanding of how digital transformation is managed and implemented within DFIs and expert views based on other organisations.

R1.1: What is the role of dynamic capabilities in enabling digital transformation?

What do you think needs to be in place to enable digital transformation?

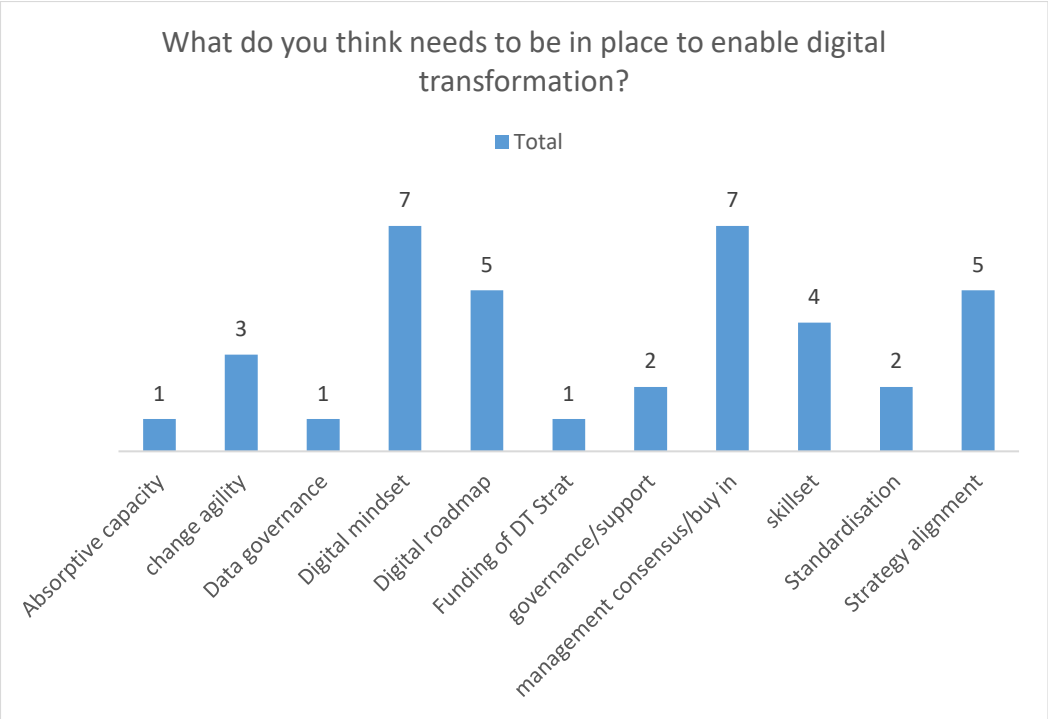

Figure 5: Enablement of Digital Transformation

The main themes that emerged from responses with respect to enablers of digital transformation and the extent of these in the respective organisations are outlined below:

Digital mindset

Seven respondents replied that a **digital mindset** was critical to driving the digital transformation strategy or how a lack thereof impeded progress:

> *"So, you must have a digital mindset that you constantly think of; is there a better way of doing business? How can I improve my day-to-day doings by use of technology? And that's not the systems and tools thinking; it's just how can I make life easier."*
>
> *"So, I think it has to start at the top. So there needs to be a culture that is adopting digital, the digital toolkit."*
>
> *"So, the organisation needs to have a mindset that is accepting of this and willing to change."*

Three of those respondents emphasised the importance of leadership driving a culture of adopting a digital mindset:

> *"So, I really think it's a leadership challenge, where we don't have leaders who are willing to take a risk and explore opportunities that are out there in the*

market that could potentially influence the way in which we work through mechanisms like digitalisation."

"[…] to digitally transform leadership, probably it's at the core of it. And leadership, not just in the traditional sense, but leadership in the digital transformation era."

Management consensus and buy-in

All respondents confirmed **management consensus and buy-in** was critical to enabling digital transformation within their organisations:

"So, we try to get first that education there, to embed digital leadership thinking that our middle management, executive management are constantly thinking about improving and using technology as one of the enablers in doing that."

"I do not think that there is an executive that is actually willing to take the risk. I think they […] first think of a failure versus saying, but if we then maybe take that risk and support these initiatives, what would be the outcome?"

"The influence should be from all group executives because they can influence their teams to actually make sure that they fully understand and buy into that particular digital transformation."

"Utilising technology starting obviously with our senior management team, which is the group executive - getting that buy-in."

"To have buy-in from senior management, that they need to understand how this is going to help them out, they're going to, you know, how they're going to improve the organisation."

Formulation of a digital roadmap

Five respondents identified the **development of a digital roadmap** as an enabler of digital transformation and acknowledged that it was a process still in its early stages within their respective DFI organisations:

"We developed the strategy, post that we developed what's called the roadmap to get to the end; to say, what does 'good' look like."

"We might have an idea of change, we might have an idea of digitisation, all of these things, but we still need to look at our environment and chunk down the steps of what's doable according to our environment. whether that is, all other

deliverables that we need to achieve, the internal capabilities, the relevant people who can be assigned to the tasks."

"And then after that, then are the next steps - implementation plan, and then managing change, also, very importantly […] also making sure that you've got the latest and best technology that can be used in the process."

Ensuring there is strategy alignment

Five respondents highlighted that ensuring that there was **strategy alignment** was critical to driving digital transformation:

"We kind of need to make sure that [….] the prioritisation is not necessarily only driven from a technology perspective."

"I think it also needs to be a reason for doing it. So, let's not just say very broadly, we're going to go digital […] Digital can literally infiltrate every sphere of what we do. […] So, again, it comes back to the alignment to the strategy of the organisation."

"I think if we are to really be serious about digital transformation, we need to have this very high on the agenda. […] But I don't think there is a concerted effort to say, how do we actually, you know, put this on the radar and resource it and ensure that we measure it continuously."

Ensuring there is the right skillset

Four respondents highlighted that ensuring that having the **right skillset** to execute the strategy was critical to driving digital transformation:

"But not one of them has like an overarching, helicopter view of what is going on regarding technology in the {DFI 2}."

"It's skills, right? Skills across the organisation, {from} top to bottom? And coupled to skills, [….] the ability to sustain those skills […]."

"It's definitely, number one, the resourcing, in terms of the skillset. Number two, it's strategic attention from a leadership perspective."

Change agility

Three respondents mentioned the level of **change agility** (change management capability, speed and level of adaptability and change culture) the organisation had impacted the ability to drive digital transformation:

"[…} it is a mindset change. So, we work on that mindset, firstly, and we've got initiatives driving that. That's a bit of a culture change, change management exercise."

"The first one is that you obviously have to have an organisation where the environment is able to adopt the proposed digital transformation, and this is not withstanding […] the hardware and the software. You're talking about the change capability in the organisation in itself"

Governance and support to drive the digital transformation strategy

Two respondents mentioned the importance of having the **supporting governance** structures to enable digital transformation:

"[….] you need to have the infrastructure, [….] the structures in place that's going to be able to support that."

"…where we have a team that's focusing on the automation of processes, you have a team that is responsible for almost the end of the line [….], it's our job to make sure that the business is digitised that our processes are digitised."

Standardisation

Two respondents mentioned **standardising** processes and operations to make digital transformation easier:

"That's almost the first part of the process, to standardise the process, and you decide to digitise it as much as possible where you can."

Absorptive capacity

Developing **absorptive capacity** was highlighted by one respondent, stating that "*Fostering the culture of a learning organisation"* was critical to enabling digital transformation.

Data governance

Data governance was highlighted as critical to enabling digital transformation:

"Data governance connects business and data strategy to information policy; that really talks to the policy of the organisation. Making sure that the policy tells the entire lifecycle of what, why, when and how."

Funding of the digital transformation strategy

One respondent highlighted how the **availability of funding** for the digital transformation strategy enabled the strategy execution:

> *"Funding is very key […]. I think the organisation is stable enough to sustain a digital transformation drive."*

4.2.3 Results pertaining to Research 1.2

This section outlines the findings with regards to research question 1.2; an understanding of how the diffusion (selection, adoption and implementation) of technological innovation achieve the objectives of digital transformation in organisations.

R1.2: How does the diffusion of technological innovations enable digital transformation?

How does the organisation operationalise its digital transformation strategy?

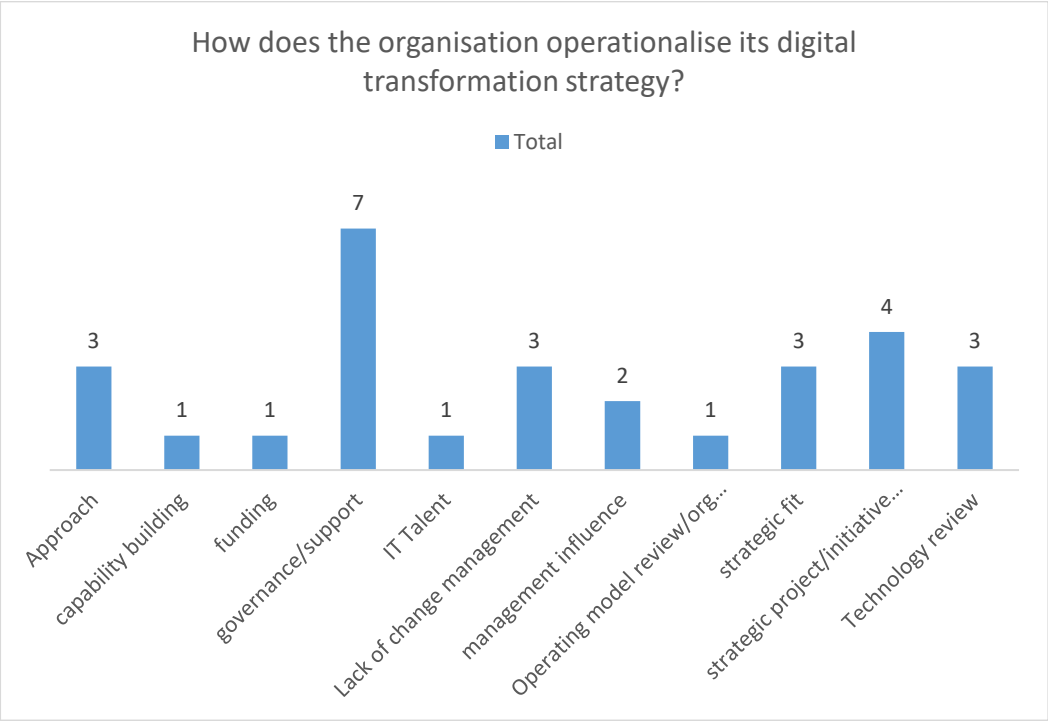

Figure 6: Operationalising the Digital Transformation strategy

The key themes identified with regards to the operationalisation of digital transformation are:

Establishing adequate ***governance and support*** was highlighted by seven respondents as the key component of operationalising the digital transformation strategy of the organisation:

> *"We even developed a steering committee {4IR Steerco}, a Steering Committee that is able to tell you who must sit where and what must people do."*
>
> *"But the fact that we are able to take these things to Exco, it's a positive. It shows that {there} is high-level interest and there is seriousness."*
>
> *"If you don't have your Chief Technology Officer and your Chief Risk Officer in the C-Suite, they need to make sure an internal team is appointed solely responsible for the implementation of the strategy. To have to make sure that the digitisation and organisational implementation of the strategy is entrenched."*
>
> *"Other organisations and those that are doing well - what you tend to find out there is clear organisational structures […] support structures that have been put in place right. To manage this [….] top to bottom."*
>
> *"And the infrastructure, by the way, is also a big part of, of, you know, will be a big part of that, you might find that that you want to implement it, but there's no infrastructure, and it becomes a hindrance, or maybe now you first have to deal with the infrastructure before you can start implementing your digital projects."*

Four respondents confirmed the ***formulation of strategic projects/initiatives*** as ensuing activities to execute the digital transformation strategy:

> *"We've got a strategic initiative for the total digital transformation of {DFI 2}. It's broken down into different parts […]. And then we've got a number of projects looking at specific sides of {DFI 2}."*
>
> *"Ultimately, you need to be able to have initiatives that all talk to what your strategy is saying. And then you start putting together a way of driving those initiatives, measuring them, ensuring that you are actually making progress on them."*

"It's to really go through the organisation and find out what as a start, where are, the bottlenecks, what's holding us back, what's making us maybe not lead, what's making us slow, what are our pain points and consider in those in those areas."

Ensuring there is a ***strategic fit*** was highlighted by three respondents as critical to ensuring the strategy is correctly executed on:

"We not only looking at technology […] the enablers; we look at the new ways of work, the client journey optimisation, the experience of the clients. So, we don't only look at the tangible - we also look at what they experience and feel about it is in the process, and also the intangibles. And what you can get better in this journey. So, technology must be the enabler, not the thing."

"I think within the organisation […], the expectation is that the technology piece is the one that drives it, which becomes difficult […]."

"[…] fit the strategy […] with their needs. And then once you've got that aspect taken care of, when you busy implementing it, at least when they're also involved, they can also see that, you know, what they've requested is coming to fruition."

Three respondents highlighted that as part of the execution of the digital transformation strategy, ***performing a review of current technology*** within the organisation is critical:

"You […] need to revisit the type of technologies you have. You probably need to introduce or enhance some of the technologies or even sunset some of the technologies."

"You need to obviously then review what is currently in place, in terms of saying, from an organisational perspective what would it be in order to determine what the point of arrival of success factor would look like."

Respondents highlighted the ideal ***approach*** to be followed in relation to the contradictory approach present in their respective organisations

"Those high-performance teams are not siloed; you should actually be fusion teams, where you can just collaborate."

"Without proper buy-in, things are left for middle management and the teams [….] It is left to them to make decisions broadly for the sponsors are not necessarily actively involved with the making sure that we can operationalise the digital transformation."

Two respondents emphasised the ***level of management influence*** on the execution progress:

"That executive must make sure that the strategy is embedded and driven through making sure that he or she assists {DFI 2} staff that's embedded internally. Externally, he needs to engage with the clients and the markets, to really make sure that it is aligned"

"We've got the right sponsors; we've got the right interests trying to drive."

The following themes were highlighted by one respondent as additional key components to implementing digital transformation strategies:

Capability building

"So, when you talk capabilities […] could be that you need to upskill, could be that you need to bring in new skills."

IT Talent

"Our IT talent - I think that's one aspect {where} we really lack behind. I don't think the IT talent is sufficient to meet the demand of digital transformation."

Funding

"But I think that the most important factors […] would be obviously to have the implementation plan in place, also, to have the funding and the resources to achieve that."

Operating model review

"Now, once you have your digital strategy, it will start, you know, directing you in terms of what are the gaps for you to realise that strategy. Then you will begin to realise that probably you need to revisit your model […] your operating model."

Inhibitors highlighted by respondents with regards to the execution of digital transformation strategies or objectives related to:

Lack of change management

"….it is one area that we do lack […] the change management component isn't really understood."

"Because change management is a slippery piece, internally. So, I think if the team comes together and there's a full change plan with all of those stakeholders."

What informs your organisation's decisions to invest in new technologies?

a. How does your organisation decide to explore new technologies?

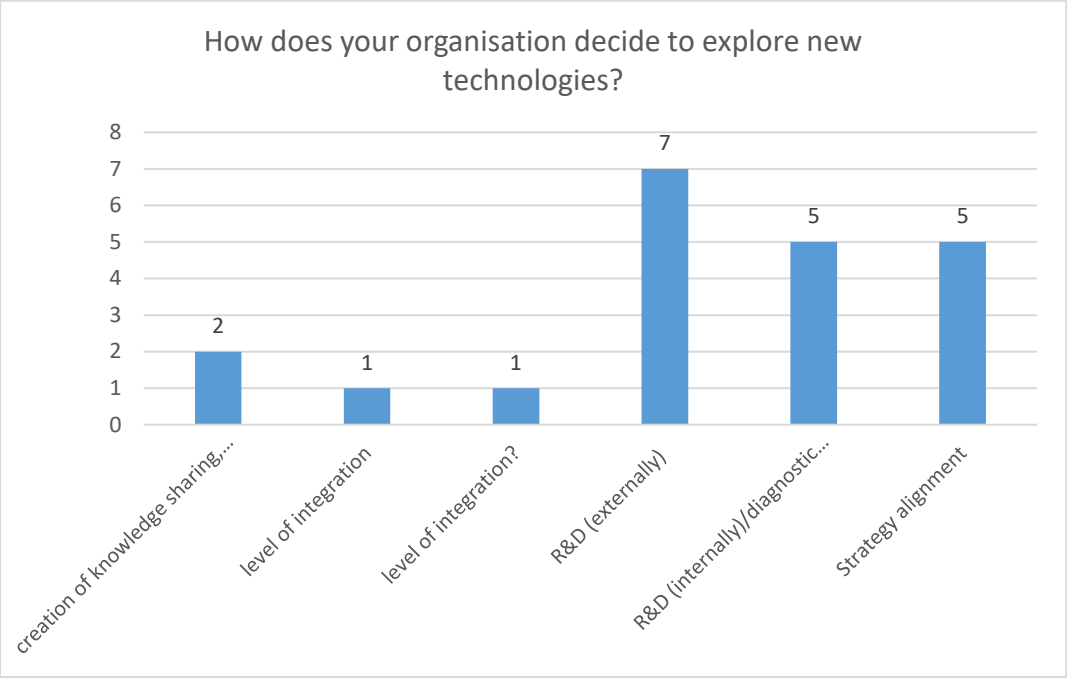

Figure 7: Factors influencing the decision to explore new technologies

Factors that influence how the organisation decides to explore new technologies are:

Research & Development (that is externally focused)

Seven respondents highlighted that the exploration of new technologies is informed by research conducted with external sources and stakeholders:

"The macroeconomic environment and also your competitive environment […] if we find someone in the market is doing something better and a lot faster than we are and are more efficient, it might cause us to actually reduce our competitive advantage. Then in order to remain competitive, we might want to invest in new technology."

"And go out there to say comparatively with your peers at this level […] the world over, to say these are the technologies that they're using to do the similar work that you do, so we think this is what you need to do."

"…it has actually helped us, and I think that's how we, we actually feel that we are leading on certain things, because if we are not clear, it's easy that we can

ask those questions, get an industry-wide view, within the financial services specifically."

"But we also consider the trends […] we keep our tabs very close to what the trends looking like, where's the industry going [...] We are also fortunate in that we also have a subscription […], which we also are sometimes able to tap into the research coming out of that. Sometimes, where necessary, we are able to actually put it out to the market in terms of RFIs (request for information)."

"We're always looking at new technologies, exploring, but I think one of the biggest things that we try to ensure is synergy; and, and that whatever systems are in place, can easily integrate so that there's less duplication, and there's, like a greater efficiency."

Research & Development (diagnostic and internally focused)

Three respondents mentioned that insights and suggestions are gathered from ***within the organisation***:

"Some emanate from previous experiences, both of what we've done in the bank, to the experiences of the people we have in the bank […] about what they have done previously."

"If there's a need for technology bottom-up […], we do micro scanning of what are the challenges, what are the needs and build on that and then make a business case [….]. So go throughout the whole organisation; once you've done that, your diagnostic assessment, come back to say this is what you find. And what are some of the opportunities that you are picking up to drive this? You do this via surveys, interviews and everybody else within the organisation."

"What we kind of do is more of doing research […] not only from a technology perspective but also from a business perspective, you know, to say, you know, will there be an appetite for this change?"

"When the strategic objective for innovation was entrenched; the needs that were arising from there drove a lot of the need to explore new technologies […] it's very needs-dependent, like in our spaces where the need has arisen, then they have gone and explored the new technologies."

Strategy alignment

Five respondents highlighted that the decision to explore new technologies was also driven from the ***organisational strategy*** set or alignment to the ***technology architecture strategy***:

"It's […] having an understanding of business strategy. […] understanding business imperatives."

"Based on the gap analysis that's determined from the conversations within the organisation which traditionally happens during management strategy planning to determine where the organisation is. It is during those conversations that we obtain these insights into the organisation and then {we're} are able to determine what those gap analyses are. And based on those gap analyses, it gets put forward irrespective of whether or not there's an investment proposal for these new technologies."

"From the IT side, we're always looking at new technologies, exploring, but I think probably one of the biggest things that we try to ensure is synergy; and, and that whatever systems are in place, can easily integrate so that there's less duplication, and there's, like a greater efficiency."

Creation of knowledge sharing, integrating and learning

Some challenges were highlighted in the context of DFIs with regards to knowledge sharing mechanisms and integrating lessons learnt into future considerations:

"I don't think we've got differences in what is done; it's how it's done. It's the biggest difference in the speed, how it's done. They {private sector companies} can fail quicker, or they can succeed and scale quicker. Because there are no constraints."

"IT does not have enough people that really understand the core of the business and the way the business works and what the real business requirements are."

b. What considerations are made with regards to choosing an appropriate technology?

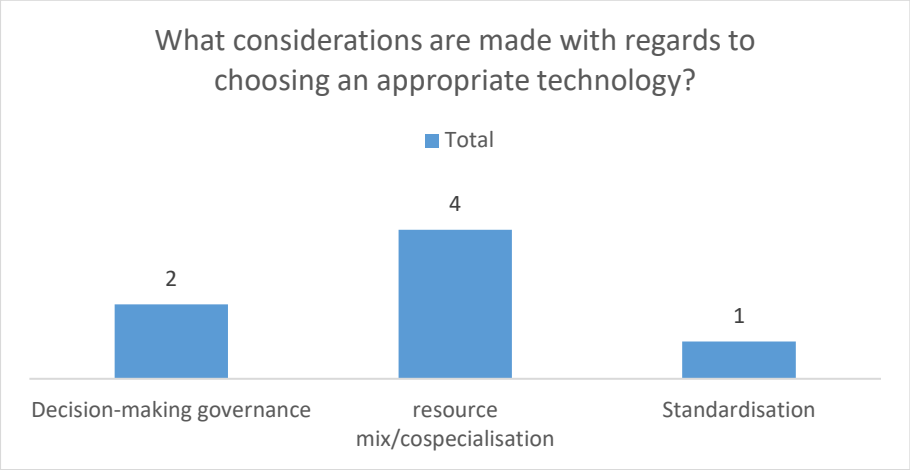

Figure 8: Considerations in choosing the appropriate technology

Key themes identified that highlight the considerations applied in selecting appropriate technology in organisations are:

Resource mix/co-specialisation (from a strategic fit perspective)

Four respondents highlighted the importance of the ***strategic fit*** between the technology to be implemented with the business need or strategy to be achieved:

> *"So, the biggest thing is the fit to the fit of purpose …, or the solution fit, or the technology fit to your capability model […] And so that's the biggest consideration - a fit of that particular technology in addressing a business concern, a business need, capability [….]*
>
> *"We are driven by what our strategy says. Because our strategy, ideally, is supposed to talk to the four pillars of people, processes, technology and finances [….] on the technology side, we would have been able to determine […] in order to execute this strategy, technologically, this is what it means."*
>
> *"So, it'll have to make sense for the organisation, and currently, that is a gap as well. It's a huge gap within the organisation because no one is actively driving it or doing it […] that's done at a superficial level, but we don't have levels of strategic analysis to have then gotten to the point where you're able to do an in-depth analysis."*
>
> *"I think what informs is accessibility of the technology and ease of implementation [….] The technology must be accessible, it must be affordable, and you need to have the skills, although the skills can be eventually built over time, to innovate and build."*

One respondent highlighted this as an ongoing challenge within the organisation:

> *So, if you take it home to us, I don't think we have that level of {how} it needs to be realisable. And if it's not realisable, what happens? I don't think we had that. I think we are more at doing the basic and high-level assessment."*

Decision-making governance

Two respondents highlighted that having a ***governance structure that influences technology investment decisions*** was critical to ensuring the appropriate technology is selected:

> *"It is really essential that {DFI 2} must develop and really embed the Chief Information Officer/ Chief Technology Officer role – somebody that's got a very high-level appointment, an executive appointment that looks after the*

overall technology from information technology bit, the hardware, the software, but then also those intangible things; where, how things work together, what the business requirements are, and how things speak to each other."

Standardisation

The ***standardisation*** of technologies to ensure compatibility and ease of integration of technologies invested in:

"We also have standards that are a guide, you know, in terms of what we have standardised within our environment. So, we are looking for technologies that are actually going to not deviate from the standard. And that way, that then helps us ensure that everything works in unison."

4.2.4 Results pertaining to Research Question 2

R2: What is the relationship between dynamic capabilities and innovation diffusion?

This section outlines the findings with regards to research question 2, which is aimed at identifying the seizing and transforming dynamic capabilities that influence innovation diffusion by identifying the micro-foundations/influencing factors.

4.2.5 Results pertaining to Research 2.1

R2.1: What are the seizing dynamic capability factors that influence technology innovation diffusion?

What routines (processes/systems) does your organisation have in place to enable it to successfully introduce new technologies?

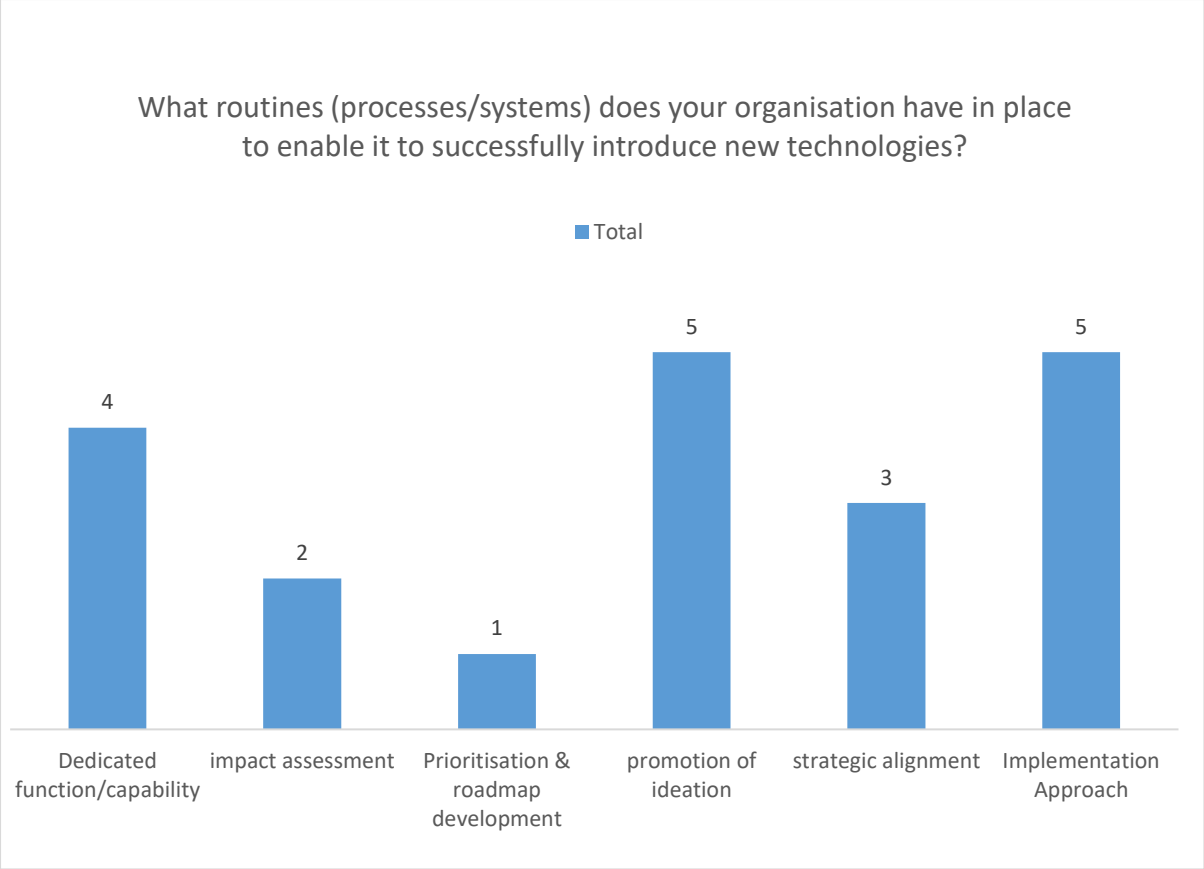

Figure 9: Routines for successfully introducing new technologies

Processes/systems that were identified as critical to successfully introducing new technologies into organisations were categorised as follows:

Promotion of ideation

Five respondents mentioned that having mechanisms and a culture that ***promoted the generation of new ideas***, some highlighted that it remained a challenge within their organisations:

> *"What we try to install is an imaginative mindset; that people forget about their constraints, that they forget about the experience and that they can actually, can sit and think but if I do this, what is the best way of actually doing it and dream a bit and then trying."*
>
> *"…you look for opportunities that are able to enhance your current processes."*
>
> *"And there is a bit of a culture of fear as well, you know, people just don't want to stand up and, and challenge things, you know, it's probably more*

challenging- because when you challenge something, it means that you can have possible solutions or proposed solutions that you can put on the table."

Experts also highlighted the significance of building a culture that promotes continuous ideation:

"If the organisation has that culture of growth and transformation, it will help make it a smoother transition. However, if it's an organisation which has been rigid and stoic all along, then whoever will head this hypothetical branch of the company will have their work cut out, especially when it comes to what we call resistance to change."

Implementation Approach

Five respondents commented on the ***implementation approach*** impacting the process of digital transformation. Specifically, highlighting entering into partnerships, approval processes and accountability structures:

"And then also in conjunction with that, making partnerships; creating an eco-partnership model. DFI 2 deals less independently and more in partnership with whatever stakeholders out there that could benefit what we need to do."

"So, we had to report to Exco every month and the various committees."

"So that can take anywhere up to a year, even more depending on the size and the cost of those […] it's the business case, then its approval, then budgets and then procurement and then the actual implementation of the new technology."

The following challenges were highlighted concerning the implementation approaches of the organisation subjects of this study:

"I think they are actually accidental. what is kind of missing for the organization for me, it is the cultural, organizational transformation that is required."

"We rely on that scarce, sparse skill sets within the organisation to implement. to the extent where we don't implement fully or to the extent that we've spent any money in bringing on board a new capability, that capability isn't adopted within the organisation, so it's a waste of money."

Dedicated function/capability

"And you've got your team of continuous improvement, the expertise around understanding the continuous improvement. We're then able to understand as an organization to say; we are lacking here. For us to be able to move with times, what are the gaps that we currently have? And how do we build on that?"

"There has been a Steering Committee established chaired by the CEO."

"So, for example, in terms of the digital capabilities - it is something that is usually driven not necessarily by the subject matter expert, it's driven from a point of interest."

"..it can have an innovation department of sorts, one that can be empowered with the necessary resources to partake in all those activities; to do the research to go out on the field, if necessary, to do the research, to go out on the field, to find the technology, or the system that can be used or what needs to be used to try to achieve that [....] that would be the sort of things that are needed to have that you know, the department and it must be properly resourced, with experienced people or innovative people, if you will."

Strategic alignment

Three respondents emphasised ensuring ***strategic alignment,*** which was also highlighted as a challenge by some respondents:

"I think that we tend to want to focus […] more on operational efficiencies [….] So as an organisation, as much as we do talk about client centricity, I don't actually think that we are there; we haven't moved the needle around that."

"…it's a pull and a push mechanism at the same time. It's a push in the context that we regularly look at the business strategy […] We do research based on the DFI 1 capability model and say there's a need to address this particular capability, and we almost push that to the business."

"What ultimately we do, as IT is actually coming from what is perceived as important business initiatives that the bank should be focusing on."

The themes stated below were mentioned by two respondents and less:

Impact assessment: Respondents highlighted that it was important to perform an impact assessment

"When the organisation would get that motivation {that} this is the technology, they would then look to see, to say, what is the impact on the business model in terms of cost? Is it reducing our cost? Is it increasing our revenue? Is it adding value to the client? Is it enhancing our brand? Is it enabling the building of effective partnerships? Is it creating capabilities that we didn't have before? So those are the different things that you'd look at within the business model."

Prioritisation & roadmap development; a respondent, highlighted the prioritisation of strategic initiatives and developing a roadmap to inform implementation considerations:

> *"We have two key processes that would follow. One is the prioritisation process. Two is the mapping of what is prioritised against the architecture roadmap. […]. now, what we do with those is we take these priorities, we take these business cases together and put them in one place and deliberate on them and get an approval of which are the projects that we should run."*

<u>What factors determine the level of organisational changes required for the implementation of digital transformation strategy?</u>

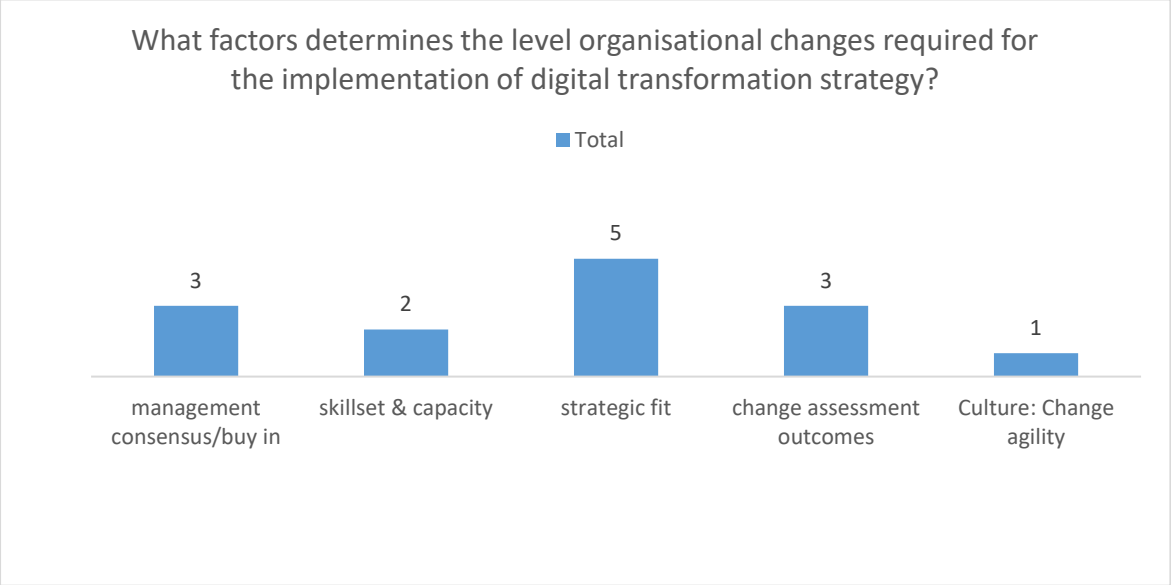

Figure 10: Factors that determine the level of organisational change for implementing digital transformation

Key themes of factors that determine the level of organisational changes required for implementing digital transformation are:

Strategic fit

Five respondents highlighted that ensuring a ***fit between the technology requirements/changes, choices required to be made, and the strategy*** determine are factors that determine the level of organisational change required for digital transformation:

> *"It's people, process, or people, technology, process or people, process and technology […] If we don't actually look at those three elements and say when*

you look at these three if they're all aligned, or in par, it becomes easier to then focus on your digital transformation."

"Is there full accounting of what the role of technology is in the strategy? […] those type of assessment because technology becomes more of a 'by the way' as opposed to saying it's in everything we do."

"The capabilities that we have currently were brought in to solve for a particular strategy at the time. The organisation has adapted, but the strategy has not responded. Therefore, the capabilities are there to respond to the old strategy and not the new."

"You understand the position, and you say, well, these are the choices that I want to make in terms of where I want to be. And this is how I then reconfigure my resources to achieve my strategy."

Experts concurred as well:

"In the beginning of the change management process, spend enough time trying to align and make sure that you know, you seek common ground in terms of this language, in terms of what it is."

Change assessment outcomes

Three respondents mentioned that the level of organisational change was a factor of ***change assessment*** outcomes conducted by the organisation:

"For the project specifically - we follow three phases. And the phases are diagnostic phase, then a design solution phase, and then implementation […] and then the technology stream that is the glue between these, so the technology stream and the client optimisation is working very close together."

"Remember that technology will be informed by what we have seen and done in the assessment to say, this is what we need, as an organisation to drive this."

"I think the biggest factor is the size of the change and who it's going to affect and how long is it going to take to make that change."

Management consensus/buy-in

Three respondents highlighted the importance of ensuring ***senior leadership sponsorship and consensus*** to drive the organisational change required:

> *“Sharing vision, sharing ideas, convincing others, trying to get people on their side - that this is the right thing to do. And I think it takes somebody who is really available and very visible.”*

> *“The sponsor usually determines the extent to which there is buy-in and commitment […] Your project plan would be based on that end-to-end adoption. But depending on who's the sponsor, the extent to which this will drive a short-sighted quick win. Then there is insufficient impetuses that is garnered or support is given to anything that seems to be longer term in nature.”*

Culture: Change agility

A respondent emphasised the importance of a culture that stimulates the ***change agility*** of the organisation to drive change associated with digital transformation:

> *“Culture is very important. You need to have a culture of people who are willing to explore, willing to learn - we still do have those, those who are very comfortable with what they're doing, they've been doing it that way for quite a while, and they are happy to continue doing it. But you've got those who have tasted that and have seen the power of digital transformation, digital technologies.”*

Skillset & capacity

Respondents mentioned the ***skillset and capacity*** impacted the level and extent of organisational change:

> *“When having the discussion about capabilities, we need to make sure the right people are assessing what is actually needed […..] A very specific leadership mindset orientated to the future of work. […..] to make sure there's a common understanding and capacity to, to ensure that the strategies are implemented.”*

> *“It is the people, which kind of talks about culture, not only culture but also the skill set and future roles.”*

Who is part of decision-making with regards to investment in new technologies?

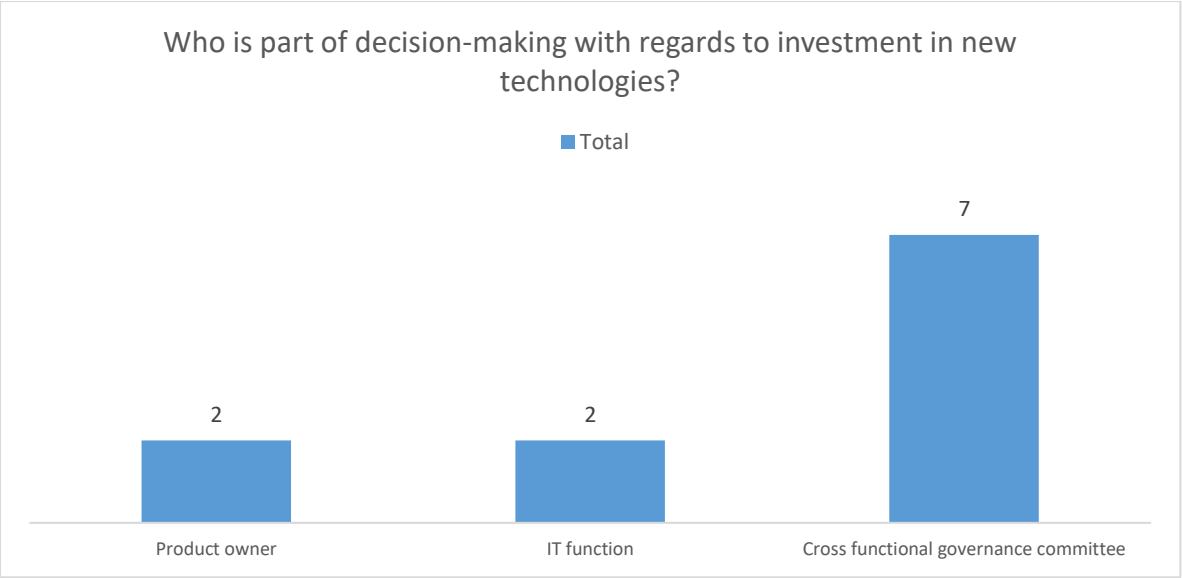

Figure 11: Participants that are part of technology investment decision-making

The participants who form part of the decision-making with regards to technology investment decisions are:

Cross-functional governance committee

Seven respondents mentioned having established multi-disciplinary governance committees that preside over technology investment decisions:

> *"I would work with the sponsor from ICT to determine what those technologies are, to be able to put together a business case, but they then go through a twofold process; the first will usually be with the ICT Steering Committee to determine whether or not this project would then be feasible [...] they then get escalated to corporate, and they get reviewed against all corporate priorities and then a decision is made to determine which investment to proceed with."*
>
> *"It was very intentional with leadership oversights, buy-in, very focused. So, it was dedicated; Time was given to it, and that's how they shifted"*
>
> *"…an executive decision would be made if it's a big technology. If it's a small technology, it probably can follow similar channels, but then just be approved specifically in the ICT team [….] And depending on how big that is and who's going to be affected, then it needs to go up the chains. And ultimately, it's always an executive decision to be made."*
>
> *"But as I've indicated, because these things are things that are coming from the business […] that final decision includes the involvement of the business, in terms of their business sponsor, business owner."*

This was also confirmed by experts:

> *"Some sort of decision matrix will need to be drawn up, the RACI matrix. We will include the CEO of the organisation [….] will probably just be responsible at a high level, but you just keep them informed. However, the manager for innovation will be responsible across all aspects. The Financial Manager also needs to be informed and consulted as well. The best way would be […] to have the RACI matrix and put the appropriate people."*

IT function

Respondents mentioned that sometimes the technology investment decisions lie solely with the ***IT/ICT function:***

> *"At this stage is still very much IT as a function and they are the primary decision-maker on technology. Here and there, a department manager or so can decide on a tool or software solution, but the primary decision-maker is IT."*

> *"…it is vested within the Chief Information Officer's office."*

Product owner

Experts also highlighted the importance of the ***Product Owner's*** involvement in the decision making:

"… it depends on the type of technology as well [….] But this decision ultimately was made by the custodians, you know, those responsible for it [….]. So, it is mostly the custodians of that product or that area that make the decisions, but there is input from IT."

4.2.6 Results pertaining to Research 2.2

R2.2 What are the reconfiguring dynamic capability factors that influence technology innovation diffusion?

How are changes to processes and capabilities as a result of the implementation of the new technology determined and resolved?

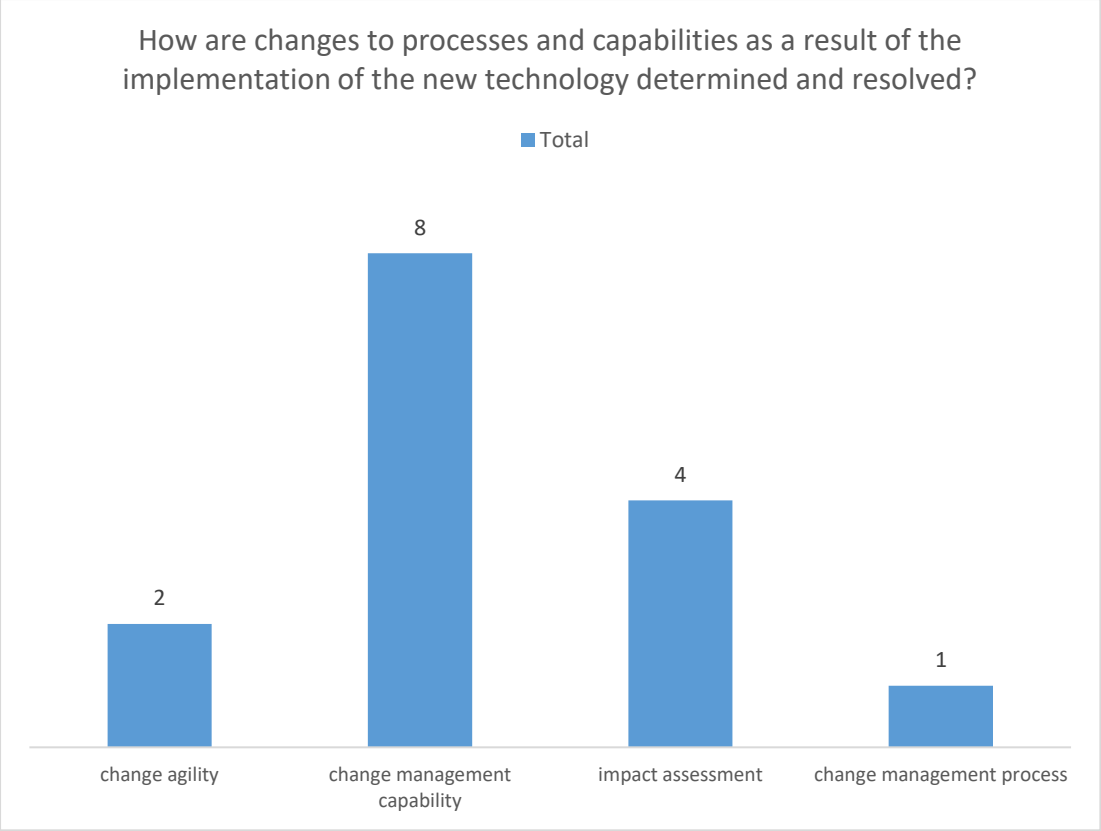

Figure 12: Change management considerations resultant from technology implementations

Considerations related to changes in processes and capabilities resultant from technology implementations are:

Change management capability

Eight respondents emphasised that changes resultant from technology implementation were managed by a dedicated **change management capability**. This was specifically mentioned by experts mainly:

> *"…the idea is to make sure that committee firstly looks at the processes that are being proposed and the changes and whether these processes that are being proposed talks to, firstly, that standardisation; secondly, the process that are being proposed, they're able to track them - what does success look like, as your key matrix that measures this thing."*
>
> *"Through the CoP (community of practice) [….] but we just fail sometimes in terms of following them up to implement them."*
>
> *"We have a change management team[...], So in that change, you need to detail what it is you'll be doing, how it will affect the business if there are issues, how you will then tackle that and whether you have a rollback plan as well. And in that change management committee, it'll have members that exist in different parts of the business, from financial management to operations - there's various members that make up that quorum."*

Lack of change management capability

Respondents from the DFIs mentioned the **lack of a dedicated change management capability** or inconsistency in change management practices:

> *"I think that's non-existent. And I think at the moment, the organisation's expectation is that technology is the one that needs to be driving it […], but it will definitely need a specialised resource […]."*

> *"We're good at process; we are good at capability, we are not so bad on implementation […] I think we are not so good. [.....] We don't have effective change management that {binds} together what we are good at, which is process, capabilities and slightly better in merging technologies. We don't plan to change at the beginning."*

> *"Change management, for me, it's a capability that you need to actively invest in. Manage it. Make it part of the culture [...] because there's no change management capability."*

Impact assessment

Four respondents highlighted performing **impact assessments** to determine the level of change required and planning for that change:

> *"And these would have been fleshed out during the requirement phase through the business analysis. So, at that time, when the solution is actually put on the table, the business has already been aware of the impact on the process and have already decided whether they want to keep the old process or are welcoming change on the process."*

> *"...in terms of the planning activities as set out, we will then determine what the project would entail. If it's a new technology that's getting implemented, we do a diagnostic, in respect of implications of new technology to existing processes, existing people capabilities, existing systems."*

> *"...in the proposal stage, at business case stage, someone would have to map out the implications on processes, systems, downtime - before the decision gets made. […] So that needs to be set upfront so that people are aware of what's happening, exactly what the changes, how they'll be affected and how long it's going to take."*

Change agility

Two respondents highlighted the significance of the organisations' **change agility** (change dexterity, appetite for change and speed of implementing change) in driving the change required when technologies are implemented:

> *"And even though we moved to digital in certain instances, some areas will not accept that [….] I do think in certain instances we don't transition seamlessly."*

Change management process

An expert highlighted the significance of the change being done throughout the implementation process, including communication:

> *"It has to go hand in hand with the implementation of the technology. And what I think good change management does is communicates well […] it's all-around communication […] you need to be able to communicate it well [...] It's almost walking hand in hand throughout the process to see what's been done, see what the impact is, to communicate that impact."*

How is the impact of the new technology measured and tracked, and what measures are used to determine whether the introduction of the new technology has been a success or not?

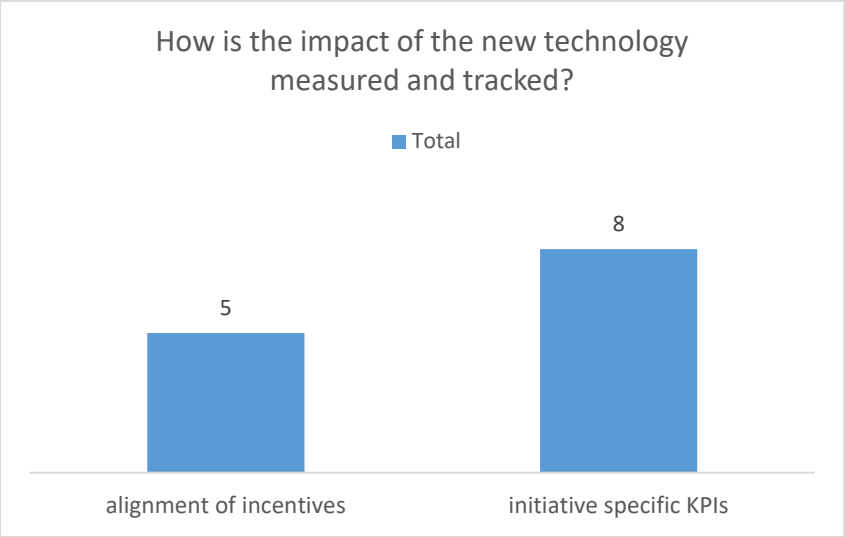

Figure 13: Impact measurement and tracking of technology implementations

Key themes with respect to the measurement and tracking of implemented technologies are:

Initiative specific KPIs

Most respondents highlighted that generally, **project or initiative specific KPIs** were in place but highlighted some challenges in the consistency of measuring actual performance or output against them:

> *"All initiatives {have} executive sponsorship. And for each of these initiatives, we've got quite agile charters, with very dynamic action plans and deliverables based on output [...] We've got very tangible KPIs that we've set to drive these things."*

> *"…we try very hard in our business cases and business requirements, to outline what the benefits are, and how those benefits should be tracked. [...] because of the maturity, sometimes these measurements are defined, but are not necessarily enforced during the operationalisation of the technology that would have been introduced, making it difficult sometimes to ascertain for sure whether benefits are being necessarily realised."*

> *"We do have project KPIs, and those project KPIs would give us a level of success."*

> *"No, it's not properly measured. But when new technologies are implemented, it is monitored, and the uptake and usage is essentially tracked. But I don't think there is a proper before and after picture that's painted [….] So, with some of those projects, yes, that's measured […] But in terms of other applications, and other transformation - I don't think so."*

> *"...do we go back and say, the business case, in relation to this introduction of this technology, have we reaped those benefits? […] whether they were quantitative or qualitative benefits?"*

Alignment of incentives:

Five respondents highlighted the challenges with regards to the consistent and diligent measuring and tracking of the impact of implementing technologies within their organisations:

> *"So that's something that's poor. [….] We do have processes in place […] we fail in implementing some of them because it gets overtaken by one or two other things that seem to take priority."*

“There’s just too much happening, and those don't necessarily happen. [...] But at the moment, I think that process had stalled.”

“I think what happens is more incidental because […] it's an outcome of either complaints or compliments almost on an ad hoc basis. But it's not a formal thing.”

“There's no one dedicated to measuring the impact, etc. […].”

4.3 SUMMARY

Following a thematic analysis approach, themes were coded based on the data collected from the interviews conducted. Participants included employees from the DFIs who subjects of this study as well as experts in the field of digital transformation. The respondents collectively had more than 3 years of experience working in development finance. The data was results were arranged in accordance with the research questions. Interview questions were mapped to research questions as stated in chapter 3 above, and data results were presented according to each interview question mapped to the research questions.

The data were grouped by similar concepts mentioned by respondents and using Microsoft excel to group these into themes. Through an iterative process, the concepts were grouped into themes, which were presented in graphs that represent the count of the number of times the themes were mentioned by the respondents. Quotes supporting the identified themes were extracted and presented. The themes summarise the responses, and inferences were drawn to develop the themes (i.e., the words were not necessary used by respondents, but the theme is inferred).

Chapter 5 discusses the findings from the data presented in this chapter in conjunction with the conceptual framework and propositions developed from the literature review conducted.

CHAPTER 5: ANALYSIS AND DISCUSSION OF THE RESEARCH FINDINGS

5.1 INTRODUCTION

This chapter discusses the analysis of the findings from Chapter 4 in conjunction with the conceptual framework developed from the literature reviewed conducted. The analysis is organised by research question and is examined against the propositions put forward in Chapter 2 to determine whether the key findings validate those propositions.

5.2 Discussion pertaining to Research Questions

5.2.1 Research Question 1: Discussion

How do DFIs manage their digital transformation strategies?

Research Question 1 was intended to establish how DFIs manage their digital transformation strategies by establishing how digital transformation is understood in the context of DFIs and what informed this understanding before exploring the enablers and constraints associated with the successful execution of digital transformation strategies.

For purposes of this study, digital transformation has been defined as the strategic management of change in an organisation, involving technology-enabled process optimisation, structural reform and digital capability development based on the literature review conducted (Henriette, Feki, & Boughzala, 2015; Reis, Amorim, Melao, & Matos, 2018; Stief, Eidhoff, & Voeth, 2016; Westerman, Bonnet, & McAfee, 2014). Based on the data collected from the interviews, the understanding of how digital transformation was defined in DFIs was generally aligned to the literature review conducted.

All respondents from the DFI subjects of this study emphasised that digital transformation was associated with technology-enabled process optimisation. There was an emphasis on the significant role that technology plays in achieving the respective organisations' digital transformation objectives. In their comprehensive

literature review, Reis, Amorim, Melao, & Matos (2018) confirm the significance of the role that technology plays as part of the strategic management practices in achieving digital transformation. The role of technology has been associated with optimising processes, ways of work and enabling more precise data-driven decisions through digital capability development (Westerman, Bonnet, & McAfee, 2014). Respondents emphasised the role of technology to be automation, changing process and generating value from the technology implementation for digital transformation. The importance of selecting the appropriate technology and the complementary relationship between the technology and users was highlighted. In their study, where they propose a flow model for understanding digital transformation, Verhoef et al. (2019) state the phases of digital transformation comprise *digitisation* (using technology to store, process and share information from previous analogue fashion), *digitalisation* (using technology to effect process improvements and enhancing user and customer experiences) and *digital transformation* (organisation-wide/strategic change that leads to new business models as a result of implementing/adopting digital technologies leading to changes in value creation activities) (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019).

Respondents further added that digital transformation was associated with developing digital capabilities, which were described as capabilities enabling efficiency in operations and promoting a competitive edge. In their comprehensive literature review of digital transformation, Henriette et al. (2015) describe digital capabilities as a proxy for IT capabilities which are described as *"the application of physical or intangible IT resources such as technology, knowledge, practices, relationships, management skills, business process understanding and human resources to further organizational goals"* (Sandberg, Mathiassen, & Napier, 2014).

Respondents also confirmed that digital transformation was associated with business model transformation or business model innovation, being the end-to-end transformation of the business model (Stief, Eidhoff, & Voeth, 2016). In their study, Westerman, Bonnet and McAfee (2014) identify business models as a key area that needs to be transformed as part of the building blocks of digital transformation. In order to achieve this transformation, traditional businesses need to be augmented with digital offerings, creating new digital businesses and the globalisation of organisations (Westerman, Bonnet, & McAfee, 2014; Reis, Amorim, Melao, & Matos, 2018). In a study that highlighted the rationale for organisations to undergo structural

reconfiguration, changes in technology or product innovation prominence were emphasised as contributors towards business model transformations (Carroll & Karim, 2009). In the case of this study, the business model transformation was associated with the adoption of technologies as part of the organisations' digital transformation strategy.

Digital transformation was also defined as the strategic management of change in response to external and internal factors (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019). Respondents described the digital transformation as processes and practices to enhance the organisational strategy through the use of technology, emphasising that digital transformation was associated with strategic renewal/change. Innovation is described as the strategic considerations and management processes associated with managing the implementation of strategic change, based on the definition of innovation by Gault (2018). Therefore, digital transformation forms part of the process and outcomes of innovation management in an organisation.

Although the definition and understanding of digital transformation correlated between the literature review findings and interview respondents, challenges specific to DFIs were highlighted. These included translation of the strategy into practical execution due to path dependency created by the success of legacy strategies, lack of convergence by the organisation to execute on the strategy and the culture resultant from the digital maturity level of the organisation. The largest barrier respondents identified to achieving digital transformation in DFIs was attributed to the digital maturity level of the organisation. Most respondents who made this attribution rated the digital maturity within DFIs as lower than average and thus constrained or slowed the progress of the digital transformation journey as a result of restrictive culture attributes or lack of convergence on the understanding of the benefits of digital transformation. The digital maturity of an organisation plays a critical role in stimulating other activities that promote digital transformation, such as a culture that promotes experimentation and continuous learning, led by a leadership workforce that has an entrepreneurial orientation (Warner & Wager, 2019).

5.2.2 Research Question 1.1: Discussion

What is the role of dynamic capabilities in enabling digital transformation?

Research Question 1.1 was intended to establish the role of dynamic capabilities as the strategic management capabilities that enable and manage digital transformation. The literature review explored studies that provided empirical evidence of the relationship between dynamic capabilities and digital transformation; where digital technologies were found to be correlated to dynamic capabilities micro-foundations (Mendonca & Andrade, 2018) and the dynamic capabilities required to be developed to manage strategic organisational change (digital transformation) (Warner & Wager, 2019). The proposition developed from the review indicates the role of dynamic capabilities in enabling digital transformation involves the strategic management of organisational change, including managing technology-enabled process optimisation, business model transformation and digital capability development.

According to the respondents, key themes of enablers of digital transformation included a digital mindset, management consensus and buy-in, strategy alignment, digital skillset and change agility:

<u>Digital mindset</u>

Based on the interview findings, building a digital mindset was identified as the main enabler of digital transformation. A digital mindset is characterised by a workforce that is entrepreneurially orientated to continuously seek opportunities and create value through various forms of analysis, experimentation and learning; and forms the micro-foundations of digital sensing capabilities (Warner & Wager, 2019). Respondents highlighted the importance of the role of leadership in developing a digital mindset and promoting that culture to the rest of the workforce. The findings indicated that the development of a digital mindset in DFIs was at its early stages, as the leadership had started developing the capability and driving that culture throughout the organisations. A study conducted evidenced how various training interventions of leadership groups fostered a culture of innovation and corporate entrepreneurship in DFIs and resulted in an increase in the development and approval of new venture opportunities (Van Vuuren, Groenewald, & Gantsho, 2009).

Management consensus/buy-in

All respondents highlighted the significance of their senior leaderships' convergence towards the success of the digital transformation. However, it was indicated that although there was management buy-in and consensus, there were challenges regarding the active sponsorship and driving of execution of the digital transformation strategies. This has slowed the execution progress of these strategies in comparison to desired progress. In their study on how incumbent organisations develop dynamic capabilities for digital transformation, Warner and Wäger (2019) emphasise the development of transformational leadership to champion the unlearning of traditional practices in order to improve the digital maturity of the organisation. They highlight the importance of executive support as an enabler of building dynamic capabilities for digital transformation (Warner & Wager, 2019).

Literature on the antecedents of dynamic capabilities stated that dynamic capabilities were enabled by the ability (skills, experience and willingness) of management to embrace change and promote continuous improvements in operational routines (Eriksson, 2014; Helfat, et al., 2007).

Digital roadmap

The process of developing a digital roadmap from the DFI's strategy was identified by respondents as an enabler of digital transformation. The digital roadmap articulates the implementation plan, which highlights the success factors of the digital transformation strategy, actions to be taken, roles and responsibilities. Respondents confirmed the existence of a digital roadmap that was developed from their respective DFIs' strategies; however, the robustness and responsiveness to emerging trends and market changes were identified as a process still in its early stages (i.e., existed mostly at a superficial level and was rigid).

In their study, Warner and Wäger (2019) indicated the development of strategic agility and digital scenario planning were foundational to building digital seizing capabilities; to allow for organisations to be more responsive to emerging trends and market changes.

Strategy alignment

Strategy alignment emerged as a theme in enablers of digital transformation. Respondents highlighted that in the context of their respective organisations, this element was either missing, being driven incorrectly by technology partners only or happened haphazardly. The literature reviewed on dynamic capabilities stated organisational adaptability foundational to the development of dynamic capabilities (Teece, 2007). This is categorised by the fit between strategy, culture and processes within the organisation.

Digital skillset

Respondents identified the importance of having the right skill set to drive and execute the digital transformation strategy of an organisation, highlighting that this skill set existed in pockets in their respective organisations, thus slowing the progression of the digital transformation journey of the organisation. In their study of antecedents of dynamic capabilities, Eriksson (2014) states having the appropriate mix of resources is foundational to building dynamic capabilities. The literature further highlighted that for the execution of the digital strategy, transformational capabilities were required to realise the full potential of strategic change (Warner & Wager, 2019).

In their studies, Mendonca and Andrade (2018) explore the relationship between digital capabilities (IoT, Big Data and AI) and dynamic capabilities micro-foundations. This study demonstrated the role of digital capabilities as part of dynamic capabilities activities as part of digital transformation in organisations (Mendonca & Andrade, 2018).

Change agility

The change agility of the organisations impacted how digital transformation is executed. The change agility was highlighted by respondents as something that needs to be in place and not necessarily something that was in place in the DFI context.

Change agility is characterised by the speed of an organisation to respond to external drivers (Fallon-Byrne & Harney, 2017; Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019). Dynamic capabilities are characterised by the continuous adaptability in response to changing competitive environment or gaining competitive advantage

(Winter, 2003; Pisano, Shuen, & Teece, 1997; Teece, 2007) – which speaks to the change agility of an organisation.

5.2.3 Research Question 1.2: Discussion

How does the diffusion of technological innovations enable digital transformation?

Research Question 1.2 is intended to establish how the diffusion of technological innovations promotes or detracts from achieving digital transformation in DFIs by considering the process of operationalising the digital transformation strategies, specifically, the considerations in selecting and implementing technologies. In section 5.2.1 above, it was determined that digital transformation is characterised by technology-enabled process optimisation. In a paper articulating strategic questions and responses for managers to consider in formulating a digital transformation, digital transformation is described - *"Digital transformation is concerned with the changes digital technologies can bring about in a company's business model, which result in changed products or organizational structures or in the automation of processes."* (Hess, Matt, Benlian, & Wiesböck, 2016).

It was proposed (Proposition 2) that the diffusion of technological innovation enables digital transformation through the adoption and implementation of technology, and related process and structural changes. For purposes of analysing the interview findings in relation to innovation diffusion, emerging themes were correlated to the factors that influence innovation diffusion (Rogers, 1995).

With regards to the operationalisation of the digital transformation strategies, the predominant theme that emerged from the interview respondents was the establishment of adequate governance and support for execution. Specifically, for DFIs, these included the establishment of steering committees, oversight and monitoring by the executive committee and specific executive sponsorship. This governance and support promoted the continued execution of the digital transformation. Innovation diffusion studies cite top management commitment towards

driving the diffusion process as critical to the success of the diffusion process (Wu, Zsidisin, & Ross, 2007).

In addition to governance and support, the formulation of specific strategic projects/initiatives emerged as a theme from the interview findings. These projects or initiatives include detailed implementation plans, including technology considerations. The review of current technology architectures was important to inform subsequent investment decisions into technologies as part of the implementation of initiatives. In the context of DFIs, these reviews were underway, as the organisations were at the infancy stages of their implementation journeys. Digital assets in the form of digital technologies (IoT, robotics, AI, etc.), developing digital agility through combining digital assets and other organisational resources to change the way of doing business as well as developing digital growth strategies through low-cost digital platforms and product differentiation are strategic imperatives for digital transformation (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019). The formulation of specific projects/initiatives as described by respondents has enabled the progression of the digital transformation journey through the identification of digital platforms to be developed and the digital resources required.

Based on the findings, challenges experienced related to the approach to implementation being inhibited by the siloed ways of work and lack of coordination and change management to stimulate progressive execution. In his later work on influences of the rate of diffusion in organisations, Rogers highlighted the structural characteristics of organisations that influenced the rate of diffusion where he stated that the initiation of the innovation diffusion process was better facilitated through structures with distributed decision-making and control, high concentration of specialised capability and less rigidity of business rules (Rogers, 2003).

Findings related to the considerations informing technology investment decisions in DFIs included the following themes:

- Research and benchmarking activities were performed by those charged with technology implementation, which mostly comprised the IT/ICT function in the organisation. These activities included research obtained from external parties (e.g., research with external research institutions) and benchmarking with other

DFIs within South Africa as well as internationally. The research extended to emerging technology trends in the financial services industry.

- On the back of the formulation of strategic initiatives as part of digital roadmap activities, diagnostics were performed to identify the gaps in the technology required to effect digital transformation and determine the level of technology investment required.
- The determination of technology investments required was informed by alignment to the overall corporate digital transformation strategy, gap analyses performed, and emerging trends based on research performed. Considerations with respect to choosing and implementing the appropriate technology solutions were informed largely by the resource mix or level of co-specialisation required. This referred to the strategic fit of the specific technology, which was meant to be a complementary asset to the existing human capability.

In his analysis of the construct of innovation decisions, Rogers (2003) highlights that an organisation's innovativeness and thus rate of diffusion is influenced by the type of innovation-decision; the more decisions are made collectively throughout the organisation, the more effective the rate of diffusion (Rogers, 2003). From the responses in this study, there was an acknowledgement of the establishment of appropriate decision-making governance (Steering Committees) to ensure the appropriate technologies were selected.

5.3 Discussion pertaining to Research Question 2

5.3.1 Research Question 2.1: Discussion

What are the seizing dynamic capability factors that influence technology innovation diffusion?

Research Question 2.1 is intended to understand the seizing dynamic capabilities that influence innovation diffusion. The findings were analysed in conjunction with the micro-foundations for building seizing capabilities for digital transformation and considerations in relation to the innovation diffusion process.

It was proposed (Proposition 3) that seizing dynamic capabilities micro-foundations that influence innovation diffusion were rapid prototyping, balancing digital portfolios and strategic fit enabled by organisational change, decision-making and leadership capabilities factors.

The following micro-foundations to building digital seizing capabilities have been determined in the literature review conducted (Warner & Wager, 2019):

- Rapid prototyping: Development of a digital mindset through decentralised execution structures for quicker responses to emerging opportunities and systematically managing uncertainties using digital scenario planning capabilities
- Strategic agility: The development of decentralised executions structures dedicated to breaking challenges of path dependency which often inhibit incumbent organisations from taking advantage of emerging opportunities
- Balancing digital portfolios: To allow for the scaling of emerging opportunities, new business models must be balanced with existing business models.

The following emerging themes relevant to routines associated with introducing new technologies were found:

- The culture within the DFIs was gradually evolving to promote the development of a digital mindset and ideation as this was recognised as an enabler of identifying opportunities for technological innovations.
- The implementation approach to introducing technological innovations involved the creation of partnerships and sequenced activities of performing diagnostics, developing business cases and detailed implementation plans.

  Respondents highlighted the challenges of having the right skillset - although there were dedicated functions tasked with the implementation, the complementary skillset remained a challenge. Furthermore, inconsistencies in following the approaches developed hindered the progress of technology implementation.
- As digital strategies matured in the organisations, so have the alignment of the technology selection and implementation considerations to the overall corporate strategy.

Respondents highlighted the determinants of organisational change for digital transformation to largely be:

- The strategic fit between people, process and technology elements,
- The level of change determined by change and impact assessments conducted and
- The level of leadership consensus and buy-in of the corporate digital strategy, which has evolved significantly in recent times as the urgency to digital transform DFIs, has become more pronounced.

Findings reveal the technology investment decision-making was largely determined by cross-functional governance committees based on business cases developed. This evolved in recent years from a process that relied solely on the IT/ICT function to make technology investment decisions. This has enabled stronger strategic alignment of technologies implemented to the strategic objectives of the digital strategy.

The literature review highlighted that although state-owned entities were advantaged to exposure to new technologies, the rate of diffusion was slowed by rigid management structures and hierarchical decision-making, as well as the incentive to adopt these technologies created by path dependency of legacy strategies (Fisher-Vanden, 2003). The findings above validated the literature review observations.

Digital seizing dynamic capability micro-foundation	**Theme Identified**	**The innovation diffusion process phase impacted**
Rapid prototyping	Development of digital mindset and promotion of ideation	Redefining/restructuring: The promotion of ideation and developing a digital mindset has positively influenced the design, testing and implementation of technology innovations
	The implementation approach fosters action to be taken on opportunities identified; challenges prevail related to skillset complement.	
	Management consensus and buy-in, which has evolved, has accelerated the promotion of developing a digital mindset.	Agenda setting: The convergence of management consensus has positively influenced the identification and drive to execute on opportunities identified

Balancing digital portfolios	Having cross-functional capabilities making the technology investment decisions to better manage the balancing of digital portfolios	Matching: Dedicating cross-functional capabilities and decentralising the decision-making has positively influenced the matching phase of the diffusion process
Strategic agility	Digital strategies evolved as strategic alignment was refined, demonstrating improved agility in responding to emerging opportunities.	Matching: As strategic alignment became sharper, this has positively influenced the determination of specific innovations to diffusion and thus the matching phase of the diffusion process.
	Change agility of DFIs remained lagging due to hierarchical decision-making structures and lack of incentive to transform created by path dependency of legacy strategies.	Previous hierarchical and concentrated decision-making has negatively impacted the innovation-decision process.

Table 4: Seizing dynamic capabilities that influence technological innovation diffusion

5.3.2 Research Question 2.2: Discussion

What are the reconfiguring dynamic capability factors that influence technology innovation diffusion?

Research Question 2.2 is intended to understand the reconfiguring dynamic capabilities that influence innovation diffusion. The findings were analysed in conjunction with the micro-foundations for building reconfiguring capabilities for digital transformation and considerations in relation to the innovation diffusion process.

It was proposed (Proposition 4) reconfiguring dynamic capabilities micro-foundations that influence innovation diffusion are navigating innovation ecosystems, redesigning internal structures and improving digital maturities enabled by organisational structure, organisational adaptability, absorptive capacity and culture.

A study conducted to determine how incumbent organisations build dynamic capabilities for digital transformation determined the following micro-foundations to building digital transforming[1] capabilities (Warner & Wager, 2019):

- Navigating innovation systems: The ability of incumbent organisations to join ecosystems that accelerate the development of transformational capabilities (i.e., developing entrepreneurial orientation)—also, entering into partnerships that foster investment into new business models.
- Redesigning internal structures: review and redesign of the incumbent's business model through interventions such as decentralisation of operating structures, distributed decision-making and rewiring of traditional practices.
- Improving digital maturity: Promoting culture and leadership change through various interventions such as hiring "digital natives" and transitioning the existing capabilities towards continuous improvement and an entrepreneurial mindset.

Interview respondents confirmed that changes to processes and capabilities result from technology implementations were identified during the planning phase of the implementation process as business cases were developed. These impact assessments determine the extent of business model changes required and should inform change plans to be executed during the implementation stages by a change management capability.

According to the majority of respondents, the existence of a change management capability was highlighted as the main driver of effective changes resultant from technology implementation to achieve digital transformation. Interestingly, the lack of a dedicated change management capability and clearly defined change process were identified as the main inhibitors of transformational change in DFIs. The change management capability was either concentrated on managing technology changes only or outsourced on an ad hoc basis to external service providers. This impacted the extent and subsequent impact of change required from the technology implementation.

[1] Proxy for reconfiguring. For purposes of this study, transforming and reconfiguring dynamic capabilities are used interchangeably

Respondents confirmed that although key performance indicators were developed during the planning stages of technology implementation journeys, the consistent measurement and tracking of performance remained a challenge. This was attributed to lack of capacity, misalignment of incentives to maintain continuous monitoring and measurement and competing priorities—this significantly impacted visibility of success factors or opportunities to improve with respect to the implemented technologies.

This inconstancy in measuring and tracking impacted the organisation's absorptive capacity to be able to integrate these outcomes and promote the discovery of new knowledge based on the implementation outcomes (Cohen & Levinthal, 1990). This has further stifled the ability for continuous improvement, thus stifling improvement of their digital maturity.

Digital reconfiguring dynamic capability micro-foundation	**Theme Identified**	**The innovation diffusion process phase impacted**
Navigating innovation systems	Through technology implementation partners, the organisations are able to successfully implement technologies; however, there was a lag in the participation in wider innovation systems.	Redefining/restructuring: The lag in participation in wider innovation systems has negatively impacted the organisational adaptability required when technology innovations are introduced. Thus, resulting in insignificant improvements in business models
Redesigning internal structures	There was little indication of transformational changes to existing structures associated with the implementation of new technologies.	Clarifying: Embedment of changes resultant from implementing technologies is not fully achieved and has slowed the progress of achieving transformational change.
	Although changes to processes and capabilities were identified during the planning phases, the lack of a focused change management capability negatively impacted the full-scale implementation of the required change.	Clarifying: The lack of change management capability has slowed the evolution of the culture of the organisation towards embracing change.
Improving digital maturity	The digital maturity has been negatively impacted by the lack of change management to effect the	Routinising:

	transformational change needed to accelerate the culture of continuous improvement and strategic renewal from lessons learnt (as a result of the measurement outcomes of the technology implemented)	Technological innovations are not fully embedded and, as a result, have slowed the improvement of the organisations' digital maturity.

Table 5: Reconfiguring dynamic capabilities that influence technological innovation diffusion

5.4 SUMMARY OF THE DISCUSSION

Globally there has been a growing trend in organisations developing digital transformation strategies to respond to changing competitive landscapes, consumer behaviour patterns and the emergence of disruptive technologies (PwC, 2021). This study seeks to explore dynamic capabilities that influence the diffusion of technological innovations to achieve digital transformation in South African DFIs.

Based on the literature reviewed, digital transformation has been summarised as the strategic management of change in an organisation, involving technology-enabled process optimisation, structural reform and digital capability development. Respondents of the study emphasised the significant role technology plays in digital transformation through automation, process optimisation and value generation from the implementation of technology. Respondents further added that digital transformation was associated with developing digital capabilities and business model transformation and was positively correlated to the process and outcomes of innovation management within the respective organisations. The respondents highlighted challenges experienced with digital transformation in DFIs included rigidity in the strategy execution and culture due to path dependency created by the success of legacy strategies and digital maturity levels of the organisations.

From the literature review, it was proposed that dynamic capabilities are the organisational capabilities that manage strategic change (digital transformation) in an organisation in response to changing competitor landscape. Key themes of enablers of digital transformation included developing a digital mindset, attaining management consensus and buy-in, ensuring strategy alignment, developing a digital skillset and

change agility. These attributes correlate to the micro-foundations to developing dynamic capabilities for digital transformation.

With regards to the operationalisation of digital transformation strategies, respondents highlighted the significance of adequate governance and support in the form of dedicated committees and executive sponsorship. This sponsorship then drove the development of project-specific initiatives the included detailed implementation plans, including technology investment decisions. The progress, however, has been hampered by siloed ways of work and lack of coordination and change management to stimulate progressive execution, synonymous with attributes highlighted in Rogers' innovation diffusion theory. Based on the findings, the processes of technology selection, adoption and implementation are critical to digital transformation, and in DFIs are managed appropriately by adequate governance structures, development of strategically aligned digital roadmaps and research and benchmarking activities.

With regards to seizing dynamic capabilities the influence innovation diffusion, the findings confirmed the existence of the micro-foundations of establishing a prototyping capability from the development of a digital mindset, the implementation approach and management convergence towards driving the digital transformation agenda. These impacted the initiation phase of the innovation diffusion process. The teams that are driving the technology investment decisions comprised cross-functional team members, which influenced the matching phase of the diffusion process. Strategic agility in DFIs remained an evolving capability in response to taking advantage of emerging opportunities as the change capability matured.

With regards to reconfiguring dynamic capabilities the influence innovation diffusion, micro-foundations explored included the examination of DFIs roles in innovation systems, redesigning of internal structures and improving digital maturity. Findings determined that digital maturity was negatively impacted by the lack of change management capabilities in DFIs. The lack of change management capabilities further negatively impacted full implementation and structural and business model transformation, despite the intention being developed during the conceptual phases of the digital transformation journey.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

Digital transformation is described as an ongoing process of strategic renewal, characterised by technology-enabled optimisation, business model transformations and digital capability development (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019; Westerman, Bonnet, & McAfee, 2014; Stief, Eidhoff, & Voeth, 2016). Literature reviews have indicated that incumbent organisations are triggered to embark on digital transformation journeys by increases in digital competitors, changes in customer needs and the emergence of digital technologies (Warner & Wager, 2019). Dynamic capabilities are those strategic management capabilities that facilitate organisational change (Ambrosini & Bowman, 2009) in response to rapidly changing environments. Innovation diffusion describes the process of technological innovations' adoption and implementation as well as effecting resultant organisational changes (Rogers, 2003).

This study set out to understand the influence of dynamic capabilities, specifically seizing and transforming dynamic capabilities, on the diffusion process of digital technologies for successful digital transformation in South African development finance institutions (DFIs).

The following research questions were asked, which the research conducted in this study sought to answer:

Research question 1:

1. How do DFIs manage their digital transformation strategies?

1.1 What is the role of dynamic capabilities in enabling digital transformation?

1.2 How does the diffusion of technological innovations enable digital transformation?

Research question 2:

2. What is the relationship between dynamic capabilities and innovation diffusion?

2.1 What are the seizing dynamic capability factors that influence technology innovation diffusion?

2.2 What are the reconfiguring dynamic capability factors that influence technology innovation diffusion?

The study sought to find the answers to the research questions above through conducting a rigorous literature review to develop a conceptual framework and put forward the following propositions:

P1: *The role of dynamic capabilities in enabling digital transformation involves the strategic management of organisational change, including managing technology-enabled process optimisation, structural reform and digital capability development.*

P2: *Diffusion of technological innovation enables digital transformation through the adoption and implementation of technology and related process and structural changes.*

P3: *The seizing dynamic capabilities micro-foundations that influence innovation diffusion are rapid prototyping, balancing digital portfolios and strategic fit enabled by organisational change, decision-making and leadership capabilities factors.*

P4: *The reconfiguring dynamic capabilities micro-foundations that influence innovation diffusion are navigating innovation ecosystems, redesigning internal structures and improving digital maturities enabled by organisational structure, organisational adaptability, absorptive capacity and culture.*

Data collected from interviews with employees of DFIs and experts working within fields relevant to the study were analysed in conjunction with the conceptual framework and propositions formed to find empirical evidence of the propositions or emergent propositions. This chapter summarises the findings of the study, makes recommendations based on the findings and proposes future research opportunities.

6.2 MAJOR FINDINGS AND KEY CONCLUSIONS OF THE STUDY

This section outlines the major findings from this study, arranged as responses to research questions posed at the beginning of the study:

Managing digital transformation strategies in DFIs: (Research Question 1)

The findings from the study confirm the relationship between dynamic capabilities and digital transformation; where digital transformation entails technology-enabled optimisation, building digital capabilities and business model transformation (Verhoef, Broekhuizen, Bart, Bhattacharya, & Dong, 2019; Westerman, Bonnet, & McAfee, 2014; Stief, Eidhoff, & Voeth, 2016).

The technology adopted for digital transformation was associated with pioneering new ways of work, developing leaner processes and enabling more precise data-driven decisions. The importance of successful implementation of these technologies was highlighted as critical to achieving the outcomes of digital transformation. This success is dependent on the innovation diffusion process in place.

Dynamic capabilities are organisational capabilities associated with strategically managing change in a competitive environment (Teece, 2007). The dynamic capabilities theory is therefore associated with innovation management. Findings of the study indicated that digital transformation formed part of the process and outcomes of innovation management in an organisation; and, therefore, established the relationship between dynamic capabilities and digital transformation.

The role of dynamic capabilities in enabling digital transformation: (Research Question 1.1)

Based on the findings described, the role of dynamic capabilities in enabling digital transformation was established by identifying the contributory factors (antecedents) highlighted by interview respondents. These contributory factors include:

- Developing a digital mindset that promoted corporate entrepreneurship and stimulated new business model creation. The digital mindset was highlighted as a leadership drive imperative in order to promote convergence within the organisation. The existence of a digital mindset was found to still be at the early stages of development within DFIs.

- Active executive sponsorship impacted the rate of diffusion for digital transformation. Non-convergence of leadership was found to stifle operational activities involved in making technology investment decisions. Distributed decision-making, which the organisations had started adopting, proved to address this challenge, except where the digital skillset required may not have existed.
- Dynamic capabilities are characterised by the continuous adaptability of organisational practices. The DFIs were found to have slower organisational adaptability characteristics, a function of path-dependent legacy strategies that yielded historical successes but created change resistance within the organisation.

The role of diffusion of technological innovations in enabling digital transformation: (Research Question 1.2)

Based on the findings described, the innovation diffusion process attributes that enable digital transformation include the research and benchmarking of technology trends and opportunities; and establishing governance and support structures that manage the selection of appropriate technology for the organisation to adopt and implement. In the context of DFIs, research houses and peer reviews are conducted to identify trends. The establishment of governance and support structures has been an ongoing improvement as the digital mindset of the respective organisations has been evolving. Reviews of current technology infrastructures have been conducted or were underway in order to enhance already existing digital roadmaps.

Respondents confirmed they had experienced an improvement in the strategic alignment of the selection and implementation of technologies with the overall corporate strategies. The process has evolved from solely being informed by the IT/ICT functions' recommendations to being supported and managed by cross-functional capabilities through the formulation of specific project/initiatives. This has resulted in improvement in the selection, adoption and implementation of technologies that have moved the digital transformation aspirations forward.

The seizing dynamic capability factors that influence technology innovation diffusion: (Research Question 2.1)

The seizing dynamic capabilities micro-foundations that influenced the innovation diffusion process were identified as prototyping or piloting of used of various technologies, balancing digital portfolios and building strategic agility. Rapid prototyping was driven by the implementation approach to technology diffusion and driven by the evidenced improved leadership sponsorship. The minimal existence of an organisation-wide digital mindset still impedes the progress of digital transformation journeys as challenges of lack of change agility prevail.

The selection of technologies for purposes of digitisation or digitalisation is promoted by the existence of cross-functional capabilities that collectively review and decide on the appropriate technologies. This mechanism also ensures the risks associated with driving transformational change are balanced with reward from the technologies implemented.

The development of strategic agility of DFIs has been impeded by the traditional culture of previously hierarchal decision-making and structural restrictions associated with being state-owned and subject to restrictive regulations.

The reconfiguring dynamic capability factors that influence technology innovation diffusion: (Research Question 2.2)

The reconfiguring dynamic capabilities micro-foundations that influenced the innovation diffusion process were identified as navigating innovation systems, redesigning internal structures and improving the digital maturity.

DFIs have the opportunity to leverage their relationships and networks to participate in innovation ecosystems at local, sub-national and national levels in order to form partnerships that may give rise to new business models and other value creation activities.

There was little indication of transformational changes of internal structures in DFIs on the back of technology implementations. Although the required changes to processes and capabilities are adequately identified and allocated key performance indicators, respondents confirmed the subsequent measuring and tracking of the impact was inconsistent due to capacity challenges and competing priorities. This has impacted the organisation's absorptive capacity and subsequent continuous improvement required for transformational change.

6.3 RECOMMENDATIONS

Based on the research conducted in this study and the findings thereof, the following recommendations apply in a DFI context and other state-owned entities with similar organisational profiles that have embarked on or intend to embark on digital transformation journeys:

1. Strategic management of digital transformation objectives and execution:

This study explores the relationship between dynamic capabilities and digital transformation; based on the findings of this study, dynamic capabilities are those organisational capabilities that manage the process of strategic management associated with digital transformation. The main challenges highlighted in this study with regards to state-owned DFIs are leadership sponsorship, the organisation's absorptive capacity, culture and organisational adaptability. It is therefore recommended that these incumbent organisations invest in organisational culture shifts towards agile ways of work and building transformational leadership that steer the digital agenda.

Digital strategies need to be evolved to include impacts on the business model and the designing of renewed business models as part of the digital roadmap development. Ensuring the right skillset is executing the strategies, incumbents should employ mechanisms such as establishing "skunkworks" teams that are equipped with the adequate decision-making powers to execute the digital strategies.

2. **Building seizing dynamic capabilities for effective innovation diffusion:**

State-owned entities are often constrained by traditional hierarchical decision-making structures and rigid regulations that may stifle the agility required to drive the success of the digital transformation. Based on this study, incumbents can strengthen strategic agility capability through experimentation mechanisms such as innovation labs or spaces and using the outcomes to inform the direction the organisation should take or technologies to adopt to realise the digital strategy. The success of this is also dependent on decentralised decision-making; it is recommended that decision-making mechanisms are reviewed to distribute the decision-making to functions managing digital transformation and allowing them the flexibility in the execution (e.g. allowing them to enter into alternative arrangements such as outsourcing certain components)

Strategic planning cycles and the manner in which strategies are developed need to also be reviewed. Typically, strategic planning and review cycles are conducted annually; it is recommended that flexibility be built to allow for more frequent review cycles and scenario analysis to be adopted to ensure responsiveness to changing factors.

National development banks (such as DFIs) have the advantage of access to superior technologies through their networks and relationships with other state entities and departments. It is recommended that they utilise these relationships to explore digital capabilities that they can adopt or enter into partnerships to access for purposes of achieving their digital objectives.

3. **Building reconfiguring dynamic capabilities for effective innovation diffusion:**

Based on the findings, in incumbent organisations, change is planned for, but due to lack of a dedicated change management capability or inconsistency in driving change, relevant changes are not properly executed to really drive full value to be derived from

the implementation of technology for digital transformation. Respondents have confirmed low levels of digital maturity in DFIs have impacted experiencing transformational change associated with technology implemented as part of the digital strategies. Digital maturity can be enhanced through developing digital capabilities (recruiting new skills and upskilling the existing workforce). In accordance with a case study conducted, management in a DFI was subjected to various training interventions to develop management innovation and corporate entrepreneurial capabilities, and this resulted in an uptake in the development of new value-creating proposals (Gantsho, Groenewald, & van Vuuren, 2009). Similar interventions can be deployed in other DFIs and state-owned entities, driving the digital agenda.

It is further recommended that these incumbents leverage networks external to the organisation enable the building of new business models in parallel to the existing ones. This follows the open innovation concept of partnering with stakeholders who are part of innovation systems to develop certain innovative capabilities or value. DFIs that are wholly government-owned can benefit from the state's stakeholder network as well as networks across the development finance industry (including other state-owned entities, service provider networks, peer DFIs locally and internationally and Fintechs).

6.4 LIMITATIONS OF THE STUDY

The study was limited to two DFIs within South Africa with a similar profile and not all DFIs in South Africa. Twelve (12) of the interview participants comprised employees from these DFIs, and the assumption has been applied that responses provided were representative of aggregated views.

The findings were based on feedback from participant responses at a point in time and did not factor longitudinal or historical context views. The responses may have been impacted by other global conditions and events, such as the COVID-19 pandemic.

6.5 SUGGESTIONS FOR FUTURE RESEARCH

The study provided empirical evidence of the influence of seizing and transforming dynamic capabilities on the technological innovation diffusion processes, by considering their micro-foundations and examining their impact on various stages of the diffusion process. The research findings indicated that although micro-foundations for building digital seizing and transforming capabilities existed, their development would improve the digital maturity of DFIs significantly, accelerating the successful execution of their digital transformation strategies.

Based on the study, future studies considerations are highlighted below:

- An emerging gap within organisations that were subjects of this study related to the lack of organisational adaptability, which emerged as an inhibitor to the organisations change agility and new business model development. Opportunities exist to develop focused studies on organisational adaptability of state-owned entities such as DFIs given the regulatory environment, their respective mandates and other restrictions, which would stimulate their innovativeness;
- Innovation management within state-owned organisations for internal value creation that enables service delivery. The literature review revealed a focus on public service innovation but a lack of research that emphasised innovation management within state-owned entities to enable them to operate more effectively;
- Further empirical studies of each dynamic capability type (sensing, seizing and transforming) for digital transformation. Dynamic capabilities research, especially that linked to digital transformation, is an evolving field with many opportunities to present deep insights;
- Due to the lack of studies of the strategic management of change in state-owned entities such as DFIs in the context of fast-changing industry landscapes; comparative studies of the strategic management of digital transformation in DFIs across South Africa and comparatively to DFIs in other African states will provide further empirical evidence for management responses in these entities.

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Appendix A: Interview Schedule

TITLE: Building dynamic capabilities that enable effective diffusion: the case of DFIs in South Africa

Qualitative Research: Semi-Structured Interview

The purpose of this study is to understand the influence of dynamic capabilities on innovation diffusion when driving digital transformation in an organisation. The study aims to understand the influence of seizing and reconfiguring dynamic capabilities on the technological innovation diffusion process.

By completing the questions below, you agree to participate in this study. All information gathered from this research will be treated with complete confidentiality and anonymity. The data obtained will be stored in a secured and protected environment.

Kindly answer the questions below.

Section 1: Background information

1. Please state the name of the organisation?
2. What is your job title?
3. How many years have you been working in the development finance industry?
4. What is your role in relation to the digital transformation strategy of the organisation?

Section 2: Digital Transformation

5. What is your understanding of digital transformation?
6. What do you think needs to be in place to enable digital transformation?
7. How does the organisation operationalise its digital transformation strategy?

Section 3: Dynamic capabilities

I define dynamic capabilities as those capabilities associated with understanding an organisation's strategic position, making strategic choices and implementing those strategies through reconfiguration of the organisation's resources.

8. What routines (processes/systems) does your organisation have in place to enable it to successfully introduce new technologies?
9. How does the organisation assess, manage and respond to the impact on business models of selecting the adoption of technologies for digital transformation?
10. What factors determine the level of organisational changes required for the implementation of digital transformation strategy?

Section 4: Innovation Diffusion

I define innovation diffusion as the process of selecting technological innovations and implementing them within the organisation for purposes of obtaining competitive advantage (as part of the digital transformation strategy of the organisation)

11. What informs your organisation's decisions to invest in new technologies?
    a. How does your organisation decide to explore new technologies?
    b. What considerations are made with regards to choosing an appropriate technology?
12. Who is part of decision-making with regards to investment in new technologies?
13. How are changes to processes and capabilities as a result of the implementation of the new technology determined and resolved?
14. How is the impact of the new technology measured and tracked, and what measures are used to determine whether the introduction of the new technology has been a success or not?

Appendix B: Participant Consent form

The following consent form was signed by interview participants:

Consent Form

Title of the Project: Building dynamic capabilities that enable effective diffusion: the case of DFIs in South Africa

Name of the Researcher: Itumeleng Dlamini

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 (please circle)	YES	NO
I agree that the researcher may use anonymous quotes in her 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 C: Participant Information sheet

Wits Business School
Graduate School of Business Administration
Master of Management in the field of Innovation Studies
2 St David's Pl & St Andrews Road, Park town, Johannesburg, 2193
TEL / FAX: 011 717 3600 / 011 717 3514
Website: www.wbs.ac.za

Dear Participant,

I am a student at the Wits Business School studying towards the Master of Management in the field of Innovation studies (MMIS). As part of the Master's programme, I am required to conduct a comprehensive research study in order to meet all the requirements.

The purpose of the study is to explore the relationship between dynamic capabilities and the diffusion of technological innovations that enables successful digital transformation in a South African development finance institution (DFI) context. It seeks to explores the impact that seizing and transforming dynamic capabilities have on the innovation diffusion process, specifically, how these dynamic capabilities influence the diffusion process as the DFI undertakes digital transformation within the organisation.

In order to conduct the study, I will interview knowledgeable individuals regarding the digital transformation strategies and activities and that are actively working within a DFI. You have been recognized as a suitable individual to provide information regarding this study. I would like your approval to interview you regarding the study.

The estimated time for the semi-structured interview is 60 minutes and will be conducted in the manner that you are most comfortable with. Your contribution, time and feedback would be appreciated. All information collected from this study will be confidential, anonymous and the data obtained will be stored in an environment protected with a username and password. I will get in contact with you to make an appointment for a suitable time.

Dr Mjumo Mzyece is the supervisor for this study, and in the event, you have any questions, you can contact him via email at mjumo.mzyece2@wits.ac.za.

Kind regards

Itumeleng Dlamini

Wits Business School, MMIS Student